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**B.Sc. (Part – I) (Semester – I) (ECS) Examination, 2016  
(CBCS Pattern) (New)  
Paper – I : ENGLISH (Compulsory)  
*On Track-English Skills for Success***

Time : 2½ Hours

Max. Marks : 70

**Instructions** : 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Rewrite the following sentences by choosing the correct alternative : 14
- 1) The poem ‘Bangle Sellers’ is written by \_\_\_\_\_
    - a) Sarojini Naidu
    - b) W. B. Yeats
    - c) Robert Hayden
    - d) O. Henry
  - 2) Which one of the following is a simile ?
    - a) Like the flame of her marriage
    - b) Unfair brow
    - c) Gold-flecked grey
    - d) Rainbow tinted circles of light
  - 3) The Irish airman is fighting in the war because of \_\_\_\_\_
    - a) A lonely impulse of delight
    - b) A sense of duty
    - c) Cheering crowds
    - d) Law
  - 4) \_\_\_\_\_ began to turn into the main criterion to reckon intelligence in our society.
    - a) EQ test
    - b) IQ test
    - c) Fitness test
    - d) None of the above
  - 5) The word ‘intelligence’ is derived from a \_\_\_\_\_ word.
    - a) French
    - b) English
    - c) Russian
    - d) Latin
  - 6) Miss Krishna talked endlessly of her \_\_\_\_\_
    - a) Sister
    - b) Brother
    - c) Mother
    - d) Father



- 7) The writer took \_\_\_\_\_ from Miss Krishna's trunk with the permission of her sister.  
a) A spoon      b) A glass      c) Fountain pen      d) Little clock
- 8) Jimmy Wells is a \_\_\_\_\_.  
a) Teacher      b) Postman      c) Sailor      d) Policeman
- 9) Jimmy and Bob decided that they will meet at Big Joe Brady's restaurant after \_\_\_\_\_ years.  
a) 30      b) 20      c) 25      d) 35
- 10) Last week, I met \_\_\_\_\_ European in Solapur.  
a) a      b) an      c) the      d) zero article
- 11) Amit is \_\_\_\_\_ tallest boy in the class.  
a) the      b) a      c) an      d) zero article
- 12) We will meet \_\_\_\_\_ Monday.  
a) off      b) of      c) at      d) on
- 13) Who is your Chemistry teacher ? The underlined noun is a \_\_\_\_\_ noun.  
a) collective      b) proper      c) common      d) abstract
- 14) The shop is \_\_\_\_\_ my flat.  
a) at      b) under      c) for      d) below

2. Answer **any seven** of the following questions :

14

- 1) Why did the narrator consider Miss Krishna an annoying guest ?
- 2) What is found in Miss Krishna's trunk ?
- 3) Why did Miss Krishna come to stay at narrator's house ?
- 4) What is the meaning of the term 'artificial intelligence' ?
- 5) In which areas does computer work faster than human beings ?
- 6) What are the myths regarding the intelligence of computers ?
- 7) How does writer describe Bob ?
- 8) What was the nickname for Bob that the plain-clothes policeman used ?  
What does it mean ?



3. A) Write short paragraphs on **any two** of the following : 8
- 1) Meaningful education.
  - 2) The importance of physical exercise
  - 3) Deforestation.
- B) Answer **any two** of the following questions briefly : 6
- 1) Examine the role of women in the poem ‘Bangle Sellers’ ?
  - 2) How does the poet describe the life of middle-aged faithful wife ?
  - 3) What is the Irish man’s attitude towards the war he is fighting in ?
4. Write an essay on **any one** of the following : 14
- 1) Benefits of meditation.
  - 2) Farmer’s suicides : Causes and solutions.
5. Read the following passage and make notes of it. Give an appropriate title for your notes : 14
- Money has various uses in the modern world : It is a measure of the value of goods and services, a means of exchanging such goods and services and in a way to store up buying power so that one can use it later.
- As a measure of value, it is of the very great use. If I work in the office, how can my employer know what to pay me for my services, if there is no generally recognised measure of value ? He may decide to pay me a certain number of loaves and bread each week. But then, I shall have to exchange some of those loaves for other things I need. Money gives us a very useful means of measuring such relative values. Money is also of great use as a means exchanging goods and services. I can consider it as a means of storing up buying power, and I find it, it has good and bad points. It can more easily be kept a long time than such things as food, which rots or buildings, which slowly fall to pieces or machines which rust. It takes up very little space and if you put it in a bank, it is safe as anything in this world can be.
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**B.Sc. – I (Entire Computer Science) (Semester – I) Examination, 2016  
(New CBCS)  
FUNDAMENTAL OF COMPUTER (Paper – II)**

Time : 2 Hours 30 Minutes

Total Marks : 70

***Instruction : All questions are compulsory.***

1. Choose correct alternatives : 14
- 1) To save a new text file \_\_\_\_\_ short cut key is used.  
a) Ctrl + Z                      b) Ctrl + O                      c) Ctrl + V                      d) Ctrl + S
  - 2) Mark-One Computer which was first fully automatic sequence controlled calculator designed by \_\_\_\_\_  
a) Attansoff – Berry                      b) Howard A. Aiken  
c) Dr. John Von Neumann                      d) Prof. J. Presper Eckert
  - 3) The second generations computers were manufactured using \_\_\_\_\_ instead of \_\_\_\_\_.  
a) vacuum tubes, transistors                      b) transistors, IC  
c) transistors, vacuum tubes                      d) none of the above
  - 4) \_\_\_\_\_ short cut key is used to play slideshow in MS-Powerpoint.  
a) F6                      b) F8                      c) F9                      d) F5
  - 5) \_\_\_\_\_ is the volatile memory of computer.  
a) RAM                      b) ROM                      c) Both a and b                      d) None of these
  - 6) \_\_\_\_\_ shortcut key is used to make underline to the sentences in MS-Word.  
a) ctrl+u                      b) ctrl+b                      c) ctrl+f                      d) alt+u
  - 7) \_\_\_\_\_ is not valid version of MS-office.  
a) Office-XP                      b) Office-Vista                      c) Office 2007                      d) None of these
  - 8) The access method used for magnetic tape is \_\_\_\_\_  
a) Direct                      b) Random                      c) Sequential                      d) None of the above

P.T.O.



- 9) SIMM (Single Inline Memory Module) holds the \_\_\_\_\_ onto motherboard.  
a) RAM                      b) ROM                      c) Both a and b      d) None of these
- 10) \_\_\_\_\_ device is commonly used to check the optical answer sheets in multiple choice question examination.  
a) MICR                      b) OBCR                      c) OMR                      d) Scanner
- 11) The print head of \_\_\_\_\_ printer contains tiny nozzles.  
a) dot-matrix                      b) laser printer  
c) ink-jet                      d) daisy wheel
- 12) \_\_\_\_\_ is known as father of Modern Digital Computer.  
a) John Von Neumann                      b) Blaise Pascal  
c) Garden Moorie                      d) Charles Babbage
- 13) \_\_\_\_\_ memory is also known as field store.  
a) ROM                      b) RAM  
c) CD (Compact Disk)                      d) DVD (Digital Versatile Disk)
- 14) \_\_\_\_\_ enables us to send the same letter to different persons.  
a) Macros                      b) Template                      c) Mail-merge                      d) None of these

2. Attempt **any seven** of the followings :

**14**

- 1) What is multiprogramming ?
- 2) What is memory ? List the basic types of memory.
- 3) List the non-impact printers.
- 4) List the Mobile Operating Systems.
- 5) What is EEPROM ?
- 6) What is the role of ALU unit in CPU ?
- 7) Write any four mathematical formulas of MS-Excel.
- 8) What is file ? List the attributes of file.
- 9) What is the default extension of MS-Excel file ?



3. A) Attempt **any two** of the followings :
- 1) What is joystick ? How joystick is different from mouse ? 5
  - 2) How the hyperlink tool from MS-word is useful ? Write the procedure of creating hyperlink. 5
  - 3) What are the advantages of ink-jet printer compared to dot-matrix printer ? 5
- B) Write a short note on EDVAC. 4
4. Attempt **any two** of the followings :
- A) What is Operating System ? What are the functions of Operating System ? 7
  - B) List the output devices. Explain the CRT monitor with figure. 7
  - C) Explain generations of computer briefly. 7
5. Attempt **any two** of the followings :
- A) What are the features of MS-Excel ? 7
  - B) What are point-and-draw devices ? Name some commonly used point-and draw devices. Explain light-pen with figure. 7
  - C) What is Computer ? What are the types of computer ? 7
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**B.Sc. (E.C.S.) – I (Semester – I) (New CBCS) Examination, 2016**  
**COMPUTER SCIENCE (Paper – III)**  
**Programming Using ‘C’**

Time : 2½ Hours

Total Marks : 70

**Instructions:** i) **All questions are compulsory.**  
ii) Figure to the **right** indicates **full** marks.

1. Choose the correct alternative :

14

- 1) What are the types of linkages ?
  - A) Internal and External
  - B) External, Internal and None
  - C) External and None
  - D) Internal
- 2) By default a real number is treated as a \_\_\_\_\_
  - A) Float
  - B) Double
  - C) Long double
  - D) Far double
- 3) Which of the following correctly shows the hierarchy of arithmetic operations in C ?
  - A) / + \* -
  - B) \* - / +
  - C) + - / \*
  - D) / \* + -
- 4) Which of the following is the correct usage of conditional operators used in C ?
  - A)  $a > b ? c = 30 : c = 40$
  - B)  $a > b ? c = 30;$
  - C)  $\max = a > b ? a > c ? a:c:b > c?b:c$
  - D)  $\text{return } (a>b)?(a:b)$
- 5) Char variable can at a time store \_\_\_\_\_
  - A) 4 character
  - B) 8 character
  - C) 1 character
  - D) None of these
- 6) Continue statement used for \_\_\_\_\_
  - A) To continue to the next line of code
  - B) To stop the current iteration and begin the next iteration from the beginning
  - C) To handle run time error
  - D) None of above

P.T.O.



7) What is right way to Initialize array ?

- A) `int num[6] = {2, 4, 12, 5, 45, 5};`
- B) `int n{} = {2, 4, 12, 5, 45, 5};`
- C) `int n{6} = {2, 4, 12};`
- D) `int n(6) = {2, 4, 12, 5, 45, 5};`

8) \_\_\_\_\_ is compulsory section.

- A) `main()`
- B) documentation section
- C) link section
- D) none of these

9) The function `scanf()` returns \_\_\_\_\_

- A) The actual values read for each argument
- B) 1
- C) The number of successful read input values
- D) 0

10) The type of the controlling expression of a switch statement cannot be of the type \_\_\_\_\_

- A) `int`
- B) `char`
- C) `short`
- D) `float`

11) Which of the following operator used as Ternary Operator ?

- A) `<=`
- B) `>=`
- C) `?:`
- D) `? =`

12) Which one of the following is not a valid identifier ?

- A) `_examveda`
- B) `1examveda`
- C) `exam_veda`
- D) `examveda1`

13) Which of the following operator takes only integer operands ?

- A) `+`
- B) `*`
- C) `/`
- D) `%`

14) Who is father of C language ?

- A) Bjarne Stroustrup
- B) James A. Gosling
- C) Dennis Ritchie
- D) Dr. E. F. Codd

2. Solve **any seven** of the following :

- 1) Define Flowchart.
- 2) Define Constant.
- 3) Syntax of `goto` statement.
- 4) Define identifier.





- 5) Define Pseudo Code.
  - 6) Write four data types of 'C' language.
  - 7) What is local variable ?
  - 8) What is size of operator ?
  - 9) What is keyword ?
3. A) Solve **any two** of the following : **10**
- 1) What is string ? Explain any five built in functions of string.
  - 2) Explain Symbols of Flowchart.
  - 3) Explain operators of 'C' language.
- B) Write a program to display number is even or odd. **4**
4. Solve **any two** of the following : **14**
- 1) Explain structure of 'C' program.
  - 2) What is Array ? Explain types of Array.
  - 3) Write a program to calculate addition of two matrix.
5. Solve **any two** of the following : **14**
- 1) Explain features or characteristics of 'C' language.
  - 2) What is Loop ? Explain iterative statement.
  - 3) Write a program to check given number is Armstrong or not.
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**B.Sc. (ECS) – I (Semester – I) (New) (CBCS) Examination, 2016  
LINEAR ELECTRONICS – I (Paper – IV)**

Time : 2½ Hours

Max. Marks : 70

- Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right place indicate full marks.*  
3) *Neat diagram must be drawn wherever necessary.*

1. Choose correct alternatives :

**14**

- 1) The emitter of transistor is \_\_\_\_\_ doped.
  - a) Lightly
  - b) Heavily
  - c) Medium
  - d) None of these
- 2) The unit of inductor is
  - a)  $\Omega$
  - b) Faraday
  - c) Henry
  - d) None of these
- 3) The colour code of  $220\Omega \pm 5\%$  is
  - a) Red Black Brown Gold
  - b) Red Red Black Silver
  - c) Red Red Brown Gold
  - d) Black Brown Red Silver
- 4) CMRR =
  - a) AC/AD
  - b) AD/AC
  - c) Both a and b
  - d) None of these
- 5) Output impedance of IC-741 \_\_\_\_\_  $\Omega$ .
  - a) Infinity
  - b) Zero
  - c) 75
  - d) None of these
- 6) The transistor has \_\_\_\_\_ junctions.
  - a) 2
  - b) 3
  - c) 4
  - d) 1
- 7) In N-type semiconductor \_\_\_\_\_ are majority charge carriers.
  - a) Hole
  - b) Electrons
  - c) Both a and b
  - d) None of these



- 8) \_\_\_\_\_ is the cutoff voltage of SI junction Diode.
- a) 0.7 eV    b) 0.3 eV  
 c) 0.1 eV    d) None of these
- 9) \_\_\_\_\_ energy band gap between Valence and Conduction band.
- a) 1 eV    b) 0 eV    c) 2 eV    d) None of these
- 10) Ripple factor for half wave rectifier
- a) 0.48    b) 0.24    c) 1.21    d) 2
- 11) Operating point in class-A amplifier is at \_\_\_\_\_ region.
- a) active  
 b) cutoff  
 c) saturation  
 d) between active and cutoff
- 12) Audio frequency range
- a) 20 Hz to 20 KHz    b) 30 Hz to 30 KHz  
 c) 30 KHz to 300 MHz    d) 20 KHz to 20 MHz
- 13) Conduction angle of class-B amplifier
- a) 360°    b) 180°  
 c) 180° – 360°    d) <120°
- 14) The closed loop gain of inverting amplifier is
- a)  $1 + R_f/R_1$     b)  $1 - R_f/R_1$     c)  $-R_f/R_1$     d)  $R_1/R_f$

2. Attempt **any seven** of the following :

14

- 1) State Ohm's Law.
- 2) What is semiconductor ? State its types.
- 3) Write note on Passive Components.
- 4) Define current and voltage gain.
- 5) Define amplifier.
- 6) Write note on Carbon Composition Resistor.
- 7) State Kirchhoffs Current and Voltage Law.
- 8) Write Parameter of Op-Amp.
- 9) What is meant by filter and state its different types ?



3. A) Attempt **any two** of the following : **10**
- 1) Explain Op-Amp as inverting amplifier with proper diagram.
  - 2) Write note on Zener diode as voltage regulator.
  - 3) Explain working of P-N junction diode.
- B) What is Rectifier ? Explain full wave rectifier. **4**
4. Attempt **any two** of the following : **14**
- 1) Explain classification of amplifier.
  - 2) What is meant by feedback system ? Explain block diagram of feedback system.
  - 3) What is capacitor ? Explain different types of fixed capacitor.
5. Attempt **any two** of the following : **14**
- 1) Define transistor. Explain different configuration in transistor with diagram.
  - 2) What is Inductor ? What are different types of Inductors ? Explain construction of Iron core Inductor.
  - 3) What is Op-Amp ? Draw and explain in brief block diagram of Op-Amp.
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**B.Sc. (ECS) – I (Semester – I) (New-CBCS) Examination, 2016**  
**DIGITAL ELECTRONICS – I (Paper – V)**

Time : 2 Hours 30 Minutes

Total Marks : 70

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Multiple choice questions : **14**

- 1) \_\_\_\_\_ octal equivalent of binary number 10111101.  
A) 675                      B) 275                      C) 572                      D) 573
- 2) \_\_\_\_\_ is the binary equivalent of the decimal number 368.  
A) 101110000              B) 110110000              C) 111010000              D) 111100000
- 3) \_\_\_\_\_ Flip-Flops are required for mod-16 counter.  
A) 5                          B) 6                          C) 3                          D) 4
- 4) The Gray code for decimal number 6 is equivalent to \_\_\_\_\_  
A) 1100                      B) 1001                      C) 0101                      D) 0110
- 5) The 2's complement of the number 1101101 is \_\_\_\_\_  
A) 0101110                  B) 0111110                  C) 0110010                  D) 0010011
- 6) In a JK Flip-Flop, toggle means \_\_\_\_\_  
A) Set Q = 1 and Q = 0  
B) Set Q = 0 and Q = 1  
C) Change the output to the opposite state  
D) No change in output
- 7) \_\_\_\_\_ select lines will a 16 to 1 multiplexer.  
A) 4                          B) 3                          C) 5                          D) 1
- 8) \_\_\_\_\_ of following are known as universal gates.  
A) NAND & NOR                      B) AND & OR  
C) XOR & OR                          D) None



- 9) The output of a logic gate is 1 when all its inputs are at logic 0. The gate is either \_\_\_\_\_
- A) a NAND or an EX-OR
  - B) an OR or an EX-NOR
  - C) an AND or an EX-OR
  - D) a NOR or an EX-NOR
- 10) The gates required to build a half adder are \_\_\_\_\_
- A) EX-OR gate and NOR gate
  - B) EX-OR gate and OR gate
  - C) EX-OR gate and AND gate
  - D) Four NAND gates
- 11) \_\_\_\_\_ AND gates are required to realize  $Y = CD + EF + G$ .
- A) 4
  - B) 5
  - C) 3
  - D) 2
- 12) In a positive logic system, logic state 1 corresponds to \_\_\_\_\_
- A) Positive voltage
  - B) Higher voltage level
  - C) Zero voltage level
  - D) Lower voltage level
- 13) The output of SR flip flop when  $S = 1, R = 0$  is \_\_\_\_\_
- A) 1
  - B) 0
  - C) No change
  - D) High impedance
- 14) A full adder logic circuit will have \_\_\_\_\_
- A) Two inputs and one output
  - B) Three inputs and three outputs
  - C) Two inputs and two outputs
  - D) Three inputs and two outputs

2. Answer **any seven** of the following :

14

- 1) Explain half subtractor.
- 2) Explain D FF with neat diagram.
- 3) Explain logic gates with logical symbol, truth table and logical expression.
- 4) State any two Boolean Laws.
- 5) Solve the following :
  - i)  $(110101)_2 + (101101)_2$
  - ii)  $(1010)_2 - (1000)_2$  using 1's complement method



- 6) Convert the following hexadecimal numbers to decimal :
- i) 2CH
  - ii) A9DH
- 7) Prove :  $A(1 + \bar{A}) = A$ .
- 8) Implement given logical equation using logic gates  $Y = AB + CD$ .
- 9) Convert the following decimal numbers into excess – 3 code.
- i)  $(7)_{10}$
  - ii)  $(45)_{10}$
3. A) Answer **any two** of the following : **10**
- 1) State and prove De Morgan’s theorem.
  - 2) Design a full Adder circuit.
  - 3) Draw the logical circuit diagram of clocked SR flip flop using NAND gates and describe its working with truth table.
- B) Simplify given SOP equation using K – Map technique
- $Y = \sum m (0, 1, 2, 3, 4, 5, 7, 12, 13, 15)$ . **4**
4. Attempt **any two** of the following : **14**
- 1) Explain 2:4 & 3:8 decoders with neat diagram and truth table.
  - 2) Design MOD 5 counter.
  - 3) What is encoder and explain priority Encoder ?
5. Attempt **any two** of the following : **14**
- 1) Explain 8:1 Multiplexer with diagram and draw diagram of 4:1 MUX using 2:1 MUX.
  - 2) Explain SISO & SIPO shift Register.
  - 3) Explain 3 bit asynchronous up counter and down counter with neat diagram.
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**B.Sc. (E.C.S.) – I (Semester – I) (New – CBCS Pattern) Examination, 2016**  
**MATHEMATICS (Paper – VI)**  
**Discrete Structures**

Time : 2½ Hours

Max. Marks : 70

- Instructions:** 1) *Use of scientific calculator is allowed.*  
2) *All questions are compulsory.*  
3) *Figures to the right indicate full marks.*

1. Choose the correct alternative :

14

- 1) If two or more edges have one of their end vertex in common then that edges are called as \_\_\_\_\_ edges.  
a) Parallel                      b) Loops                      c) Adjacent                      d) Symmetric
- 2) A graph  $G$  which contains both the parallel edges and loop is called as \_\_\_\_\_ graph.  
a) Pseudo                      b) Multi                      c) Regular                      d) Simple
- 3) For the simple graphs  $G_1(V_1, E_1)$  and  $G_2(V_2, E_2)$  the vertex set of the product graph  $G = G_1 \times G_2$  is  
a)  $V_1 \cup V_2$                       b)  $V_1 \oplus V_2$                       c)  $V_1 \cap V_2$                       d) None of these
- 4) A simple graph  $G$  is said to be \_\_\_\_\_ graph if it is isomorphic to its own complement.  
a) Complement                      b) Self complementary  
c) Self concentric                      d) Isomorphic
- 5) A walk in which \_\_\_\_\_ is repeated is called as path.  
a) Vertex                      b) No edge                      c) No vertex                      d) Edge
- 6) Let  $G$  be a connected graph then vertex 'V' of  $G$  is called cut vertex if the graph  $G - V$  is \_\_\_\_\_ graph.  
a) Connected                      b) Disconnected  
c) Regular                      d) Null
- 7) If a connected graph has 3 isthmus then its edge connectivity is  
a) 0                      b) 1                      c) 2                      d) 3
- 8) Chinese Postman Problem is a particular case of \_\_\_\_\_ graph.  
a) Eulerian                      b) Hamiltonian  
c) Both a) and b)                      d) Neither a) nor b)
- 9) A path which covers all the vertices of given connected graph  $G$ , each vertex exactly once is known as  
a) Eulerian path                      b) Eulerian trial  
c) Hamiltonian path                      d) Hamiltonian circuit



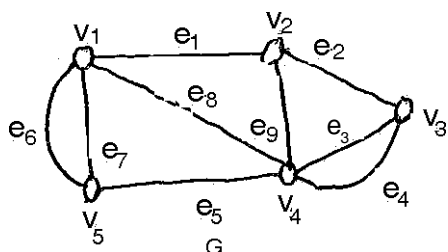


- 10) In a tree T there exists \_\_\_\_\_ path between every pair of vertices in T.  
 a) Multiple                      b) Unique                      c) More than 1                      d) Exactly two
- 11) In a binary tree, all the vertices of degree three are called as  
 a) Internal vertices                      b) Intermediate vertices  
 c) Root                      d) General vertices
- 12) Let G be a connected graph. Let T be its spanning tree then the edges of graph G which are included in spanning tree T are called as \_\_\_\_\_ w.r.t. spanning tree T.  
 a) Branches                      b) Chords                      c) Adjacent edges                      d) None of these
- 13)  $N_5$  is \_\_\_\_\_ regular graph.  
 a) 5                      b) 4                      c) 1                      d) 0
- 14) The order of recurrence relation  $a_n - 7 a_{n-1} + 10 a_{n-2} = 0$  is  
 a) n                      b) n - 1                      c) 1                      d) 2

2. Attempt **any seven** of the following :

14

- 1) Draw the graphs  $K_{1,5}$  and  $K_{3,2}$ .
- 2) From the following graph, draw the graph  $G - V_2$  and  $G - \{e_1, e_5, e_8\}$ .

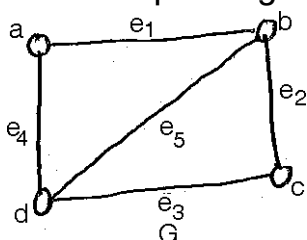


- 3) Define linear recurrence relation with constant coefficients of order K.
- 4) Define Eulerian circuit and Eulerian graph.
- 5) Define Binary tree with suitable example.
- 6) Find the number of edges in a complete graph with 12 vertices.
- 7) Define trail and path.
- 8) Define spanning subgraph.
- 9) Find the number of edges in a graph G with 5 vertices in which 2 vertices have degree 3 and 3 vertices have degree 4.

3. A) Attempt **any two** of the following :

10

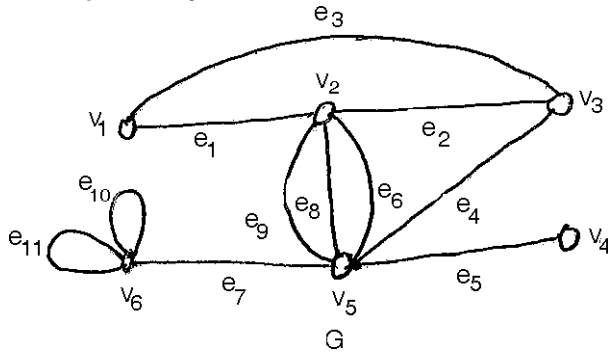
- 1) Prove that the number of vertices in a self complementary graph are of the type  $4K$  or  $4K + 1$ , where K is any integer.
- 2) Find the number of integers between 1 to 789 which are divisible either by 3 or by 5. Hence find the integers which are neither divisible by 3 nor by 5.
- 3) Draw all spanning trees of the following graph G.





B) Write adjacency matrix and incidence matrix for the following graph G.

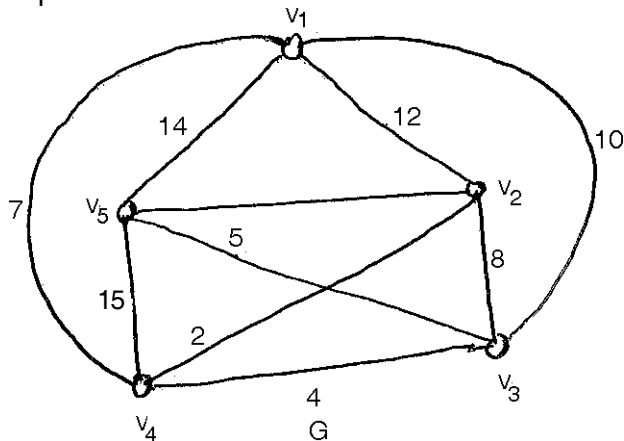
4



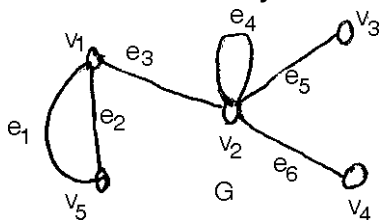
4. Attempt **any two** of the following :

14

1) Solve the following travelling salesman problem with head quarter at vertex  $V_1$ . Hence find the minimum distance travelled by salesman.

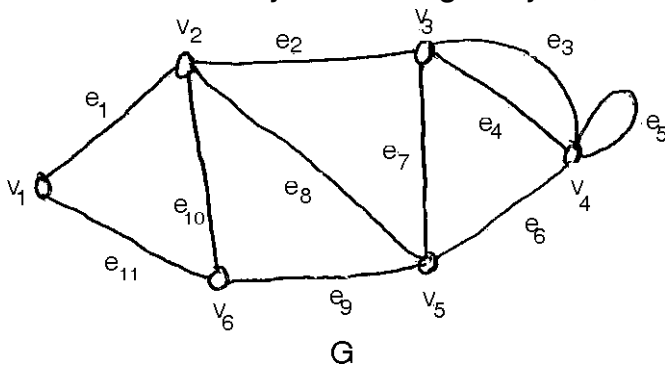


2) Define isthmus, cut vertex, vertex connectivity. Hence find all the isthmus and vertex connectivity of the following graph G.



3) Define vertex disjoint and edge disjoint subgraphs. Hence draw one pair of subgraphs which are

- i) Both vertex disjoint and edge disjoint and
- ii) Neither vertex disjoint nor edge disjoint, from the following graph G.

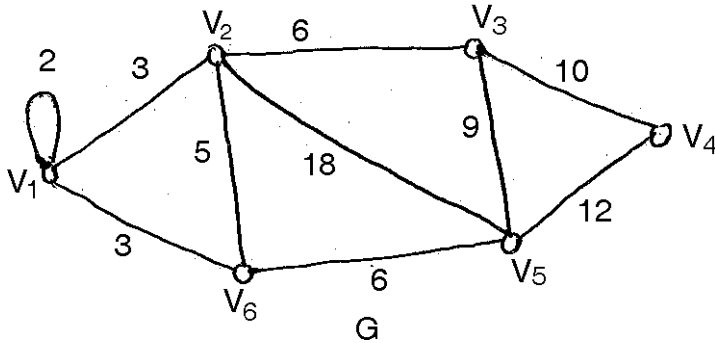




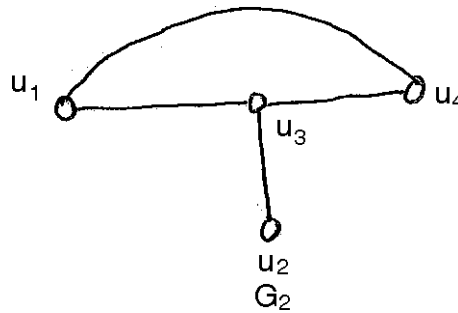
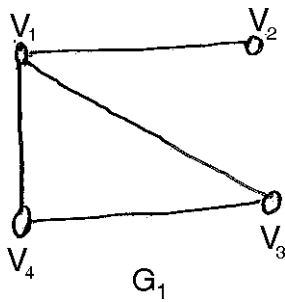
5. Attempt **any two** of the following :

14

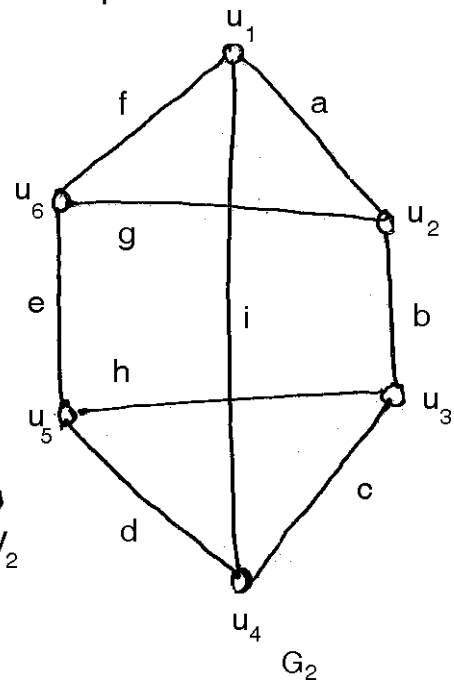
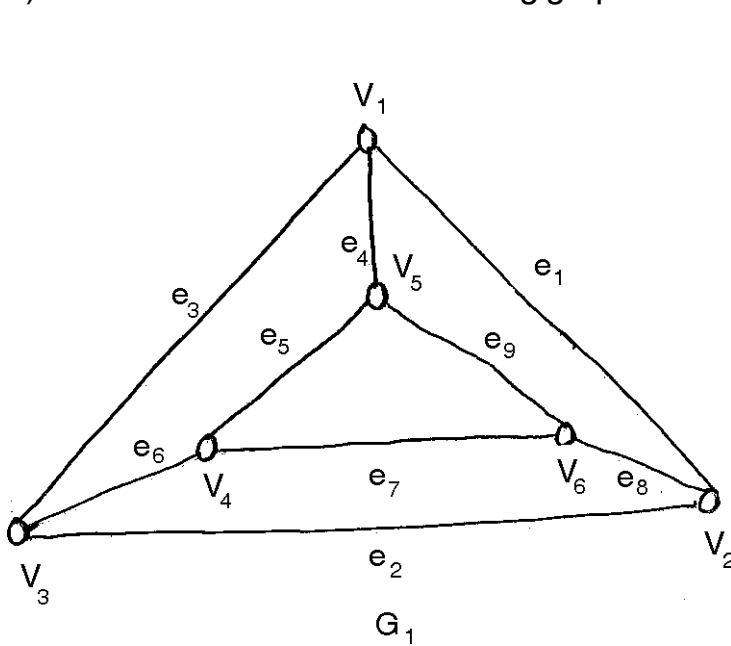
- 1) Find the shortest spanning tree and its weight for the following weighted connected graph  $G$ , by using Kruskal's algorithm.



- 2) Define intersection of two graphs. Hence draw the graph  $G_1 \times G_2$  from the following graphs.



- 3) Determine whether the following graphs are isomorphic or not.





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**B.Sc. (ECS) – I (Semester – I) (New – CBCS) Examination, 2016**  
**MATHEMATICS (Paper – VII)**  
**Numerical Methods**

Time : 2 Hours 30 Minutes

Max. Marks : 70

- N.B. :** 1) **All questions are compulsory.**  
2) Figures to the **right** indicate **full** marks.  
3) **Use of Scientific calculator is allowed.**

1. Choose correct alternative for **each** of the following : **14**

1) The order of row matrix is

- a)
- $1 \times n$
- b)
- $n \times n$
- c)
- $m \times n$
- d)
- $n \times 1$

2)  $0.3456 E_4 \div 0.2312 E_{-2} =$ 

- a)
- $0.1494 E_6$
- b)
- $1.4948 E_6$
- c)
- $1.4948 E_5$
- d)
- $1.4948 E_7$

3) The equation  $8 \cos x + 5x^2 = 0$  is \_\_\_\_\_ equation.

- a) Polynomial    b) Algebraic
- 
- c) Transcendental    d) None of these

4)  $E^{-5} f(x) =$ 

- a)
- $f(a)$
- b)
- $f(x + 3h)$
- c)
- $f(x + 5h)$
- d)
- $f(x - 5h)$

5) Simpson's  $\frac{1}{3}$ <sup>rd</sup> rule is obtain by putting  $n =$  \_\_\_\_\_ in general quadrature formula.

- a) 1    b) 2    c) 3    d) 4

6) If  $x = a$  is root of equation  $f(x) = 0$  then

- a)
- $f(a) < 0$
- b)
- $f(a) > 0$
- c)
- $f(a) \neq 0$
- d)
- $f(a) = 0$

7) A matrix of order  $n \times n$  is a

- a) column matrix    b) scalar matrix
- 
- c) square matrix    d) rectangular matrix

P.T.O.



- 8) While doing the multiplication of two numbers in normalized floating point, the exponents should be
- a) added                      b) subtracted                      c) divided                      d) multiplied
- 9)  $1 + \Delta =$
- a)  $E^{-1}$                       b)  $\frac{1}{E}$                       c)  $E$                       d)  $\nabla$
- 10) One root of the equation  $f(x) = 0$  lies in the interval (a, b). If  $f(a)$  and  $f(b)$  have \_\_\_\_\_ sign.
- a) same                      b) opposite                      c) positive                      d) negative
- 11)  $0.009565 =$  \_\_\_\_\_ in floating point representation.
- a)  $0.9565 E_2$                       b)  $0.9565 E_{-2}$                       c)  $0.9565 E_0$                       d)  $0.9565 E_4$
- 12)  $\nabla f(x) = f(x)$
- a)  $f(x+h)$                       b)  $E f(x)$                       c)  $f(x-h)$                       d) none of these
- 13) Inverse of matrix 'A' exist iff
- a)  $|A| = -1$                       b)  $|A| = \infty$                       c)  $|A| \neq 0$                       d) None of these
- 14) In Runge-Kutta II<sup>nd</sup> order method,  $K_1 =$
- a)  $hf(x_0, y_0)$                       b)  $hf(x_0 + h, y_0)$   
 c)  $hf(x_0 + h, y_0 + k_0)$                       d)  $hf(x_1, y_1)$

2. Attempt **any seven** of the following :

14

1) Prepare the Forward difference table for the following data :

x	2	4	6	8	10
f(x)	5	17	37	65	101

2) Write Simpson's  $\frac{3}{8}$ <sup>th</sup> rule.

3) Write augmented matrix for the following system of equations.

$$2x - y + z = 4; \quad x + 2y + z = 3; \quad -x + 3z = 7.$$

4) State the formula for  $k_2$  and  $k_3$  for Runge Kutta 2<sup>nd</sup> order method.



- 5) Find value of  $0.4546 E_5 + 0.5433 E_7$  , write your answer in normalised floating point form.
- 6) Find the interval in which root of the equation  $x^3 - 3x + 4 = 0$  lies.
- 7) Write the formula to find  $x_1$  by Regula Falsi (False-position) method.
- 8) Show that,  $\nabla E = \Delta$  .

9) Show that matrix  $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$  is invertible.

3. A) Attempt **any two** : 10

- 1) Solve the following system by Gauss-Jordan elimination method.  
 $x + z = -1; y + z = -4; 4x + y + z = 0.$
- 2) Prove that  $(1 + \Delta)(1 - \nabla) = 1.$
- 3) Find the root of equation  $x^3 + x - 1 = 0$  by bisection method perform only three interactions.

B) Find  $A^{-1}$  by using row reduction method, if exist. 4

$$A = \begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{bmatrix}_{3 \times 3}$$

4. Attempt **any two** of the following : 14

- 1) Find  $f(g)$  by using Lagranges formula. Use following data.

x	11	13	17	19
f(x)	1452	2366	5202	6304



2) Define :

1) Absolute error ( $E_A$ )

2) Relative error ( $E_R$ )

3) Percentage error ( $E_P$ ) and find value of

1)  $0.4356 E_{10} + 0.3462 E_{10}$

2)  $4.8692 E_{-2} \times 0.4321 E_6$ .

Write your answer in normalised floating form.

3) Evaluate  $\int_2^{10} \frac{dx}{1+x}$  by using Trapezoidal rule taking  $h = 1$ .

5. Attempt **any two** :

14

1) Find  $f(12)$  by using Newton's forward difference interpolation formula.

x	10	15	20	25	30
f(x)	14	18	28	39	52

2) By using Euler's method solve  $\frac{dy}{dx} = x^2 + y^2$  given that  $y(0) = 1$ ;  $h = 0.1$ , find  $y(0.3)$ .

3) Evaluate  $\int_0^4 (1+x^2)dx$  by dividing the interval into 8 equal parts by using

Simpson's  $\frac{1}{3}$  rule.

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**B.Sc. (E.C.S.) (Part – I) (Semester – I) (CBCS – Pattern) Examination, 2016  
DESCRIPTIVE STATISTICS – I (New) (Paper – VIII)**

Time : 2½ Hours

Max. Marks : 70

- Instructions :** i) **All questions are compulsory.**  
ii) **Figures to *right* indicate *full* marks.**  
iii) **Use of *any type* of calculator is *allowed*.**  
iv) **Graph paper will be supplied on *request*.**

1. Select most correct alternative :

14

- 1) Census method is not applicable \_\_\_\_\_
  - a) if population is infinite
  - b) for testing blood
  - c) if items are destroyed under investigation
  - d) all of these
- 2) SRS method provides representative sample if population is \_\_\_\_\_
  - a) homogeneous
  - b) heterogeneous
  - c) infinite
  - d) none of these
- 3) To draw frequency polygon, frequency is plotted against \_\_\_\_\_ of respective classes.
  - a) upper limit
  - b) lower limit
  - c) mid-points
  - d) none of these
- 4) A variable is said to be discrete if \_\_\_\_\_
  - a) it takes finite values
  - b) it takes countable infinite values
  - c) it takes particular values only
  - d) all of these
- 5) The measure of central tendency that cannot be determined graphically is \_\_\_\_\_
  - a) A.M.
  - b) Median
  - c) Mode
  - d) All of these

P.T.O.





- 6) If each observation is increased, then \_\_\_\_\_
- a) A.M. is increased                      b) Median is increased  
c) Mode is increased                      d) All of these
- 7) The measure of dispersion that based on all observations is \_\_\_\_\_
- a) S.D.    b) Q.D.  
c) Range                                        d) All of these
- 8) The S.D. of 10 observations is 25. If each observation is multiplied by 3, then S.D. becomes \_\_\_\_\_
- a) 75    b) 25  
c) 30    d) 225
- 9) For a symmetric distribution \_\_\_\_\_
- a)  $\mu_3 = 0$                                       b)  $(Q_3 - Q_2) = (Q_2 - Q_1)$   
c) A.M. = Median = Mode                      d) all of these
- 10) Even order central moments are \_\_\_\_\_
- a) always + ve                                  b) sometimes + ve  
c) never + ve                                      d) none of these
- 11) Let A : Sampling increases accuracy  
B : Sampling is time consuming method
- a) A and B both true                              b) A and B both false  
c) A is true, B is false                              d) None of these
- 12) Let A : First order moment about origin is A.M.  
B : First order central moment is zero
- a) A and B both true                              b) A and B both false  
c) A is true, B is false                              d) None of these
- 13) If  $u = (x - A)/B$ , then A.M. of X = \_\_\_\_\_
- a)  $B\bar{u} + A$                                       b)  $(\bar{u} - A)/B$   
c)  $B\bar{u} - A$                                       d) None of these



- 14) If each observation is increased or decreased by some constant, then Q. D. becomes \_\_\_\_\_
- a) as it is
  - b) increased
  - c) decreased
  - d) none of these

2. Attempt **any seven** of the following : 14

- 1) Define class limits.
- 2) Define Range, coefficient of range.
- 3) State any two demerits of A.M.
- 4) State any two limitations of census method.
- 5) Given :  $n = 12$ ,  $\sum X = 75$ ,  $\sum (X - A.M.)^2 = 132$ . Find C.V.
- 6) The first 3 moments about origin are 4, 10 and 36 respectively. Find  $\mu_3$ .
- 7) Find median for : 40, 42, 38, 36, 33, 50, 22.
- 8) Given :  $Q_1 = 27$ ,  $Q_2 = 35$  and  $Q_3 = 40$ . Comment on skewness.
- 9) Using empirical relation find median if mean and mode of a distribution are 40 and 28 respectively.

3. A) Attempt **any two** of the following : 10

- 1) The A.M. of 100 observations is 58. At the time of calculation two observations 62 and 57 were wrongly taken as 42 and 47. Find correct A.M.
- 2) Find Q.D. and coefficient of Q.D. for : 14, 23, 17, 30, 35, 33, 12.
- 3) Write a note on frequency distribution.

B) Define Kurtosis. Explain types of Kurtosis. 4

4. Attempt **any two** of the following : 14

- 1) Draw histogram to represent the following data and hence obtain mode :

<b>Class</b>	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
<b>Frequency</b>	18	22	30	27	14	10



2) Find C.V. for the data given below :

<b>Class</b>	12 – 16	16 – 20	20 – 24	24 – 28	28 – 32
<b>Frequency</b>	2	7	11	9	3

3) Explain simple random sampling method and give one illustrative example.

5. Attempt **any two** of the following :

**14**

1) Explain construction of ogives.

2) Given :  $n = 10$ ,  $\sum X = 160$ ,  $\sum X^2 = 3756$ ,  $\sum X^3 = 12187$ ,  $\sum X^4 = 97204$ . Find coefficient of skewness and comment on result.

3) For the data given below find missing frequency of the class 45 – 54 if median is 44.

<b>Class</b>	18 – 27	27 – 36	36 – 45	45 – 54	54 – 63	63 – 72
<b>Frequency</b>	10	22	36	–	19	9

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**B.Sc. (E.C.S.) (Part – I) (Sem. – I) (New-CBCS-Pattern) Examination, 2016**  
**PROBABILITY THEORY – I**  
**(Paper – IX)**

Time : 2½ Hours

Max. Marks : 70

- Instructions:** i) **All questions are compulsory.**  
ii) Figures to **right** indicates **full** marks.  
iii) Use of any type of calculator is **allowed**.

1. Select most correct alternative :

14

- 1) In  ${}^n C_r$   
a)  $n > r$                       b)  $n < r$                       c)  $n \geq r$                       d) none of these
- 2) Number of ways by which a committee of 'r' members out of 'n' is to be formed such that a particular member is never in the committee is  
a)  ${}^n C_r$                       b)  ${}^{n-1} C_r$                       c)  ${}^n C_{r-1}$                       d)  ${}^{n-1} C_{r-1}$
- 3) Number of different ways by 'k' things out of 'n' distinct things are to arranged is  
a)  $k!$                       b)  $(n - k)!$                       c)  ${}^n P_k$                       d)  ${}^n C_k$
- 4) Number of different words that can be formed by arranging the letters of the word 'HAPPY' are  
a)  ${}^5 P_5$                       b)  ${}^5 C_5$                       c)  $6 \frac{5!}{2!}$                       d) none of these
- 5) If  $P(B) = 1 - P(A)$ , then  
a) A and B are independent events  
b) A and B are mutually exclusive events  
c) B is complementary event of event A  
d) None of these



- 6) If A and B are mutually exclusive events, then
- a)  $P(A) = P(B)$
  - b)  $P(A \cap B) = 0$
  - c)  $P(A \cup B) = 1$
  - d) None of these
- 7) If A and B are independent events, then
- a)  $P(A \cap B) = P(A) \cdot P(B)$
  - b)  $P(A/B) = P(A)$
  - c)  $P(\bar{A} / \bar{B}) = P(\bar{A})$
  - d) All of these
- 8) A card is drawn from a pack of 52 playing cards. If A : getting red card and B : getting black card, then events A and B are
- a) mutually exclusive
  - b) Equally likely
  - c) Exhaustive
  - d) All of these
- 9) A coin is tossed 3 times. If X be a r.v. denoting number of times head is appeared, then
- a)  $0 \leq X \leq 3$
  - b)  $X = 1, 2, 3$
  - c)  $X = 0, 1, 2, 3$
  - d) None of these
- 10) For a discrete r.v. X,  $E(X) = 3$  and  $E(X^2) = 18$ , then S.D. of X is
- a) 3
  - b) 9
  - c)  $\sqrt{18}$
  - d) None of these
- 11) The c.d.f. of a discrete r.v. X is F(X), then  $P(a \leq X \leq b) =$
- a)  $F(b) - F(a)$
  - b)  $F(b) - F(a) + P(a)$
  - c)  $F(b) - F(a) + P(b)$
  - d) None of these
- 12) \_\_\_\_\_ distribution has mean > variance always.
- a) Binomial
  - b) Poisson
  - c) Hyper geometric
  - d) Uniform
- 13) If  $X \rightarrow B(20, 0.4)$ , then  $Y = (20 - X) \rightarrow$
- a)  $B(20, 0.4)$
  - b)  $B(20, 0.6)$
  - c)  $B(10, 0.6)$
  - d) None of these
- 14) A discrete r.v. X has Poisson distribution with parameter 1.5 then  $E(X + 5) =$
- a) 1.5
  - b) 6.5
  - c) 5
  - d) None of these



2. Attempt **any seven** of the following : 14

- 1) State addition principle of counting.
- 2) Define c.d.f. of discrete r.v.
- 3) Define equally likely events.
- 4) Given :  $P(A) = 0.2, P(B) = 0.7$ . Find  $P(A \cup B)$  if events A and B are mutually exclusive events.
- 5) If  $X \rightarrow B(6, 0.4)$ , state  $E(X), E(X + 4)$ .
- 6) Find value of k if following is the p.m.f. of discrete r.v.X.

<b>X</b>	1	3	5	9
<b>P(X)</b>	0.4	k	0.2	2k

- 7) Find value of n if  ${}^nC_2 + {}^{n+2}C_2 = 25$ .
- 8) If  $X \rightarrow H(25, 10, 6)$ , state  $E(X)$ .
- 9) Find parameter of Poisson distribution if  $P(X = 0) = P(X = 2)$ .

3. A) Attempt **any two** of the following : 10

- 1) Find number of possible arrangements of 5 books on Computer, 4 books on Statistics and 3 books on Mathematics are to put on shelf such that, all books on same subject are always together.
- 2) A box contains 6 black and 4 white balls. Two balls are drawn at random one by one without replacement. Find probability that second ball drawn is black.
- 3) Following is the p.m.f. of discrete r.v.X. Find (i) mode of X (ii)  $P(|9 - X| \leq 4)$ .

<b>X</b>	2	4	6	8	10
<b>P(X)</b>	0.15	0.25	0.35	0.2	0.05

B) Define Binomial distribution. Give two real life situations where it is applicable. 4



4. Attempt **any two** of the following : **14**
- 1) State axioms of probability. Prove that (i)  $P(\phi) = 0$ , where  $\phi$  is null event  
(ii)  $P(\bar{A}) = 1 - P(A)$ .
  - 2) A discrete r.v.  $X$  takes values 0, 1, 2, 3, 4 such that  $P(1 < X \leq 4) = 0.75$ ,  $P(X \leq 1) = 0.25$ ,  $P(X = 2) = 2P(X = 1)$ ,  $P(X > 3) = 0.2$  and  $P(0 < X \leq 2) = 0.45$ . Find probability distribution of  $X$ .
  - 3) 1.5% of led bulbs produced by a company are defective. They are packed in boxes containing 100 bulbs each. In a consignment of 500 boxes how many are expected to have 2 defective bulbs ?
5. Attempt **any two** of the following : **14**
- 1) Define hyper geometric distribution, under which conditions it is applicable, give two real life examples where it is applicable.
  - 2) A box contains 8 ticket 222, 223, 232, 322, 233, 323, 332, 333. A ticket is drawn at random from the box. Let A : first digit of the number on ticket drawn is 2, B : second digit of the number on ticket drawn is 2 and C : third digit of the number on ticket drawn is 2. Discuss the independence of events A, B and C.
  - 3) Show that
    - i)  ${}^n C_r + {}^n C_{r-1} = {}^{n+1} C_r$
    - ii)  $n \cdot {}^n C_{r-1} = r \cdot {}^n C_r + (r-1) \cdot {}^n C_{r-1}$ .
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**B.Sc. – I (Semester – I) (E.C.S.) (CGPA) Examination, 2016**  
**Paper – I : ENGLISH – I (Compulsory) (Old)**  
**On Track : English Skills for Success**

Time : 2 Hours 30 Minutes

Max. Marks : 70

**Instructions :** i) **All questions are compulsory.**  
ii) **Figures to the right indicate full marks.**

1. Rewrite the following sentences by choosing the correct alternatives : 14
- i) Bob realised the plain-clothes policeman was not his friend only after seeing his  
a) eyes                      b) ears                      c) nose                      d) forehead
- ii) The note that the man from the west received was in fact from  
a) the owner of the restaurant                      b) chicago police  
c) his friend Jimmy                      d) his wife
- iii) The black trunks contained all the items that Miss Krishna  
a) had stolen from different places                      b) had bought from a little shop  
c) inherited from her mother                      d) had got as gifts from her friends
- iv) In the end the narrator refused to accept all of Miss Krishna's possessions except a  
a) tiny glazed coffee cup                      b) cigarette lighter  
c) small burmese lacquered box                      d) little nine-inch clock
- v) The psychologist who developed the IQ test was  
a) Mr. Roger Penrose                      b) Mr. Binet  
c) Sigmund Freud                      d) Attila Narin
- vi) Some experts say that the \_\_\_\_\_ intelligence will soon come into existence.  
a) artificial                      b) natural                      c) scientific                      d) pseudo
- vii) In the poem, Bangle Sellers, bangles are the token of  
a) freedom                      b) shackles                      c) sacrifice                      d) prosperity

P.T.O.





- viii) The words 'shining loads' mean  
 a) the flame of a marriage fire                      b) sunlit corn  
 c) bunches of bangles                                      d) a woman's jewels
- ix) The plural form of 'mouse' is  
 a) mouses                      b) mouse's                      c) mousis                      d) mice
- x) Afifa loved Russia and \_\_\_\_\_ beautiful palaces, churches and beach resorts.  
 a) its                      b) his                      c) her                      d) it's
- xi) Sneha painted the table  
 a) himself                      b) herself                      c) myself                      d) itself
- xii) Anwar is \_\_\_\_\_ kindest person I have ever seen.  
 a) a                      b) an                      c) the                      d) no article
- xiii) Mr. Kedar looked \_\_\_\_\_ his daughter well after his wife's untimely death.  
 a) at                      b) after                      c) for                      d) about
- xiv) Father returned home \_\_\_\_\_ 10 o'clock.  
 a) on                      b) in                      c) to                      d) at

2. Answer in brief **any seven** of the following questions.

**14**

- i) What sort of relationship did Bob and Jimmy share ?
- ii) Why did Jimmy send another Police Officer to arrest Bob ?
- iii) What was content of the note send by Jimmy to Bob ?
- iv) What do you understand of Miss Krishna's childhood from the story ?
- v) What was the narrator's experience of having Miss Krishna's stay at her house ?
- vi) How did Krishna's sister behave with the narrator ?
- vii) How can you define 'intelligence' ?
- viii) What are the areas in which the computer is much faster than a human brain ?

3. A) Write paragraphs of about 10 lines on **any two** of the following :

**8**

- i) My Hobby.
- ii) My favourite dish.
- iii) Importance of dictionary.



B) Write answers to the following questions in about **8 lines each. Any two.** **6**

- i) What image of the bangle sellers at the temple do you gather from the poem ?
- ii) How are the bangle sellers true friends of women ?
- iii) How does the Irish airman imagine he will die ?

4. Write an essay on **any one** of the following topics : **14**

- i) Terrorism – a great threat to the world.
- ii) The role of youth in nation building.

5. Read the following passage carefully and make a note of it : **14**

It is true that progress in knowledge has led to the development of science and technology, which has in turn, profoundly altered man's environment. For example, fertilizers and insecticides have increased agricultural output which is required to feed the swelling population of the world. However, both give rise to pollution. Each one in the modern world has accumulated in our bodies a few milligrams of D.D.T., a type of insecticide. The DDT level in fish is rising and already some fish-eating birds are becoming sterile. Fertilizers used in farm-lands are washed away by rain into rivers, lakes and reservoirs. The growth of vegetation in these takes away a lot of oxygen from the waters, as a result, all the fish is lost. Massive industrialization too has led to serious pollution of the environment. Millions of tons of smoke, sulphur gas, ash and unknown quantities of toxic by-products are sent up every day all over the world and we simply do not know if our new chemical environment is slowly poisoning us all. What is even worse, the increase in the carbon dioxide content of the atmosphere from burning oil and coal may, in time, prevent the escape of the sun's heat from the earth, leading to a rise in the earth's temperature, the melting of the ice-caps and a rise in the level of the ocean ?

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**B.Sc. (ECS) – I (Semester – I) (CGPA Pattern) Examination, 2016**  
**COMPUTER SCIENCE (Paper – II) (Old)**  
**Computer Fundamentals and Programming Using C – I**

Time : 2½ Hours

Max. Marks : 70

- N. B. :** 1) **All questions are compulsory.**  
2) Figures to the **right** place indicate **full** marks.  
3) Answer of **two** Sections should be written in **separate** answer sheet.

**SECTION – I**  
**(Computer Fundamentals)**

1. Multiple choice questions :

5

- 1) Which of the following is the largest unit of storage ?
  - a) GB
  - b) KB
  - c) MB
  - d) TB
- 2) Which of the following is true ?
  - a) Byte is a single digit in a binary number
  - b) Bit represents a grouping of digital numbers
  - c) Eight-digit binary number is called a byte
  - d) Eight-digit binary number is called a bit
- 3) The first computers were programmed using \_\_\_\_\_
  - a) High level language
  - b) Machine language
  - c) Source code
  - d) Object code
- 4) Linux is \_\_\_\_\_ operating system.
  - a) Open-source
  - b) Microsoft
  - c) Windows
  - d) None of these
- 5) Magnetic tape is \_\_\_\_\_ storage device.
  - a) Random
  - b) Sequential accessed
  - c) Track
  - d) None of these



2. Answer **any five** of the following : 10
- 1) What is SMPS ?
  - 2) List the various input devices.
  - 3) Syntax and example of MD command.
  - 4) What is use of batch file ?
  - 5) What is expansion slots ?
  - 6) List the application of computer.
  - 7) What is system software ?
3. A) Write short note on **any two** of the following : 10
- 1) Short note on laser printer.
  - 2) Short note on magnetic disk.
  - 3) Write the difference between compiler and interpreter.
- B) Answer **any one** of the following : 10
- 1) What is computer ? Explain different types of computer based on size.
  - 2) What is operating system ? Explain multiprogramming, multiprocessing and time sharing operating system in details.

SECTION – II  
(Programming Using C-I)

1. Multiple choice questions : 5
- 1) The automatic type conversion is called as \_\_\_\_\_
    - a) rounding
    - b) ceiling
    - c) implicit conversion
    - d) explicit conversion
  - 2) In C language iteration logic done by \_\_\_\_\_
    - a) while
    - b) do-while
    - c) for
    - d) all of these
  - 3) The valid range of unsigned int is \_\_\_\_\_
    - a) –32767 to 32768
    - b) 0 to 65535
    - c) 0 to 4294967295
    - d) none of these



- 4) A vector is a \_\_\_\_\_ dimensional array.
  - a) one
  - b) two
  - c) multi
  - d) both a) and b)
- 5) If float X, Y ; (X = 3.4, Y = 2.0) then X%Y gives result \_\_\_\_\_
  - a) 0.17
  - b) 1.7
  - c) 17.00
  - d) error

2. Answer **any five** of the following : 10

- 1) State keyword used in C language.
- 2) What is the use of break statement ?
- 3) Syntax and example of conditional operator.
- 4) Write any four inbuilt function that belongs to math.h header file.
- 5) Explain increment and decrement operator.
- 6) List out rules for declaration of identifier.
- 7) Define string. Write syntax to declare it.

3. A) Write short note on **any two** of the following : 10

- 1) Explain multi way decision making statement.
- 2) Write a program to check entered number is perfect or not.
- 3) Write a program to check entered number is prime or not.

B) Answer **any one** of the following : 10

- 1) Write a program to calculate multiplication of  $3 \times 3$  matrix.
  - 2) Explain forward and backward jump of goto statement with example.
-



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**B.Sc. (ECS) – I (Semester – I) Examination, 2016  
(CGPA Pattern) (Old)  
ELECTRONICS (Paper – III)  
Linear And Digital Electronics – I**

Time : 2½ Hours

Max. Marks : 70

- Instructions:** 1) **All** questions are **compulsory**.  
2) Figures to **right** indicate **full** marks.  
3) Draw circuit diagram **wherever** necessary.

SECTION – I

(Linear)

1. Multiple choice questions :

5

- 1) In case of resistor \_\_\_\_\_ is tolerance for gold color band.  
a) + 2%      b) + 5%      c) + 10%      d) + 20%
- 2) The current at the node is  
a) High      b) Low      c) Equal      d) Zero
- 3) The PIV of full wave rectifier is  
a) 2VP      b) VP      c) 4VP      d) VP/2
- 4) There are excess electrons in \_\_\_\_\_ type semiconductor.  
a) Impure      b) P      c) N      d) None of these
- 5) The dc alpha of transistor is  
a)  $I_C/I_E$       b)  $I_C/I_B$       c)  $I_E/I_B$       d)  $I_B/I_C$

2. Answer **any five** of the following :

10

- 1) Explain Norton theorem.
- 2) Define capacitor and capacitance.

P.T.O.





2. Answer **any five** of the following :

10

- 1) Explain race around condition.
- 2) Explain Nibble multiplexing.
- 3) What is mean by fan in, fan out ?
- 4) What is mean by ASCII code ?
- 5) Solve the following examples.
  - a)  $(1000)_{10} = (?)_{16}$
  - b)  $(622)_8 = (?)_{10}$
- 6) Explain decoder.
- 7) Explain BCD code.

3. A) Write short note on **any two** of the following :

10

- 1) Explain Half and Full adder.
- 2) Write a note on Excess-3 code.
- 3) Write a note on Karnaugh map.

B) Answer **any one** of the following :

10

- 1) Explain multiplexer and demultiplexer.
  - 2) Explain Hamming code.
-





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**B.Sc. (ECS) – I (Semester – I) (CGPA Pattern) Examination, 2016**  
**MATHEMATICS (Paper – IV) (Old)**  
**Graph Theory and Numerical Methods**

Time : 2 Hours 30 Minutes

Max. Marks : 70

- N.B. :** 1) Write answers of Section I and Section II on **separate** answer books.  
2) **All** questions are **compulsory**.  
3) **Use** of scientific calculator is **allowed**.  
4) Figures to the **right** indicate **full** marks.

SECTION – I  
(Graph Theory)

1. Choose the correct alternative.

5

- i) The total degree of a complete bipartite graph  $K_{m,n}$  is  
a)  $m + n$                       b)  $2mn$                       c)  $m.n$                       d)  $m - n$
- ii) If a connected graph  $G$  has 3 isthmus i.e. cut edges then its edge connectivity is  
a) 3                      b) 2                      c)  $\infty$                       d) 1
- iii) The complement of a null graph is \_\_\_\_\_ graph.  
a) planner                      b) multi                      c) complete                      d) pseudo
- iv) \_\_\_\_\_ algorithm is used to find shortest spanning tree.  
a) Kruskal's                      b) Dijkstra's  
c) Fleury's                      d) Warshall's
- v) If  $G$  is self complementary graph on 'n' vertices then 'n' is of the type  
a)  $4k$                       b)  $4k + 1$   
c)  $4k$  and  $4k + 1$                       d)  $4k$  or  $4k + 1$

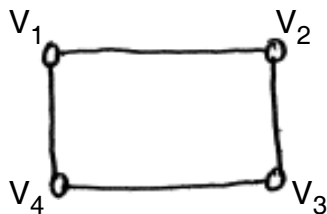


2. Attempt **any five** from the following. 10

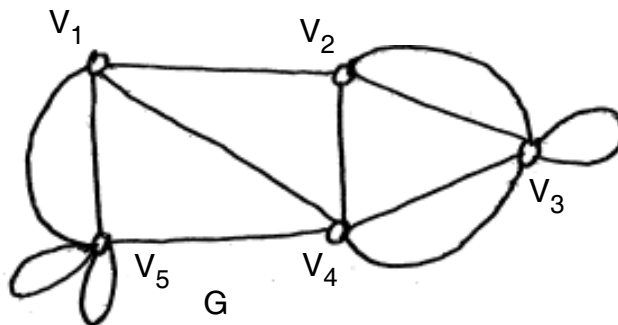
- i) Define regular graph with suitable example.
- ii) Define spanning tree. Give one example.
- iii) Draw a graph which is both Eulerian and Hamiltonian.
- iv) Define vertex disjoint subgraphs..
- v) Find the number of edges in complete graph  $K_7$ .
- vi) Define walk and path.
- vii) Define self complementary graph.

3. A) Attempt **any two** from the following. 10

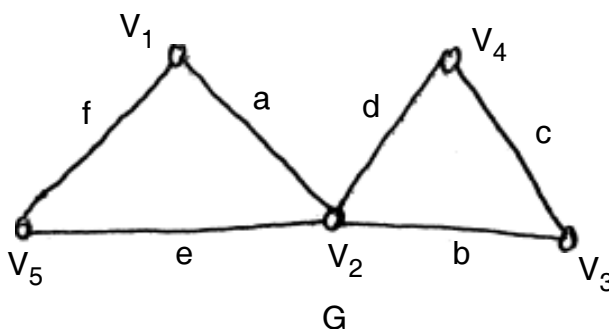
i) Draw all possible spanning subgraphs of following graph G.



ii) State the Hand Shaking Lemma. Hence verify it for the following graph G.



iii) Trace an Euler's circuit for the following connected graph G by using Fleury's algorithm.

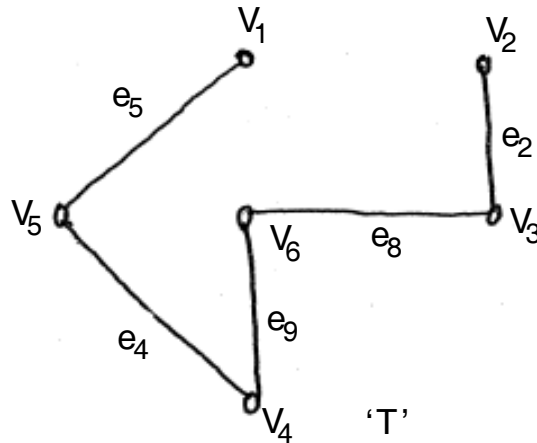
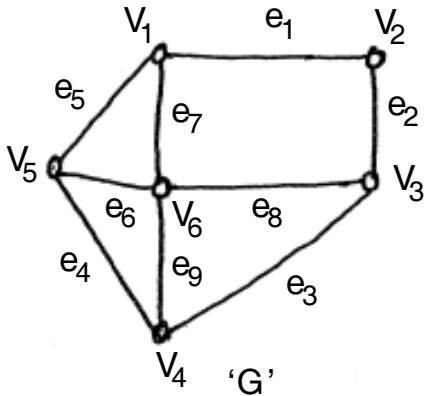




B) Attempt **any one** from the following.

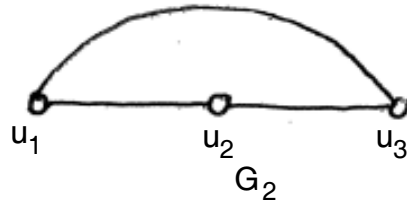
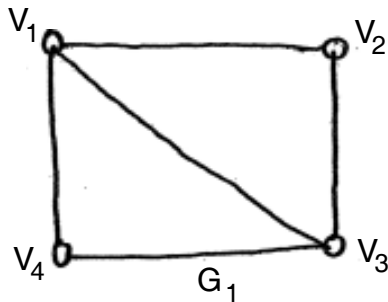
10

i) Find all fundamental circuits and fundamental cutsets of the graph G w.r.t. spanning tree T.



- ii) Define
  - a) intersection of two graphs
  - b) ring sum of two graphs.

Draw the graph  $G_1 \times G_2$  from the following graphs.



SECTION – II  
(Numerical Methods)

1. Choose the correct alternative.

5

- i)  $\Delta \nabla =$ 
  - a)  $\Delta - \nabla$
  - b)  $\Delta + \nabla$
  - c)  $\Delta^2$
  - d)  $\nabla - \Delta$
- ii) If all the variables of the system of linear equations are leading variables then the system possess \_\_\_\_\_ solutions.
  - a) infinitely many
  - b) inconsistent
  - c) trivial
  - d) unique
- iii) \_\_\_\_\_ method is used to solve ordinary differential equation.
  - a) Trapezoidal
  - b) Newton's divided difference
  - c) Taylor's
  - d) Bisection



- iv) While doing multiplication of two numbers in normalized floating point, the mantissas should be  
 a) multiplied                      b) added                      c) subtracted                      d) divided
- v) One of the roots of equation  $f(x) = 0$  lies in interval  $[x_0, x_1]$  iff  $f(x_0)$  and  $f(x_1)$  have \_\_\_\_\_ signs.  
 a) same                      b) opposite                      c) positive                      d) negative

2. Attempt **any five** from the following.

10

- i) Find the interval in which one of the roots of the equation  $x^3 - 4x - 7 = 0$  lies.  
 ii) Show that  $E = 1 + \Delta$ .  
 iii) Define relative error and absolute error.  
 iv) State general quadrature formula for equidistant ordinates.  
 v) Write augmented matrix for the following system  
 $x_1 + x_2 + x_3 + x_4 = -2$ ,  $-2x_2 + 3x_4 = 3$ ,  $3x_1 - 2x_2 + x_3 = 6$   
 vi) Write the formulae for  $k_1$  and  $k_2$  in Runge-Kutta II order method.  
 vii) Evaluate  $0.3986E4 + 0.4563E3$ .

3. A) Attempt **any two** from the following.

10

- i) Obtain Newton-Raphson formula to find square root of the given number 'C'.  
 ii) Evaluate  $\int_0^5 (1+x^2)dx$  by dividing the interval of integration into 10 equal parts by using Trapezoidal rule.  
 iii) Find  $A^{-1}$  if exists, by using Row reduction method.

$$A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \\ 4 & 1 & 8 \end{bmatrix}_{3 \times 3}$$

B) Attempt **any one** from the following.

10

- i) Solve the ordinary differential equation  $\frac{dy}{dx} = \frac{y-x}{y+x}$  with  $n_0 = 1$ ,  $y_0 = 1.2$ . Find the value of  $y$  at  $x = 1.4$  i.e. find  $y(1.4)$  by using Runge-Kutta IV order method. Take  $h = 0.4$ .  
 ii) State Newton's Forward Difference Interpolation Formula and Newton's Backward Difference Interpolation Formula. Find the value of  $f(6.5)$  from the following data by using Lagrange's Interpolation Formula.

<b>x</b>	-3	4	7
<b>y = f(x)</b>	-8	16	128



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**B.Sc. (E.C.S.) – I (Semester – I) (CGPA Pattern) Examination, 2016**  
**Paper – V : STATISTICS (Old)**  
**Descriptive Statistics and Probability Theory – I**

Time : 2½ Hours

Max.Marks : 70

- Instructions :**
- i) **All questions are compulsory.**
  - ii) **Figures to *right* indicate *full* marks.**
  - iii) **Use of any type of calculator is *allowed*.**
  - iv) **Graph paper will be supplied on request.**

## SECTION – I

**(Descriptive Statistics)**

1. Choose most correct alternative :

5

- 1) In \_\_\_\_\_ sampling method, the whole population is divided into sequential groups and size of each group is equal.
  - a) Systematic
  - b) Stratified
  - c) SRSWR
  - d) SRSWOR
- 2) Sum of relative frequencies is always
  - a) 1
  - b) 0
  - c) 100
  - d) Any the integer
- 3) \_\_\_\_\_ can be determined graphically.
  - a) Median
  - b) Mode
  - c) Quartiles
  - d) All of these
- 4) \_\_\_\_\_ measures of dispersion is based on all observations.
  - a) S.D.
  - b) Q.D.
  - c) Range
  - d) All of these
- 5) If  $\mu_3 < 0$ , then frequency distributions is
  - a) + vely skewed
  - b) – vely skewed
  - c) Symmetric
  - d) None of these



2. Attempt **any five** : **10**
- 1) Define frequency.
  - 2) Define median.
  - 3) State any two advantages of sampling method.
  - 4) Find value of 'a' of A.M. of observations 8, 12, 10, 15, 13, 11 a is 12.
  - 5) Given – A.M. = 45, Median = 37. Comment on skewness of distribution.
  - 6) Given – variance = 47,  $n = 15$ ,  $\sum X = 455$ . Find C.V.
  - 7) The first 3 moments about origin are 2, 10, 200 respectively. Find  $\mu_3$ .

3. A) Attempt **any two** : **10**
- 1) Define population, census method. State limitations of census method.
  - 2) Define S.D., C.V. State merits and demerits of S.D.
  - 3) Find Bowley's coefficient of skewness for the following data. Interpret the result.
- |            |    |    |    |    |    |    |    |
|------------|----|----|----|----|----|----|----|
| <b>X :</b> | 10 | 12 | 15 | 20 | 24 | 27 | 32 |
| <b>f :</b> | 3  | 7  | 12 | 19 | 17 | 11 | 4  |

- B) Attempt **any one** : **10**
- 1) What is measures of dispersion ? State the requirements of good measures of dispersion.
  - 2) Represent the following data by less than ogive and hence obtain median.
- |                    |      |       |       |       |       |       |       |       |
|--------------------|------|-------|-------|-------|-------|-------|-------|-------|
| <b>Class :</b>     | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 |
| <b>Frequency :</b> | 5    | 12    | 18    | 27    | 20    | 10    | 3     | 2     |

SECTION – II  
(Probability Theory – I)

4. Choose the most correct alternative : **5**
- 1) Expected value of constant is always
 

a) 1	b) 0
c) Constant itself	d) None of these
  - 2) The sample space corresponding to the experiment "seven seeds are planted and total number of seeds germinated are recorded after ten days" is
 

a) (0, 7)	b) {0, 1, 2, 3, 4, 5, 6, 7}
c) {0, 7}	d) None of these



- 3) If  $X \rightarrow B(n, p = 0.5)$  and  $E(X) = 20$  then  $n =$   
a) 20                      b) 25                      c) 40                      d) 15
- 4) The set of all possible outcomes of any random experiment is called  
a) Sample space    b) An event    c) Null set    d) None of these
- 5) If a fair die is tossed then probability of getting an odd number on uppermost face is  
a)  $3/6$                       b) 0.5                      c) 1                      d) Both a) and b)

5. Solve **any five** : **10**

- 1) Define permutation.
- 2) Define complement of an event with illustration.
- 3) State addition law of probability for events A and B.
- 4) Let X be a Poisson variate with parameter  $\lambda$ . If  $P(X = 2) = P(X = 1)$ . Find  $\lambda$ .
- 5) Let X be a discrete r.v. with p.m.f.

$$p(X = x) = \frac{x}{15} \quad \text{if } x = 1, 2, 3, 4, 5$$
$$= 0 \quad \text{if o.w.}$$

Find  $E(X)$ .

- 6) Find n if  ${}^n P_4 = 10 {}^n P_3$ .
- 7) Define discrete uniform distribution.

6. A) Solve **any two** : **10**

- 1) Let X be discrete r.v. with p.m.f.  $p(X)$ . Let a and b any constants then show that  $E(aX + b) = aE(X) + b$ .
- 2) Find value of X if  ${}^{14}C_2 + {}^{14}C_3 + {}^{15}C_4 + {}^{16}C_5 + {}^{17}C_6 = {}^{18}C_x$ .
- 3) A bag contains 4 red and 6 black balls. If 5 balls are selected at random one after other without replacement. Find number of combinations in which atleast 2 red balls are included.

B) Solve **any one** : **10**

- a) i) Define axiomatic probability and show that for any event A  $0 \leq P(A) \leq 1$ .  
ii) Define discrete uniform distribution. Find its mean and variance.
  - b) i) Define c.d.f. discrete r.v.X. State properties of it.  
ii) Find variance of number of heads when three fair coins are tossed simultaneously.
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**B.Sc. – I (Semester – II) (E.C.S.) (CGPA Pattern) Examination, 2016**  
**Paper – I : ENGLISH – II (Compulsory)**  
**On Track : English Skills for Success**

Time : 2½ Hours

Total Marks : 70

**N. B. :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Rewrite the following sentences by choosing correct alternative given below **each** : **14**

1) Wernher von Braun advised Dr. Kalam to make rocketry his mission and \_\_\_\_\_

- a) profession                      b) glory                      c) religion                      d) division

2) The full form of SLV is \_\_\_\_\_

- a) Satellite Loaded Vehicle                      b) Satellite Launching Vehicle  
c) Satellite Leaving Vehicle                      d) Satellite Leading Vehicle

3) When did Vivekananda leave Bombay \_\_\_\_\_

- a) On September 11, 1893                      b) On May 15, 1893  
c) On May 31, 1893                      d) On June 5, 1893

4) Who represented the Jains at the Parliament of Religions ?

- a) Vivekananda                      b) Gandhi  
c) Pratap Chander Mozoomdar                      d) Annie Besant

5) The Human Rights Movement began in 1961 with the launching of \_\_\_\_\_

- a) the UNO                      b) the Anti-Slavery Society  
c) the Amnesty International                      d) the NATO

6) The primary idea of human rights involves \_\_\_\_\_

- a) rights of the government  
b) rights for the government  
c) right formulated by the government  
d) rights to operate against the government





- 7) The poem “Brahma” displays the influence of \_\_\_\_\_ on Emerson.
- a) the Vedas    b) the Upanishads  
c) the Geeta    d) the Puranas
- 8) The poem ‘Full Moon’ is written by \_\_\_\_\_
- a) Robert Hayden    b) Sarojini Naidu  
c) W. B. Yeats    d) R. W. Emerson
- 9) Today the moon is merely an attraction for \_\_\_\_\_
- a) the children                  b) the poets                  c) the lovers                  d) the scientists
- 10) One message of the poem “Brahma” is that \_\_\_\_\_
- a) lovers of good deeds are dear to the god  
b) lovers with sincere love are dear to the god  
c) selfless devotees of the good are dear to the god  
d) non-devotees of the evil are dear to the god
- 11) The woman wouldn’t drink \_\_\_\_\_ tea without your company.
- a) my                                  b) her                                  c) our                                  d) his
- 12) Peacock is one of the \_\_\_\_\_ birds found in India.
- a) more wonderful    b) wonderful most  
c) most wonderful    d) only wonderful
- 13) He went to the tailor to \_\_\_\_\_ his trousers which was a bit too long.
- a) altar                                  b) alter                                  c) alert                                  d) allot
- 14) Write correct antonyms of ‘extempore’.
- a) well-prepared    b) careful  
c) extraordinary    d) none of these

2. Answer **any seven** of the following questions in **two** or **three** sentences :

**14**

- 1) What does Dr. Kalam say about working for mission ?
- 2) What does Wernher von Braun think of the American ?
- 3) Where did Swami Vivekananda leave for and why ?



- 4) What did Swami Vivekananda speak about at the parliament of Religion ?
  - 5) Human rights are against the government. How ?
  - 6) What is the Amnesty International ?
  - 7) Who wrote the poem 'Brahma' ?
  - 8) How did different people approach the moon in the past ?
3. A) Write short answers on **any two** of the following : **8**
- 1) What pitcher of Dr. Kalam emerges from the essay 'Work Brings Solace' ?
  - 2) How did Swami Vivekananda manage to reach Chicago ?
  - 3) Why is it difficult to defend human rights ?
- B) Answer **any two** of the following briefly : **6**
- 1) What is notice ?
  - 2) What are the aspects of good C.V. ?
  - 3) What is an e-mail ?
4. Write a suitable C.V. for the post of lecture in physics. **14**
- OR
- Write a notice, agenda and minutes for college gathering meeting.
5. Write a three paragraph e-mail letter accepting the offer of appointment letter. **14**
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**B.Sc. (ECS) – I (Semester – II) (CGPA Pattern) Examination, 2016**  
**COMPUTER SCIENCE (Paper – II)**  
**Computer Fundamentals and Programming Using C – II**

Time : 2 Hours 30 Minutes

Max. Marks : 70

**N.B. :** 1) *All questions are compulsory.*  
2) *Figures to the right place indicate full marks.*

SECTION – I  
**(Computer Fundamentals)**

1. Choose correct alternatives :

5

- 1) What is the default file extension of notepad file ?  
a) .doc                      b) .html                      c) .txt                      d) .tif
- 2) In email address \_\_\_\_\_ character is essential  
a) \_                      b) %                      c) @                      d) \*
- 3) LAN stands for  
a) Local Area Network                      b) Linear Area Network  
c) Link Area Network                      d) None of these
- 4) Font tag has following attribute  
a) Type                      b) Face  
c) Value                      d) Caption
- 5) Data transmission in which the data flow in only one direction is called  
a) Half-duplex                      b) Full duplex  
c) Simplex                      d) All of these



2. Answer **any five** of the following : 10
- 1) Explain star topology.
  - 2) What is the use of <font> tag ? Explain it with attributes.
  - 3) What is purpose of creating Hyperlink ?
  - 4) Short note on taskbar.
  - 5) Explain <hr> tag with its attributes.
  - 6) List the features of windows O.S.
  - 7) What is time sharing ?
3. A) Answer **any two** of the following : 10
- 1) Explain different types of lists used in HTML.
  - 2) Explain different features of MS-Excel.
  - 3) What is Internet ? List different uses of Internet.
- B) Answer **any one** of the following : 10
- 1) Explain while loop in Java Script with example.
  - 2) Explain multiprogramming and multiprocessing in detail.

## SECTION – II

**(Programming Using C – II)**

1. Choose correct alternatives : 5
- 1) Default storage class of local variable is
    - a) Auto
    - b) Register
    - c) Static
    - d) None of these
  - 2) What is the output ?

```
#define SQR(X) X*X
void main()
{
printf("\n%d", SQR(5));
}
```

    - a) error
    - b) 25
    - c) 29
    - d) 17



- 3) We can handle many members at a time using union
  - a) True
  - b) False
- 4) The return statement return only \_\_\_\_\_ values.
  - a) Two
  - b) Single
  - c) Many
  - d) None of these
- 5) fopen () accepts arguments.
  - a) 1
  - b) 2
  - c) 3
  - d) none of these

2. Answer **any five** of the following : **10**

- 1) What is function ? Function definition syntax.
- 2) Explain value at and address of operator.
- 3) Declaration syntax of nested structure.
- 4) What is difference between printf() and fprintf() ?
- 5) Explain static variable.
- 6) What is pointer ? Declaration syntax of pointer.
- 7) Declaration syntax of realloc ( ) function.

3. A) Solve **any two** of the following : **10**

- 1) Write a program that calculate factorial of given number using function.
- 2) Difference between dynamic and static memory allocation function.
- 3) Explain any five file handling function.

B) Solve **any one** of the following : **10**

- 1) Explain pointer arithmetic with example.
  - 2) What is structure ? Explain with example.
-





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**B.Sc. (ECS) – I (Semester – II) Examination, 2016  
(CGPA Pattern)  
Electronics (Paper – III)  
Linear and Digital Electronics – II**

Time : 2½ Hours

Total Marks : 70

- Instructions:** 1) **All questions are compulsory.**  
2) **Figures to right indicate full marks.**  
3) **Draw circuit diagram wherever necessary.**

**SECTION – I  
(Linear)**

1. Multiple choice questions :

5

- 1) \_\_\_\_\_ is voltage controller.  
a) FET                      b) BJT                      c) Capacitor                      d) Inductor
- 2) IC 741 is \_\_\_\_\_ pin IC package.  
a) 14                      b) 16                      c) 8                      d) 20
- 3) Total phase shift for sustained oscillation is \_\_\_\_\_ degree.  
a) 60                      b) 90                      c) 180                      d) 360
- 4) In single stage amplifier o/p at collector is \_\_\_\_\_  
a) In phase                      b) Out of phase  
c) In same phase                      d) None of these
- 5) Ideal o/p impedance of op-amp is \_\_\_\_\_  
a) Zero                      b) Infinity                      c) 1 k                      d) 100 k

2. Answer **any five** of the following :

10

- 1) What is mean by trans conductance ?
- 2) Define amplifier and classify based on frequency.
- 3) Explain CMRR and PSRR of op-amp.
- 4) What is function of gate and source of FET ?
- 5) How to find band width of CE amplifier ?
- 6) What is concept of offset balance ?
- 7) Give difference between Colpitt's and Hartley oscillator.

P.T.O.



3. A) Write short note on **any two** of the following : 10
- 1) Explain depletion type MOSFET.
  - 2) Explain CE amplifier.
  - 3) State phase shift oscillator.
- B) Answer **any one** of the following : 10
- 1) Explain inverting op-amp and any two applications.
  - 2) Explain astable multivibrator using IC555.

SECTION – II  
(Digital Electronics – II)

4. Multiple choice questions : 5
- 1) DRAM uses \_\_\_\_\_ to store information.  
a) resistor                      b) flip flop                      c) magnet                      d) capacitor
  - 2) All information is erased in \_\_\_\_\_ EPROM.  
a) ROM                      b) UV PROM                      c) EEPROM                      d) PROM
  - 3) Race condition occurs in RS F/F using NAND gate for input \_\_\_\_\_  
a) 0, 0                      b) 1, 1                      c) 0, 1                      d) 1, 0
  - 4) IC \_\_\_\_\_ is used as shift register.  
a) 7490                      b) 7493                      c) 7495                      d) 7474
  - 5) Toggling condition of JK F/F is nothing but \_\_\_\_\_  
a) D F/F                      b) T F/F                      c) RS F/F                      d) None of these
5. Answer **any five** of the following : 10
- 1) Draw circuit diagram of master slave JK F/F.
  - 2) Explain concept of R2R ladder network.
  - 3) Explain EEPROM.
  - 4) What is advantage of T F/F ?
  - 5) How JK F/F avoids drawback of RS F/F ?
  - 6) Draw circuit diagram of diode ROM.
  - 7) What is mean by flash ADC ?
6. A) Write short note on **any two** of the following : 10
- 1) Explain left shift register.
  - 2) Explain SRAM memory cell using BJT.
  - 3) Explain IC 7474 and IC 7475.
- B) Answer **any one** of the following : 10
- 1) Explain 3 bit asynchronous up down counter with block diagram.
  - 2) Explain RS F/F using NAND and NOR.
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**B.Sc. (ECS) – I (Semester – II) (CGPA Pattern) Examination, 2016**  
**MATHEMATICS (Paper – IV)**  
**Algebra and Operations Research**

Time : 2½ Hours

Max. Marks : 70

- Instructions:** 1) **All questions are compulsory.**  
2) **Use of scientific calculator is allowed.**  
3) **Figures to the right indicate full marks.**  
4) **Graph paper will be provided (if necessary) on demand.**

**SECTION – I (Algebra)**

1. Choose the correct alternative : 5
- 1) Which of the following is a statement ?  
a)  $10 + 4 = 16$     b)  $x < 10$     c)  $x + 4 = 9$     d)  $x^2 = 16$
  - 2) If every element of set A is related to unique element of set B then the relation is called as  
a) universal relation    b) function  
c) void relation    d) equivalence relation
  - 3) If  $*$  is binary operation on the set A and  $a * e = e * a = a$  for  $a, b, e \in A$  then element 'e' is called as \_\_\_\_\_ element.  
a) inverse    b) unique    c) identity    d) none of the above
  - 4) A relation R defined on a set A is called as \_\_\_\_\_ relation if it is reflexive, antisymmetric and transitive.  
a) equivalence    b) inverse    c) partial ordering    d) universal
  - 5) If  $z = (15 + 8i) - (12 + 4i)$  then modulus of z is  
a) 25    b) 5    c) 64    d) 7
2. Attempt **any five** of the following : 10
- 1) Define transitive closure of a relation R.
  - 2) Define bijective function.
  - 3) State first principle of finite induction.



- 4) Prepare the truth table for conjunction, disjunction, implication and double implication for the statements p and q.
- 5) Write the polar form of a complex number  $z = x + iy$ .
- 6) From the following multiplication table find the identity element and hence inverse of each element in the set A w.r.t. binary operation  $*$ .

$*$	a	b	c	d
a	d	c	b	a
b	c	d	a	b
c	b	a	d	c
d	a	b	c	d

- 7) Define converse and inverse of the conditional statement  $p \rightarrow q$ .

3. A) Attempt **any two** of the following : 10

- 1) Convert the following argument into symbolic form and test the validity by using truth table.

“If 4 is even number then 2 does not divides 5. Either 4 is even number or 2 divides 5. 4 is even number. Therefore 2 divides 5 if and only if 4 is odd (not even).”

- 2) Find real part and imaginary part of the complex number  $z = (1 - \sqrt{3}i)^4$ .

- 3) By using principle of mathematical induction prove that  $8^{n+1} - 7n + 41$  is divisible by 49, for all  $n \geq 1$ .

B) Attempt **any one** of the following : 10

- 1) Define symmetric relation and antisymmetric relation. Let R be the relation defined on the set  $A = \{p, q, r, s\}$  given by  $R = \{(p, p), (p, r), (q, p), (q, s), (r, q), (s, q), (s, r)\}$ . Find transitive closure of relation R by using Warshall's algorithm.

- 2) Let  $z_1 = a + ib$  and  $z_2 = c + id$  be the two complex numbers then show that

$$\text{i) } \overline{z_1 + z_2} = \overline{z_1} + \overline{z_2}$$

$$\text{ii) } \overline{z_1 \cdot z_2} = \overline{z_1} \cdot \overline{z_2}$$

### SECTION – II (Operations Research)

1. Choose the correct alternative : 5

- 1) The opportunity cost for occupied cells is
  - a) infinity
  - b) positive
  - c) negative
  - d) zero
- 2) The LPP is said to be in \_\_\_\_\_ form if the objective function is of maximize type and all the constraints are of  $\leq$  type.
  - a) dual
  - b) standard
  - c) canonical
  - d) general



- 3) We arrive at optimum solution of A.P. if the number of assignments made are \_\_\_\_\_ total number of rows or columns.  
a) less than      b) equal to      c)  $\leq$       d)  $\geq$
- 4) Graphical method of solving LPP is used only when the number of decision variables are  
a) 2      b) infinity      c) more than 2      d) negative
- 5) In the degenerate solution of T.P., the number of occupied cells are \_\_\_\_\_ (m + n – 1), where 'm' is number of origins and 'n' is number of destinations.  
a) equal to      b) less than      c) greater than      d) none of these

2. Attempt **any five** of the following :

10

- 1) Define un-balanced T.P.
- 2) Define non-degenerate solution of a T.P.
- 3) Convert the following A.P. of maximization type into minimization type

	A	B	C	D
P	2	10	9	7
Q	15	4	14	8
R	13	14	16	11
S	4	15	13	9

- 4) Define decision variable.
- 5) Write standard form of following LPP.  
Maximise  $z = 25x + 36y$  subject to  
 $3x + 5y \leq 4$ ;  
 $x \leq 6$ ;  
 $4x + 6y \leq 12$ ;  
 $x, y \geq 0$ .
- 6) Define balanced A.P.
- 7) Define surplus variable.

3. A) Attempt **any two** of the following :

10

- 1) Solve the following A.P. to minimize the cost.

	I	II	III	IV
A	42	35	28	21
B	30	25	20	15
C	30	25	20	15
D	24	20	16	12



2) Find IBFS of the following T.P. by using Vogel's approximation method.

	P	Q	R	S	Capacity
A	13	11	15	20	2
B	17	14	12	13	6
C	18	18	15	12	7
Demand	3	3	4	5	15

3) Write dual of the following LPP.

Maximize  $z = 2x_1 + 3x_2 + 5x_3$  subject to

$$x_1 + 4x_2 + 2x_3 \leq 4;$$

$$2x_2 + 5x_3 \leq 6;$$

$$3x_1 + 4x_2 \leq 7;$$

$$4x_1 + 6x_2 + 7x_3 \leq 9;$$

$$x_1, x_2, x_3 \geq 0.$$

B) Attempt **any one** of the following :

10

1) Solve the following A.P. to minimize the cost. Also find alternate solution if exists.

	J <sub>1</sub>	J <sub>2</sub>	J <sub>3</sub>	J <sub>4</sub>	J <sub>5</sub>
M <sub>1</sub>	–	3	6	2	3
M <sub>2</sub>	3	–	5	2	3
M <sub>3</sub>	6	5	–	6	4
M <sub>4</sub>	2	2	6	–	6
M <sub>5</sub>	3	3	4	6	–

2) Find IBFS. Hence find optimum solution of following T.P. by using MODI.

	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	W <sub>4</sub>	Capacity
F <sub>1</sub>	5	2	4	3	22
		(12)	(2)	(8)	
F <sub>2</sub>	4	8	1	6	15
			(15)		
F <sub>3</sub>	4	6	7	5	18
	(7)			(11)	
Demand	7	12	17	19	55



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**B.Sc. (ECS) (Part – I) (Semester – II) (CGPA Pattern) Examination, 2016**  
**STATISTICS (Paper – V)**  
**Descriptive Statistics and Probability Theory – II**

Time : 2½ Hours

Max. Marks : 70

- N.B. :*** 1) **Use** single answerbook for Section – I and II.  
2) Figures to **right** indicates **full** marks.  
3) **Use** of **any** type of calculator is **allowed**.

**SECTION – I**  
**(Descriptive Statistics)**

1. Choose most correct alternative :

5

- 1) If  $\text{Corr}(X, Y) = 0.4$ , then  $\text{Corr}(2X, 2Y) =$  \_\_\_\_\_  
a) 0.4    b) 0.8  
c) 0.2    d) None of these
- 2) The equations of lines of regression Y on X and X on Y are  $Y - 1.5x = 0$  and  $10x - 5y = 25$  respectively, then estimated value of Y for  $X = 1$  is \_\_\_\_\_  
a) 1.5    b) - 1.5    c) - 3    d) 3
- 3) The partial regression coefficient \_\_\_\_\_ denotes the change in value of  $X_1$  per unit change in  $X_3$ .  
a)  $b_{12.3}$     b)  $b_{13.2}$   
c)  $b_{23.1}$     d) None of these
- 4) The variation in time series, due to weekly bazar is known as \_\_\_\_\_  
a) Trend    b) Seasonal variation  
c) Cyclical variation    d) None of these
- 5) Index No. is an application of \_\_\_\_\_  
a) Averages    b) Dispersion  
c) Correlation    d) Regression



2. Attempt **any five** : 10

- 1) Define – perfect negative correlation.
- 2) Define – Index No.
- 3) Given :  $n = 10$ ,  $\text{Cov}(X, Y) = -15$ ,  $\sum(X - \bar{X})^2 = 205$ ,  $\sum(Y - \bar{Y})^2 = 255$ . Find correlation coefficient between X and Y.
- 4) Given :  $b_{yx} = 1.6$ ,  $\text{Cov}(X, Y) = 256$ . Find variance of X.
- 5) Given :  $\sum p_1 q_1 = 18$ ,  $\sum p_0 q_1 = 10$ ,  $\sum p_0 q_0 = 15$ . Find appropriate price index no.
- 6) Given :  $\sigma_1 = 35$ ,  $\sigma_3 = 45$ ,  $r_{12} = r_{13} = r_{23} = 0.7$ , find partial regression coefficient  $b_{13.2}$ .
- 7) State any two causes of seasonal variation.

3. A) Attempt **any two** : 10

- 1) Define : Time series. Explain utility of it.
- 2) Compute Spearman's rank correlation coefficient between X and Y.
 

X :	70	62	63	50	54	80	75
Y :	60	54	48	60	54	40	39
- 3) Given :  $n = 15$ ,  $\sum X = 90$ ,  $\sum Y = 165$ ,  $\sum Y^2 = 2940$ ,  $\sum XY = 1644$ , obtain equation of line of regression X on Y and hence estimate X for Y = 15.

B) Attempt **any one** : 10

- 1) Explain concept of multiple and partial correlation. State formula for  $R_{1.23}$ ,  $r_{12.3}$ .
- 2) Find Laspeyre's Paasche's and Fisher's price and Quantity Index No. for year 2005.

Commodity	Year 2005		Year 2004	
	Price	Qty.	Price	Qty.
A	200	25	175	30
B	150	10	142	11
C	450	5.5	413	6



SECTION – II  
(Probability Theory – II)

4. Choose most correct alternative :

5

1) If X is continuous r.v. with pdf f(X). Then  $\int_{-\infty}^{\infty} X^2 \cdot f(X)dX$  is \_\_\_\_\_

- a) V(X)
- b)  $V(X) + [E(X)]^2$
- c)  $E(X^2)$
- d) None of these

2) If  $X \rightarrow U[4 ; 16]$ . Then  $V(X) =$  \_\_\_\_\_

- a) 20
- b) 12
- c) 10
- d) 16

3) If (x ; y) be bivariate independent r.v. then  $Cov(x ; y) =$  \_\_\_\_\_

- a) Positive
- b) Zero
- c) Negative
- d) None of these

4) If  $X \rightarrow N(\mu = 50 ; \sigma^2 = 16)$ . Then maximum height of its pdf curve is \_\_\_\_\_

- a) 60
- b) 50
- c) 16
- d) None of these

5) If  $X \rightarrow \text{Exp}(\theta = 1)$ . Then  $P(X > 2)$  is \_\_\_\_\_

- a)  $e^2$
- b)  $e^{-2}$
- c)  $1 + e^{-2}$
- d)  $1 + e^2$

5. Attempt **any five** :

10

- 1) Define exponential distribution.
- 2) Define null and alternative hypothesis.
- 3) Let  $X \rightarrow U[0, 10]$ . Find  $P(X \leq 3)$ .
- 4) Define pdf of continuous r.v.X.
- 5) Let X be a continuous r.v. with pdf  $f(X) = K(X - 1)^2$  if  $1 \leq X \leq 3$ . Find value of K.
- 6) The joint pmf of (X ; Y) is  
$$P(X ; Y) = K(2X + 3Y) \text{ if } X = 2, 4, 6$$
$$Y = 3, 5, 7$$
  
Find value of K.
- 7) Define normal distribution.



6. A) Attempt **any two** :

10

1) Life length of computers of certain company follows exponential distribution with average life 360 hours. What is probability that the computer will operate for 180 hours or less ?

2) If  $X \rightarrow U[a ; 10]$  and  $P(3 < X < 7) = \frac{1}{2}$ . Find value of a

3) The pdf of r.v.X is

$$f(X) = 3X^2 \text{ if } 0 \leq X \leq 1 \\ = 0 \text{ if o.w.}$$

Find mean, variance and distribution function of X.

B) Attempt **any one** :

10

1) The joint pmf of a two dimensional discrete r.v. (X ; Y) is

$$P(X ; Y) = K(5X + 3Y) \text{ if } X = 1, 2, 3 \\ Y = 0, 1, 2$$

Find :

i) Value of K

ii)  $E(X)$

iii)  $E(Y)$

iv)  $E(X.Y)$

v) Verify whether X and Y are independent or not.

2) Define level of significance and write test procedure for testing equality of two population means.

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**B.Sc. (ECS) II (Semester – III) (CGPA) Examination, 2016  
OPERATING SYSTEM (Paper – I)**

Time : 2½ Hours

Max. Marks : 70

**Instructions :** 1) *All questions are compulsory.*  
2) *All questions carry equal marks.*

1. Choose correct alternatives : **14**

1) To avoid the race condition, the number of processes that may be simultaneously inside their critical section is

- A) 8                      B) 1                      C) 16                      D) 0

2) Process is

- A) Program in High level language kept on disk  
B) Contents of main memory  
C) A program in execution  
D) A job in secondary memory

3) The strategy of allowing processes that are logically runnable to be temporarily suspended is called

- A) Preemptive scheduling                      B) Non preemptive scheduling  
C) Shortest job first                      D) First come first served

4) Fork is

- A) The dispatching of a task                      B) The creation of a new job  
C) The creation of a new process                      D) Increasing the priority of a task

5) Supervisor state is

- A) Entered by programs when they enter the processor  
B) Required to perform any I/O  
C) Only allowed to the operating system  
D) None of the these

6) The FCFS algorithm

- A) Executes first the job that last entered the queue  
B) Executes first the job that first entered the queue  
C) Execute first the job that has been in the queue the longest  
D) Executes first the job with the least processor needs



- 7) What is the name given to the organized collection of software that controls the overall operation of a computer ?
- A) Working system
  - B) Peripheral system
  - C) Operating system
  - D) Controlling system
- 8) System generation
- A) Is always quite simple
  - B) Is always very difficult
  - C) Requires extensive tools to be understandable
  - D) Varies in difficulty between systems
- 9) What is the name of the technique in which the operating system of a computer executes several programs concurrently by switching back and forth between them ?
- A) Partitioning
  - B) Multitasking
  - C) Windowing
  - D) None of the above
- 10) Operating system
- A) Links a program with the subroutines and its references
  - B) Provides a layered, user-friendly interface
  - C) Enables the programmer to draw a flowchart
  - D) All of the above
- 11) Software that measures, monitors, analyzes and controls real-world events is called
- A) Business software
  - B) Real-time software
  - C) Scientific software
  - D) None of the above
- 12) A processor
- A) Is a device that performs a sequence of operations specified by instructions in memory
  - B) Is the device where information is stored
  - C) Is a sequence of instructions
  - D) Is typically characterized by interactive processing and time of the CPU's time to allow quick response to each user



13) Multiprogramming

- A) Is a method of memory allocation by which the program is subdivided into equal portions, or pages and core is subdivided into equal portions or blocks
- B) Consists of those addresses that may be generated by a processor during execution of a computation
- C) Is a method of allocating processor time
- D) Allows multiple programs to reside in separate areas of core at the time

14) Which is not the state of the process ?

- A) Blocked
- B) Running
- C) Ready
- D) Privileged

2. Solve **any seven** : **14**

- 1) Define real time operating system.
- 2) Which two basic operations perform on process ?
- 3) What is layered system ?
- 4) What do you mean by virtual machine ?
- 5) What is naming ?
- 6) What is meant by batch operating system ?
- 7) List out the any four major categories of system call.
- 8) What is meant by cooperating process ?

3. A) Solve **any two** : **8**

- 1) Explain multiprogramming operating system and time sharing operating system.
- 2) Explain process control block.
- 3) Explain in detail different services provided by operating system.

B) Explain the main components of OS in detail. **6**

4. Solve **any two** : **14**

- 1) Explain multilevel queue scheduling with example.
- 2) Explain Shortest Job First (SJF) algorithm with example.
- 3) Define a process schedule and explain process scheduling queues with its appropriate diagram.

5. Solve **any two** : **14**

- 1) Explain critical section problem and its solutions in detail.
  - 2) Explain Round Robin algorithm with example.
  - 3) Explain semaphores in detail.
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**B.Sc. (ECS) – II (Semester – III) (CGPA) Examination, 2016**  
**Paper – II : OBJECT ORIENTED PROGRAMMING USING C++ – I**

Time : 2 Hours 30 Minutes

Max. Marks : 70

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose correct alternatives :

14

- 1) Execution of destructor depends on number of \_\_\_\_\_ for class.  
a) constructors    b) objects    c) both a and b    d) none of these
- 2) \_\_\_\_\_ binds data and functions together.  
a) Polymorphism    b) Data Abstraction  
c) Data Encapsulation    d) Class
- 3) Friend function can be defined inside class body.  
a) True    b) False
- 4) \_\_\_\_\_ operator is overloaded using member function only.  
a) +    b) –    c) =    d) ==
- 5) POP follows \_\_\_\_\_ approach.  
a) Bottom up    b) Top down    c) Both a and b    d) None of these
- 6) \_\_\_\_\_ is a default parameter passing technique in C++.  
a) Pass by value    b) Pass by pointer  
c) Pass by address    d) Both a and b
- 7) Destructor cannot virtual whereas constructors are virtual.  
a) True    b) False
- 8) When function is called then \_\_\_\_\_ function can be pushed into system stack by compiler.  
a) friend    b) inline    c) non inline    d) both b and c
- 9) We can overload 'new' and 'delete' operator.  
a) True    b) False

P.T.O.



- 10) Static member functions can access non static data of class directly.  
a) True                      b) False
- 11) ++ a is equivalent to  
a) a = a + 2              b) a + 1                      c) a = a + 1              d) a + 2
- 12) Compile time polymorphism is achieved by  
a) function overloading                      b) operator overloading  
c) virtual function                      d) both a and b
- 13) The single copy of \_\_\_\_\_ data of class is common to all objects.  
a) inline                      b) friendly                      c) static                      d) both a and b
- 14) The default memory allocation done in C++ is  
a) compile time      b) runtime                      c) dynamic                      d) both b and c

2. Answer **any seven** of the following :

**14**

- 1) Define Manipulator and list out parameterized manipulators in C++.
- 2) Write difference between pointer variable and reference variable.
- 3) What is local classes ?
- 4) Write syntax and use of 'typedef' keyword.
- 5) What is nesting of member function ?
- 6) Write difference between C++ class and structure.
- 7) Explain Inheritance as OOP's concept.
- 8) Write some applications of C++ language.
- 9) What is dynamic constructor ?

3. A) Attempt **any two** of the following :

**10**

- 1) Write an object oriented program which prints first five prime numbers.
- 2) What is operator overloading ? List out rules to overload the operator and give one example to overload any binary operator.
- 3) Write a program that demonstrate the use of multiple constructors in a class.

B) How will you store multiple records in single object ? Explain it with suitable example.

**4**



4. Answer **any two** of the following : **14**
- 1) Write an object oriented program that counts total number of objects created for class.
  - 2) What is constructor ? Explain all types of constructor's in detail.
  - 3) Write an object oriented menu driven program that performs following bank transactions.
    - 1) Create account
    - 2) Deposit amount
    - 3) Withdraw amount
    - 4) Account summary
5. Answer **any two** of the following : **14**
- 1) Write a program to overload ++ operator to check entered number is perfect or not.
  - 2) Write a program that demonstrate the use of friend class.
  - 3) What is type conversion ? Explain implicit and explicit type conversion with one example.
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**B.Sc. (E.C.S.) – II (Semester – III) (CGPA) Examination, 2016  
(Paper – III) : DATA STRUCTURES AND ALGORITHMS**

Time : 2½ Hours

Max. Marks : 70

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose correct alternatives :

14

- 1) Find odd man out
  - a) Array
  - b) Stack
  - c) Queue
  - d) Tree
- 2) Linear Linked list have NULL pointer
  - a) True
  - b) False
- 3) If front = rear then queue is
  - a) Full
  - b) Empty
  - c) Non-Full
  - d) Non-Empty
- 4) \_\_\_\_\_ algorithm works by breaking down a main problem into two or more sub-problems.
  - a) Branch and bound
  - b) Greedy
  - c) Divide and conquer
  - d) None of these
- 5) Attempting to remove element from empty stack results
  - a) Overflow
  - b) Underflow
  - c) Both a) and b)
  - d) None of these
- 6) \_\_\_\_\_ type of queue allows insertion and deletion in both ends.
  - a) Linear
  - b) Circular
  - c) Priority
  - d) Deque
- 7) If an array having 'n' size then its last element is stored at \_\_\_\_\_ index.
  - a) n + 1
  - b) n – 1
  - c) n
  - d) n + 2

P.T.O.



- 8) Node of \_\_\_\_\_ linked list contains two parts.
- a) Singly
  - b) Doubly
  - c) Both a) and b)
  - d) None of these
- 9) The amount of time taken by the program for execution is called \_\_\_\_\_ complexity.
- a) Space
  - b) Memory
  - c) Time
  - d) Both a) and b)
- 10) Static memory allocation by means of \_\_\_\_\_ memory allocation.
- a) Compile time
  - b) Run time
  - c) Dynamic
  - d) Both b) and c)
- 11) In ascending priority queue \_\_\_\_\_ element has highest priority among all elements.
- a) Smallest
  - b) Largest
  - c) Second Largest
  - d) Second Smallest
- 12) \_\_\_\_\_ data structure is useful in sub routine call.
- a) Stack
  - b) Queue
  - c) Linked List
  - d) Both a) and b)
- 13) \_\_\_\_\_ algorithm is useful to solve Traveling Salesman Problem (TSP).
- a) Greedy
  - b) Branch and bound
  - c) Dynamic programming
  - d) None of these
- 14) Which of the following is not the part of ADT description ?
- a) Data
  - b) Operations
  - c) Both of the above
  - d) None of the above

2. Answer **any seven** of the following :

14

- 1) Define 'Data structure' and write its application.
- 2) Why stack is called LIFO data structure ?
- 3) What is Header node ? Write its importance in linked list.
- 4) Why linked list is flexible than stack and queue ?
- 5) Define 'two dimensional' array and write its declaration syntax.





- 6) What is time and space complexity ?
  - 7) What is Queue ? List out its several applications.
  - 8) What is Doublycircular linked list ?
  - 9) What is static and dynamic memory allocation ?
3. A) Attempt **any two** of the following : **10**
- 1) Implement function that reverses doubly linear linked list.
  - 2) Write an algorithm that converts infix expression to postfix expression.
  - 3) What is priority queue ? Explain the linked representation of priority queue.
- B) What is Input Restricted Deque ? Implement its `remove_left()` operation. **4**
4. Answer **any two** of the following : **14**
- 1) Write a program to implement linear queue.
  - 2) Explain Greedy and dynamic programming algorithms with their applications.
  - 3) What is ADT ? Explain ADT for stack.
5. Answer **any two** of the following : **14**
- 1) Write a program that reverses the entered string using stack.
  - 2) Explain following operations of doubly linear linked list :
    - a) `insert_last()`
    - b) `search()`
  - 3) Write a program that find sum of odd and sum of even numbers between array elements.
-



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**B.Sc. (ECS) – II (Semester – III) (CGPA) Examination, 2016**  
**COMPUTER SCIENCE (Paper – IV)**  
**Software Engineering – I**

Time : 2 Hours 30 Minutes

Total Marks : 70

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternatives :

14

- 1) \_\_\_\_\_ is the main source of external elements.  
a) Control                      b) Feedback              c) Environment              d) Boundaries
- 2) Operators are the interface between user and programmer in system development.  
a) True                                      b) False
- 3) \_\_\_\_\_ technique is used to collect the information from the individuals or from groups.  
a) Interview                                      b) Questionnaire  
c) Record review                                      d) Observation
- 4) Primary goal of software engineering is to improve the \_\_\_\_\_.  
a) Technique                                      b) Quality  
c) Both a and b                                      d) None of these
- 5) Cost-Benefit analysis is performed during \_\_\_\_\_.  
a) Analysis phase                                      b) Design phase  
c) Feasibility study phase                                      d) Implementation phase
- 6) Actual programming of software code is done during the design phase in the SDLC.  
a) True                                      b) False



- 7) Prototyping is appropriate for \_\_\_\_\_
- a) Data-oriented applications
  - b) Applications with emphasis on the user interface
  - c) Applications which are highly interactive
  - d) All of the above
- 8) The inter-connection and interaction between the subsystems are called as \_\_\_\_\_
- a) Control
  - b) Boundaries
  - c) Interfaces
  - d) Environment
- 9) SDLC stands for \_\_\_\_\_
- a) System Development Life Cycle
  - b) Structure Design Life Cycle
  - c) System Design Life Cycle
  - d) Structure Development Life Cycle
- 10) In fact-finding technique questionnaire is most useful for collecting quantitative data.
- a) True
  - b) False
- 11) The part of a decision table that lists the conditions relevant to the decision is called \_\_\_\_\_
- a) action entries
  - b) condition entries
  - c) condition list
  - d) condition execution
- 12) \_\_\_\_\_ is the technical skill required in the system analyst.
- a) Understanding
  - b) Drawing
  - c) Creativity
  - d) Operations
- 13) Maintenance cost is technical feasibility study.
- a) True
  - b) False
- 14) A decision table contains \_\_\_\_\_
- a) Condition
  - b) Action
  - c) Action entry
  - d) All of these

2. Solve **any seven** of the following :

14

- 1) What is record review ?
- 2) What is system analysis ?
- 3) Define Software Engineering.



- 4) Give the need of decision table.
  - 5) What is the meaning of positive feedback ?
  - 6) Define system.
  - 7) What is HIPO ?
  - 8) Give the advantage of prototyping.
  - 9) What are the uses of flowcharts ?
3. A) Attempt **any two** of the following : **10**
- 1) Explain the feasibility study with suitable example.
  - 2) Give the role of system analyst.
  - 3) Define deterministic and probabilistic system with example.
- B) Write note on advantages of waterfall model. **4**
4. Attempt **any two** of the following : **14**
- 1) Write note on :
    - i) Reusability
    - ii) Portability
    - iii) Interoperability
  - 2) Draw system flowchart for result processing system.
  - 3) Distinguish between system analysis and system design.
5. Attempt **any two** of the following : **14**
- 1) Explain the characteristics of software.
  - 2) Explain decision table with suitable example.
  - 3) Discuss in detail "Spiral Model".
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**B.Sc. (ECS) – II (Semester – III) (CGPA) Examination, 2016  
ELECTRONICS (Paper – V)  
Organization of PC**

Time : 2½ Hours

Max. Marks : 70

1. Choose and write a correct answer from given alternatives. 14

- 1) \_\_\_\_\_ printer is impact printer.
  - a) Laser
  - b) Daisy wheel
  - c) Inkjet
  - d) Thermal
- 2) The control unit and ALU are collectively called
  - a) PC
  - b) CPU
  - c) Accumulator
  - d) Register
- 3) \_\_\_\_\_ technique allows detection of multiple bits.
  - a) Parity check
  - b) CRC
  - c) Odd parity bit
  - d) Even parity bit
- 4) Keyboard use \_\_\_\_\_ mode for data transfer.
  - a) Programmed
  - b) Interrupt
  - c) DMA
  - d) I/O mode
- 5) Which of the following support multiprogramming and virtual memory ?
  - a) PC-AT
  - b) PC
  - c) PC-XT
  - d) All above
- 6) Fetching of an instruction is done by \_\_\_\_\_ unit.
  - a) ALU
  - b) Control
  - c) Memory
  - d) INPUT
- 7) In microprocessor address bus is \_\_\_\_\_
  - a) Uni-directional
  - b) Bi-directional
  - c) Non-directional
  - d) None of above



- 8) \_\_\_\_\_ RAM is made from flip-flop.  
a) Dynamic      b) Static      c) Virtual      d) Both a) and b)
- 9) In the keyboard which key is pressed and generates the corresponding code is known as \_\_\_\_\_  
a) Encoding                      b) Decoding  
c) Multiplexing                      d) Demultiplexing
- 10) Single density recording format is called \_\_\_\_\_  
a) MFM      b) FM      c) MF      d) All above
- 11) Speed of printing page of printer is measured in \_\_\_\_\_  
a) RPM      b) NLQ      c) LQ      d) PPM
- 12) The basic architecture of initial PC is backbone of \_\_\_\_\_  
a) IBM      b) AMD      c) DELL      d) HCL
- 13) Instruction cycle consist of \_\_\_\_\_  
a) Fetch      b) Decode      c) Execute      d) All above
- 14) In \_\_\_\_\_ communication signal can be passed in both direction simultaneously.  
a) Simplex      b) Duplex      c) Half duplex      d) Full duplex

2. Solve **any seven** of the following :

**14**

- 1) What is booting ?
- 2) Write the names of OG and NG interrupts.
- 3) Draw the block diagram of CRT.
- 4) What is pit and land ?
- 5) Explain function of program counter.
- 6) What is an interrupt ?
- 7) Draw the block diagram of control unit.
- 8) What is OS ?
- 9) Explain difference between PC-AT and PC-XT.



3. A) Attempt **any two** of the following : **10**
- 1) What is mouse ? Explain its type.
  - 2) Explain programmed I/O.
  - 3) Write a note on SMPS.
- B) Explain data transfer technique in burst and cycle stealing mode. **4**
4. Attempt **any two** of the following : **14**
- 1) Explain working of inkjet printer.
  - 2) Explain bus concept.
  - 3) Explain parity check error detection technique.
5. Attempt **any two** of the following : **14**
- 1) Explain function of modem in detail.
  - 2) Explain control signal in detail.
  - 3) State working of sound card and network interface card.
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**B.Sc. (ECS) – II (Semester – III) (CGPA) Examination, 2016**  
**ELECTRONICS**  
**Microprocessors – I (Paper – VI)**

Time : 2 Hours 30 minutes

Total Marks : 70

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right place indicate full marks.*

1. Multiple choice questions. 14

- 1) Cache is \_\_\_\_\_ memory introduced between CPU and main memory.
  - a) Low speed
  - b) High speed
  - c) Moderate speed
  - d) a and b both
- 2) Flag register are group of flip flop which shows \_\_\_\_\_ of operation.
  - a) Back status
  - b) Advance status
  - c) Current status
  - d) both a and c
- 3) In DMA data transfer done \_\_\_\_\_ help of microprocessor.
  - a) with
  - b) without
  - c) both a and b
  - d) none of these
- 4) In dynamic memory data is stored in \_\_\_\_\_.
  - a) Transistor
  - b) FET
  - c) Diode
  - d) Capacitor
- 5) \_\_\_\_\_ is specialized IC which takes care of I/O operation in processor.
  - a) 8085
  - b) 8087
  - c) 8089
  - d) none of these
- 6) \_\_\_\_\_ addressing mode generally used zero byte instructions.
  - a) Implied
  - b) Register
  - c) Direct
  - d) Immediate
- 7) \_\_\_\_\_ is a register which stores the address of next instruction which is to be executed next.
  - a) Stack pointer
  - b) Program counter
  - c) General purpose
  - d) None of these







3. A) Answer **any two** of the following : 10
- 1) Explain types of instruction format.
  - 2) Explain memory organization in processor.
  - 3) Explain input output processor.
- B) Write short note on Bit slice processor. 4
4. Attempt **any two** of the following : 14
- 1) Explain stack organization.
  - 2) Explain associative memory.
  - 3) Explain characteristics of memory system.
5. Attempt **any two** of the following : 14
- 1) Explain types of addressing modes in microprocessor.
  - 2) Explain modes of data transfer in short.
  - 3) Write short note on virtual memory management.
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**B.Sc. (E.C.S.) – II (Semester – IV) (Old) Examination, 2016**  
**COMPUTER SCIENCE**  
**Paper – I : Operating System – II**

Time : 2 Hours

Total Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternatives : **10**
- 1) In Unix, which system call creates the new process ?  
a) fork                      b) create                      c) new                      d) none of the above
  - 2) Which one of the following is the deadlock avoidance algorithm ?  
a) Banker's algorithm                      b) Round-Robin algorithm  
c) Elevator algorithm                      d) Karn's algorithm
  - 3) Which of the following is not the state of a process ?  
a) New                      b) Old                      c) Waiting                      d) Running
  - 4) The Process Control Block is  
a) Process type variable                      b) Data structure  
c) A secondary storage section                      d) A block in memory
  - 5) Virtual memory is \_\_\_\_\_  
a) An extremely large main memory  
b) An extremely large secondary memory  
c) An illusion of extremely large main memory  
d) A type of memory used in super computers
  - 6) Unix Operating System is an \_\_\_\_\_  
a) Time Sharing Operating System  
b) Multi-User Operating System  
c) Multi-tasking Operating System  
d) All the above
  - 7) Which is not the state of the process ?  
a) Blocked                      b) Running                      c) Ready                      d) Privileged

P.T.O.



- 8) File type can be represented by
- a) File name
  - b) File extension
  - c) File identifier
  - d) None of the mentioned
- 9) To create a file
- a) Allocate the space in file system
  - b) Make an entry for new file in directory
  - c) Both a) and b)
  - d) None of the mentioned
- 10) A tree structured file directory system
- a) Allows easy storage and retrieval of file names
  - b) Is a much debated unnecessary feature
  - c) Is not essential when we have millions of files
  - d) None of the above

2. Answer **any five** of the following : **10**
- 1) Define Kernel.
  - 2) Define file naming.
  - 3) What is swapping ?
  - 4) What is demand paging ?
  - 5) What is a file ?
  - 6) What is meant by Buffering ?
3. A) Answer **any two** of the following : **6**
- 1) What is deadlock ? Explain the necessary conditions for deadlock.
  - 2) Explain architecture of unix operating system.
  - 3) Explain advantages and disadvantages of buffer cache.
- B) Explain types of File. **4**
4. Answer **any two** of the following : **10**
- 1) Explain deadlock detection and recovery.
  - 2) Explain Virtual memory.
  - 3) Explain Process states and transitions.
5. Answer **any two** of the following : **10**
- 1) Explain Bankers algorithm with example.
  - 2) What is paging ? Explain in detail.
  - 3) Explain Access methods in file.
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**B.Sc. (ECS) – II (Semester – IV) (Old) Examination, 2016  
COMPUTER SCIENCE**

**Paper – II : Object Oriented Programming Using C++ – II**

Time : 2 Hours

Max. Marks : 50

**N.B. :** 1) **All questions are compulsory.**  
2) **Figures to the right indicates full marks.**

1. Select the correct alternatives :

10

- 1) Which of the following statements is correct ?
  - a) Base class pointer cannot point to derived class
  - b) Derived class pointer cannot point to base class
  - c) Pointer to derived class cannot be created
  - d) Pointer to base class cannot be created
- 2) A reference variable must be initialized at the time of declaration.
  - a) True
  - b) False
- 3) The mechanism of deriving a class from another 'derived class' is known as
  - a) Multilevel Inheritance
  - b) Multiple Inheritance
  - c) Hybrid Inheritance
  - d) Hierarchical Inheritance
- 4) Which one of the following is the correct way to declare a pure virtual function ?
  - a) *Virtual void Display(void) {0}*
  - b) *Virtual void Display= 0*
  - c) *Virtual void Display(void) = 0*
  - d) *Void Display(void) = 0*
- 5) '<<' is called extraction operator.
  - a) True
  - b) False
- 6) When a base class is privately inherited by a derived class then public members of base class become \_\_\_\_\_ of the derived class.
  - a) Private
  - b) Public
  - c) Protected
  - d) None of these
- 7) How many types of polymorphisms are supported by C++ ?
  - a) 1
  - b) 2
  - c) 3
  - d) 4

P.T.O.



- 8) A virtual function can not be a friend of another class.  
a) True   b) False
- 9) Which of the following cannot be used with the keyword *virtual*?  
a) Class   b) Member function  
c) Constructor   d) Destructor
- 10) A pointer can be incremented or decremented.  
a) True   b) False

2. Answer the following (**any 5**): 10

- 1) What does inheritance mean in C++ ?
- 2) What is virtual base class ?
- 3) State any four rules for operator overloading.
- 4) What are the different manipulators used in C++ ?
- 5) Define multilevel inheritance with example.
- 6) Define operator overloading.

3. A) Answer **any two** of the following : 6

- 1) Explain the term pointer to object.
- 2) Describe virtual function.
- 3) Explain C++ stream classes.

B) Explain read() and write() function in file handling with example. 4

4. Answer **any two** of the following : 10

- 1) Write a program to accept information of five students (roll number, name and marks) and display it on screen using array of objects.
- 2) What is virtual function ? Explain the rules for virtual function.
- 3) What is inheritance ? Write a program for hybrid inheritance.

5. Answer **any two** of the following : 10

- 1) What does *this* pointer point to ? Explain with example.
  - 2) Explain multiple inheritance with example. What is ambiguity in multiple inheritance.
  - 3) What is the role of pure virtual function ? Explain with example.
-





- 9) The number of branches attached to particular node is called degree of node.
  - a) True
  - b) False
- 10) Quick sort it is also known as partition exchange sort.
  - a) True
  - b) False
- 2. Answer **any five** of the followings : **10**
  - 1) Write advantages of threaded binary tree.
  - 2) What is binary expression tree ?
  - 3) List out applications of binary tree.
  - 4) Define sorting and list out the different sorting techniques.
  - 5) Define the terms :
    - I) Ancestors
    - II) Descendants.
  - 6) What are the applications of Graph ?
- 3. A) Attempt **any two** of the followings : **6**
  - 1) Explain node insertion process in B-tree.
  - 2) Explain Quick sort with example.
  - 3) Explain different Hash functions with example.
- B) Differentiate between linear search and binary search. **4**
- 4. Answer **any two** of the followings : **10**
  - 1) Explain height balanced tree in detail.
  - 2) Write a function to implement bubble sort.
  - 3) Write a function to implement binary search method.
- 5. Answer **any two** of the followings : **10**
  - 1) What is binary search tree ? Explain its types in detail.
  - 2) Explain BFS Graph traversal method in detail.
  - 3) Write a program to implement insertion sort.





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**B.Sc. (ECS) – II (Semester – IV) (Old) Examination, 2016**  
**COMPUTER SCIENCE**  
**Paper – IV : Software Engineering – II**

Time : 2 Hours

Max. Marks : 50

- N.B. :** 1) **All questions are compulsory.**  
2) Figures to **right** place indicate **full** marks.

1. Choose the correct alternative : **10**
- 1) All of the following tools are used for process descriptions except
    - a) Structured English
    - b) Decision tables
    - c) Pseudocode
    - d) Data dictionaries
  - 2) A graphic representation of an information system is called
    - a) Flow chart
    - b) Pictogram
    - c) Data flow diagram
    - d) Histogram
  - 3) A data dictionary is usually developed
    - a) At requirements specification phase
    - b) During feasibility analysis
    - c) When DFD is developed
    - d) When a database is designed
  - 4) A data element in a data dictionary may have
    - a) Only integer value
    - b) No value
    - c) Only real value
    - d) Only decimal value
  - 5) The primary tool used in structured design is a
    - a) Structure chart
    - b) Program flowchart
    - c) Module
    - d) None of the above



- 6) Structured charts are a product of
- Requirements gathering
  - Requirements analysis
  - Design
  - Coding
- 7) External entities may be a
- Source of input data only
  - Source of input data or destination of results
  - Destination of results only
  - Repository of data
- 8) Data store in a DFD represents.
- A sequential file
  - A disk store
  - A repository of data
  - A random access memory
- 9) A data cannot flow between a store and
- a store
  - a process
  - an external entity
- i) and iii)
  - i) and ii)
  - ii) and iii)
  - ii)
- 10) Graphic representation of the control logic of processing functions or modules representing a system, is known as
- Structured analysis
  - Structured chart
  - Structured English
  - System flow chart

2. Answer **any five** of the following :

10

- 1) What is Parallel Changeover ?
- 2) What is structured English ?
- 3) What is data dictionary ?



- 4) What is meant by change over ?
  - 5) What are the different tools used in structured design ?
  - 6) What are the advantages of HIPO ?
  - 3. A) Solve **any two** : **6**
    - 1) What is normalization ? Explain 3NF.
    - 2) Differentiate between logical and physical DFD.
    - 3) Define the terms entity, relationship, attributes.
  - B) What are the objectives of testing ? **4**
  - 4. Solve **any two** : **10**
    - 1) List out the possible errors of Black Box Testing.
    - 2) Describe the architecture of CASE tools with diagram.
    - 3) Create data dictionary for college admission system.
  - 5. Solve **any two** : **10**
    - 1) What is the weakness of case tool ?
    - 2) What is data capture ? State its objectives.
    - 3) Write a short note on case repository.
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**B.Sc. (ECS) – II (Semester – IV) Examination, 2016  
MICROPROCESSORS – II (Old) (Paper – VI)**

Time : 2 Hours

Marks : 50

**Instructions :** i) **All** questions are **compulsory** and carry **equal** marks.  
ii) Draw neat diagrams **wherever** necessary.

1. Multiple choice questions.

10

- 1) Virtual memory of 80386 is  
a) 64 TB                      b) 4 GB                      c) 64 GB                      d) 64 KB
- 2) \_\_\_\_\_ is arithmetic instruction.  
a) ANI                      b) CLI                      c) CWB                      d) STI
- 3) 8253 is \_\_\_\_\_ pin IC.  
a) 24                      b) 40                      c) 20                      d) 16
- 4) Pentium processor is introduced in  
a) 1992                      b) 1991                      c) 1994                      d) 1993
- 5) 8257 is  
a) PPI                      b) PTC                      c) DMA                      d) DAM
- 6) 80486 has \_\_\_\_\_ bit flag register.  
a) 32                      b) 16                      c) 8                      d) 20
- 7) Operating speed of 80286 is \_\_\_\_\_ MHz.  
a) 20                      b) 10                      c) 2.5                      d) 66
- 8) 8255 has \_\_\_\_\_ no. of I/O ports.  
a) 2                      b) 3                      c) 8                      d) 4
- 9) STC is \_\_\_\_\_ instruction.  
a) arithmetic                      b) data transfer                      c) logical                      d) processor
- 10) \_\_\_\_\_ is bit manipulation instruction.  
a) TEST                      b) AAA                      c) CMP                      d) NEG

P.T.O.



2. Answer **any five** of the following. 10
- a) Explain rotate type instruction.
  - b) Explain features of Pentium pro.
  - c) Explain two modes of 8253.
  - d) Explain AAA and AAS.
  - e) Explain mode set register of 8237.
  - f) Explain two flags of 32 bit processor.
3. A) Answer **any two** of the following. 6
- 1) Explain shift instruction.
  - 2) Explain memory mapped I/O.
  - 3) Write program to arrange data in descending order.
- B) Explain linear select address decoding. 4
4. Attempt **any two** of the following. 10
- 1) Explain 8255 with block diagram.
  - 2) Explain registers of 32 bit processor.
  - 3) Explain control word of 8253.
5. Attempt **any two** of the following. 10
- 1) Compare features of 80286 and 80486.
  - 2) Explain program control instruction.
  - 3) Explain addressing modes of 32 bit processor.
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**B.Sc. (ECS) – II (Semester – IV) (New CGPA) Examination, 2016**  
**Paper – I : OPERATING SYSTEM – II**

Time : 2½ Hours

Max. Marks : 70

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose correct alternatives :

14

- 1) The circular wait condition can be prevented by \_\_\_\_\_
  - a) Defining a linear ordering of resource types
  - b) Using thread
  - c) Using pipes
  - d) All of the mentioned
- 2) Which one of the following is the deadlock avoidance algorithm ?
  - a) Banker's algorithm
  - b) Round-Robin algorithm
  - c) Elevator algorithm
  - d) Karn's algorithm
- 3) \_\_\_\_\_ is a unique tag, usually a number, identifies the file within the file system.
  - a) File name
  - b) File identifier
  - c) File type
  - d) None of the mentioned
- 4) In UNIX, even an 'empty' disk has a percentage of its space lost to \_\_\_\_\_
  - a) Programs
  - b) Inodes
  - c) Virtual memory
  - d) Stacks
- 5) In UNIX operating system, terminated state of process is also called \_\_\_\_\_
  - a) Finish
  - b) Exit
  - c) Zombie
  - d) None of these
- 6) The process zero is called as \_\_\_\_\_ process.
  - a) Swapper
  - b) Init
  - c) New
  - d) Final



- 7) In UNIX the operating system also called as Kernel.
  - a) True
  - b) False
- 8) A file being read or written sequentially should not have its pages replaced in LRU order, because \_\_\_\_\_
  - a) It is very costly
  - b) The most recently used page will be used last
  - c) It is not efficient
  - d) All of the mentioned
- 9) To avoid deadlock
  - a) There must be a fixed number of resources to allocate
  - b) Resource allocation must be done only once
  - c) All deadlocked processes must be aborted
  - d) Inversion technique can be used
- 10) In Unix the status of the process may be
  - a) Running
  - b) Orphan
  - c) Zombie
  - d) All of the mentioned
- 11) Each \_\_\_\_\_ has its own index block.
  - a) Partition
  - b) Address
  - c) File
  - d) All of mentioned
- 12) A deadlock avoidance algorithm dynamically examines the \_\_\_\_\_, to ensure that a circular wait condition can never exist.
  - a) Resource allocation state
  - b) System storage state
  - c) Operating system
  - d) Resources
- 13) The information about all files is kept in
  - a) Swap space
  - b) Operating system
  - c) Separate directory structure
  - d) None of the mentioned
- 14) In contiguous allocation \_\_\_\_\_
  - a) Each file must occupy a set of contiguous blocks on the disk
  - b) Each file is a linked list of disk blocks
  - c) All the pointers to scattered blocks are placed together in one location
  - d) None of the mentioned



2. Answer **any seven** of the following : **14**
- 1) What is the reusable resource ?
  - 2) List out different file attributes.
  - 3) What is deadlock ?
  - 4) What is Kernel ?
  - 5) List out advantages of Buffer Cache.
  - 6) Define - Dynamic linking and shared libraries.
  - 7) What is virtual memory ?
  - 8) Define request edge and allocation edge.
  - 9) What is the purpose of paging in the page tables ?
3. A) Attempt **any two** of the following : **10**
- 1) Write note on : Saving the context of process.
  - 2) Explain deadlock detection method for single instance of resources.
  - 3) Explain with diagram : Swapping technique for memory management.
- B) Differentiate between internal and external fragmentation. **4**
4. Answer **any two** of the following : **14**
- 1) Explain the banker's algorithm with example.
  - 2) Write in brief : Segmentation.
  - 3) Draw and explain process state transition diagram for UNIX operating system.
5. Answer **any two** of the following : **14**
- 1) What is page replacement ? Implement FIFO,LRU and Optimal Page replacement algorithms for following reference string and calculate page fault. (Take frames = 3)  
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.
  - 2) What is the cause thrashing ? How does the system detect thrashing ? Once it detects thrashing, what can the system do to eliminate this problem ?
  - 3) Explain different file accessing methods.
-





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**B.Sc. (E.C.S.) – II (Semester – IV) (CGPA) Examination, 2016**  
**Paper – II : OBJECT ORIENTED PROGRAMMING USING C++ – II (New)**

Time : 2½ hours

Max. Marks : 70

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right place indicate full marks.*

1. Choose correct alternatives :

14

- 1) Which allows you to create a derived class that inherits properties from more than one base class ?  
A) Multilevel inheritance                      B) Multiple inheritance  
C) Hybrid inheritance                          D) Hierarchical inheritance
- 2) The function whose prototype is void getData(Item \*thing); receives  
A) A pointer to a structure                      B) A reference to a structure  
C) A copy of a structure                         D) None of the mentioned
- 3) Which is used to create a pure virtual function ?  
A) \$    B) = 0    C) &    D) !
- 4) Which of the following can derived class inherit ?  
A) Members    B) Functions  
C) Both A) and B)                                      D) None of the mentioned
- 5) Pick out the correct statement about string template.  
A) It is used to replace a string  
B) It is used to replace a string with another string at runtime  
C) It is used to delete a string  
D) None of the mentioned
- 6) How to declare a template ?  
A) tem    B) temp  
C) template<>    D) none of the mentioned





2. Solve **any seven** : 14
- 1) What is a function template ?
  - 2) What is command line argument ?
  - 3) What is meant by abstract class ?
  - 4) What do you mean by file ?
  - 5) Define multipath inheritance.
  - 6) What is meant by exception ?
  - 7) Manipulators in CPP.
  - 8) What is the use of pointer object in CPP programming ?
  - 9) List out the various file modes.
3. A) Solve **any two** : 10
- 1) Explain in detail nesting of class with its appropriate example.
  - 2) Differentiate between sequential access and random access file.
  - 3) What do you mean by Custom exception ? Give an example.
- B) Write a program which shows the use of function template. 4
4. Solve **any two** : 14
- 1) Explain in detail various inheritance categories used in CPP programming language in detail.
  - 2) Write a program that read several city names from the keyboard and displays only those names beginning with characters “B” or “C”.
  - 3) Describe different file opening modes in detail. Write a program to open a file named “abc.bio” and write your name and other details into that file.
5. Solve **any two** : 14
- 1) Explain exception handling in detail its suitable example.
  - 2) What is *this* pointer ? Write a program demonstrating the use of *this* pointer.
  - 3) What is generic programming ? How it is implemented in CPP ?
-



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**B.Sc. (ECS) – II (Semester – IV) (CGPA) Examination, 2016  
DATA STRUCTURES AND ALGORITHMS ENGINEERING – II  
(Paper – III) (New)**

Time : 2½ Hours

Max. Marks : 70

**Instructions :** 1) **All questions are compulsory.**  
2) Figure to the **right** indicates **full marks.**

1. Choose the correct alternatives :

14

- 1) Leaf nodes are also called as
  - a) Internal nodes
  - b) Ancestor node
  - c) Terminal node
  - d) Root node
- 2) Any node in the path from the root to the node is called
  - a) Successor node
  - b) Ancestor node
  - c) Internal node
  - d) None of the above
- 3) The time complexity of quick sort is
  - a)  $O(n)$
  - b)  $O(n^2)$
  - c)  $O(n \log n)$
  - d)  $O(\log n)$
- 4) A graph is a tree if it has properties
  - a) It is connected
  - b) There are no cycles
  - c) Both a) and b)
  - d) None of these
- 5) In which type of BST traversal we get the sorted data ?
  - a) Preorder
  - b) Inorder
  - c) Postorder
  - d) DFS
- 6) In \_\_\_\_\_ method searching is faster.
  - a) Linear
  - b) Binary
  - c) Both a) and b)
  - d) None of these
- 7) Which data structure is used in DFS of a graph to hold nodes ?
  - a) Stack
  - b) Queue
  - c) Tree
  - d) Array



- 8) A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called a
- a) AVL tree  
b) Red-black tree  
c) Lemma tree  
d) None of the above
- 9) Which of the following sorting technique applied on two sorted lists ?
- a) Insertion sort  
b) Radix sort  
c) Quick sort  
d) Merge sort
- 10) Which of the following sorting algorithm is of divide and conquer type ?
- a) Bubble Sort  
b) Insertion Sort  
c) Quick Sort  
d) All of these
- 11) The degree of leaf node is
- a) 0                      b) 1                      c) -1                      d) 2
- 12) The complexity of Binary search algorithm is
- a)  $O(n)$   
b)  $O(\log_2 n)$   
c)  $O(n^2)$   
d)  $O(n \log n)$
- 13) The root is processed before its sub trees in \_\_\_\_\_ traversal.
- a) preorder              b) inorder              c) postorder              d) all of these
- 14) Number of nodes in a full binary tree of height h is calculated as
- a)  $2^h - 1$               b)  $2 + h - 1$               c)  $2^h - 1$               d)  $2^3 - h$

2. Solve **any seven** from the following :

14

- 1) Define degree of node. Give its example.
- 2) Define the term ancestor and descendent with example.
- 3) What is complete binary tree ? Give its example.
- 4) What are the applications of tree ?
- 5) What is graph ? What are the types of graph ?
- 6) What are the advantages of linear search over binary search ?
- 7) What is mid square hash function ? Give its example.
- 8) What is the difference between binary tree and binary search tree ?
- 9) What are the advantages of radix sort ?



3. A) Solve **any two** from the following : **10**
- 1) Explain B– Tree and B+ Tree with example.
  - 2) Write an algorithm for BFS of graph.
  - 3) Write a function for insert a node in BST.
- B) Explain AVL tree. **4**
4. Solve **any two** from the following : **14**
- 1) Write a program for tree traversal techniques.
  - 2) Explain adjacency matrix and adjacency list representation of graph with example.
  - 3) Write an algorithm for binary search.
5. Solve **any two** from the following : **14**
- 1) Explain delete operation in binary search tree with example.
  - 2) Explain the application of AOV network in detail.
  - 3) Write a program to implement Quick sort.
-



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**B.Sc. (ECS) – II (Semester – IV) (CGPA) Examination, 2016**  
**Paper – IV : SOFTWARE ENGINEERING – II (New)**

Time : 2 Hours 30 Minutes

Total Marks : 70

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternatives. 14
- 1) White box testing is also called as
    - a) Dataflow testing
    - b) Graph testing
    - c) Glass box testing
    - d) Basic path testing
  - 2) The \_\_\_\_\_ changeover method involves implementing the complete new system at a selected location of the company.
    - a) direct cutover
    - b) pilot operation
    - c) parallel operation
    - d) phased operation
  - 3) The process in which existing data is loaded into a new system is referred to as
    - a) data conversion
    - b) data addition
    - c) data direction
    - d) data exchange
  - 4) Which of the following symbol is not used in DFD ?
    - a) Process
    - b) Data store
    - c) Relationship
    - d) External entity
  - 5) Data dictionary is \_\_\_\_\_ tool.
    - a) Analysis
    - b) Designing
    - c) Testing
    - d) Investigation
  - 6) Employee is an example of external entity in a Payroll system.
    - a) True
    - b) False



- 7) The primary objective of system design is to
- a) design the programs, databases and test plan
  - b) design only user interfaces
  - c) implement the system
  - d) find out how the system will perform
- 8) CASE Tool stands for
- a) Computer Aided Software Engineering
  - b) Component Aided Software Engineering
  - c) Constructive Aided Software Engineering
  - d) Computer Analysis Software Engineering
- 9) Which of the following activity is carried out under implementation ?
- a) User training
  - b) System Conversions
  - c) Both a) and b)
  - d) None of these
- 10) \_\_\_\_\_ describes procedures.
- a) Structured chart
  - b) Structured English
  - c) Both a) and b)
  - d) None of these
- 11) The automated software tool used by systems analysts to develop information systems are called CASE tool.
- a) True
  - b) False
- 12) System test plan is specified
- a) when the final specifications are drawn up
  - b) during feasibility study
  - c) during the requirements specifications stage
  - d) during system study stage
- 13) DFD stands for Data Flow Diagram.
- a) True
  - b) False
- 14) \_\_\_\_\_ can allow excellent parallel implementation in the beginning.
- a) Top-down implementation
  - b) Bottom-up implementation
  - c) Sandwich implementation
  - d) Hierarchical implementation





2. Solve **any seven** of the following. **14**
- 1) List the external entities of College Admission System.
  - 2) Give the advantages of bottom-up incremental implementation.
  - 3) Differentiate between coupling and cohesion.
  - 4) Give the difference between Physical DFD and Logical DFD.
  - 5) Explain the concept of input design.
  - 6) What is meant by phase-in method ?
  - 7) What are the purposes of Data Flow Diagram ?
  - 8) State features of Turbo Analyst.
  - 9) What is data capture ?
3. A) Attempt **any two** of the following. **10**
- 1) Explain Structured English.
  - 2) What is cardinality ? Explain with suitable example.
  - 3) List and explain any one type of maintenance.
- B) Write a note on Structured Chart. **4**
4. Attempt **any two** of the following. **14**
- 1) What is Normalization ? Give the different advantages of normalization.
  - 2) What is DFD ? State the notations used for creating DFD with suitable example.
  - 3) What is CASE ? Explain any four CASE tools used in software development.
5. Attempt **any two** of the following. **14**
- 1) Discuss various types of testing during software development.
  - 2) List the entities and draw ERD for college admission system.
  - 3) Explain the concept and principle of output design.
-





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**B.Sc. (ECS) – II (Semester – IV) (New) (CGPA) Examination, 2016**  
**ELECTRONICS (Paper – V)**  
**Organization of PC – II**

Time : 2 ½ Hours

Total Marks : 70

**Instructions :** 1) **All** questions are **compulsory**.  
2) Figures to the **right** place indicate **full** marks.

1. Multiple choice questions :

**14**

- 1) Radio waves are \_\_\_\_\_ directional.
  - a) Bidirectional
  - b) Omni
  - c) Uni
  - d) Both a) and b)
  
- 2) The \_\_\_\_\_ copper wire reduces cross talk.
  - a) Twisted pair
  - b) Co-axial
  - c) Fiber optics
  - d) None of these
  
- 3) In \_\_\_\_\_ topology each computer is connected to all other computer.
  - a) Bus
  - b) Ring
  - c) Hybrid
  - d) Mesh
  
- 4) A \_\_\_\_\_ is a set of rules for communication between computers.
  - a) Operating system
  - b) OSI layer
  - c) Protocol
  - d) Signal
  
- 5) \_\_\_\_\_ is a multipoint repeater.
  - a) Switch
  - b) Hub
  - c) Router
  - d) bridge
  
- 6) ULSI contains between \_\_\_\_\_ no. of gates.
  - a) 10 and 100
  - b) 100 and 5000
  - c) 5000 and 50000
  - d) above 50000
  
- 7) Fanout of CMOS logic is \_\_\_\_\_
  - a) 3-10
  - b) 7-12
  - c) 12-19
  - d) 19-25

P.T.O.



- 8) Propagation delay time in CMOS logic is \_\_\_\_\_ ns.  
a) 2                      b) 5                      c) 10                      d) 15
- 9) In \_\_\_\_\_ Components mounting is only on one side of PCB.  
a) SMT                      b) PTH                      c) ETH                      d) None of these
- 10) In a \_\_\_\_\_ chip array of gates are provided without connecting circuit interconnection there by leaving the choice of connection to circuit user.  
a) Custom                      b) Semicustom  
c) Microcontroller                      d) None of these
- 11) The \_\_\_\_\_ microprocessor is first intel microprocessor offering multitasking and virtual memory.  
a) 80186                      b) 80286                      c) 80386                      d) 80486
- 12) In the \_\_\_\_\_ mode 80286 offers multiprogramming, virtual memory and memory protection.  
a) Real                      b) Protected  
c) Reserved                      d) None of these
- 13) 80486 has onchip cache memory of \_\_\_\_\_ kb.  
a) 8                      b) 16                      c) 32                      d) 64
- 14) Pentium pro is a \_\_\_\_\_ way superscalar architecture.  
a) 1                      b) 2                      c) 3                      d) 4

2. Answer **any seven** of the following :

**14**

- 1) Draw diagram of ring topology.
- 2) Give two differences of TTL and CMOS characteristics.
- 3) What is CISC ?
- 4) Define noise margin.
- 5) Give features of 80286 processor.
- 6) What is STP and UTP cable ?
- 7) What are advantages of SMD ?
- 8) Write seven layer of OSI reference model.
- 9) What is peer-to-peer network ?



3. A) Answer **any two** of the following : **10**
- 1) Explain multilayer PCB technology.
  - 2) Explain PLA.
  - 3) Explain briefly about computer network goals.
- B) Explain LAN, MAN and WAN. **4**
4. Attempt **any two** of the following : **14**
- 1) Explain SMD with any two device diagram.
  - 2) Explain unguided media.
  - 3) Explain Pentium MMX technology.
5. Attempt **any two** of the following : **14**
- 1) Explain the difference between FPGAs and CPLDs.
  - 2) Explain Fiber Distributed Data Interface (FDDI).
  - 3) Explain CISC and RISC concept.
-



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**B.Sc. (ECS) – II (Semester – IV) (New CGPA) Examination, 2016  
MICROPROCESSORS – II (Paper – VI)**

Time : 2½ Hours

Max. Marks : 70

- Instructions :** 1) *All questions are compulsory.*  
2) *Draw neat diagrams wherever necessary.*  
3) *Figures to the right place indicate full marks.*

1. Choose correct alternatives :

14

- 1) The \_\_\_\_\_ instruction adjust the binary result of ADD or ADC instruction.  
a) AAA                      b) ADC                      c) ADD                      d) ADI
- 2) The 8255 has \_\_\_\_\_ bit control word.  
a) 4                              b) 8                              c) 16                              d) 20
- 3) The I/O space of 8086 microprocessor is  
a) 1 M                              b) 16 K                              c) 20 K                              d) None of the above
- 4) Real memory of 80286 processor is  
a) 16 MB                              b) 20 MB                              c) 24 MB                              d) 10 MB
- 5) The 8086 microprocessor has \_\_\_\_\_ Byte instruction queue.  
a) 2                              b) 4                              c) 6                              d) 8
- 6) The internal data bus of 8088 microprocessor is  
a) 8 bit                              b) 16 bit                              c) 20 bit                              d) 32 bit
- 7) \_\_\_\_\_ is the unconditional transfer instruction.  
a) JC                              b) JNC                              c) JNZ                              d) JMP
- 8) In 8086 microprocessor \_\_\_\_\_ IC are used for clock generation.  
a) 8282                              b) 8286                              c) 8288                              d) 8284
- 9) The \_\_\_\_\_ Instruction copies a word from the stack location to destination specified instruction.  
a) MOV                              b) Copy                              c) PUSH                              d) POP

P.T.O.



- 10) The \_\_\_\_\_ Register serves as the primary Accumulator.  
a) AX                      b) BX                      c) CX                      d) DX
- 11) The 8253 has three independent \_\_\_\_\_ bit counter.  
a) 16                      b) 20                      c) 24                      d) 32
- 12) The real memory of 82386 are  
a) 4 GB                      b) 2 GB                      c) 1 GB                      d) 8 GB
- 13) \_\_\_\_\_ is the processor control instruction.  
a) MOV                      b) POP  
c) CLD                      d) ROL
- 14) The BIU always inserts \_\_\_\_\_ for the lowest four bits to form a 20 bit address for a segment.  
a) one                      b) zero  
c) nibble                      d) none of these

2. Answer **any seven** of the followings :

**14**

- 1) State different data transfer instructions.
- 2) Explain modes of 8255.
- 3) Give addressing modes of advanced microprocessors.
- 4) Give difference between linear and absolute decoding.
- 5) Explain pipelining concept of 8086.
- 6) Explain channels of 8257.
- 7) Explain basic concept of interfacing.
- 8) Explain segment registers of 8086.
- 9) Give difference between 8086 and 8088 microprocessor.

3. A) Attempt **any two** of the following :

**10**

- 1) Write assembly language program for addition and subtraction of two 8 bit numbers.
- 2) Explain with suitable diagram linear select decoding.
- 3) Explain flag registers in advanced microprocessors.

B) Explain different features of advanced microprocessors.

**4**



4. Answer **any two** of the followings : **14**

- 1) Explain with suitable diagram maximum mode operation of 8086 microprocessor.
- 2) Draw block diagram of 8253. Explain different modes of 8253.
- 3) Explain different types of Bit manipulation instructions.

5. Answer **any two** of the followings : **14**

- 1) Draw internal architecture of 8086 microprocessor. Explain general purpose registers.
  - 2) Give different types of instruction set. Explain program execution transfer instruction and string type instructions.
  - 3) Explain different types of bus contention.
-





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**B.Sc. (ECS) Part – III (Semester – V) (New CGPA)  
Examination, 2016  
DATA COMMUNICATION AND NETWORKING – I (Paper – I)**

Time : 2 ½ Hours

Max. Marks : 70

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternative : **14**
- 1) Which of the following is used for modulation and demodulation ?  
a) Modem                      b) Protocols              c) Gateways              d) Multiplexer
  - 2) Which of the following summation operations is performed on the bits to check an error-detecting code ?  
a) Codec    b) Coder\_decoder  
c) Checksum    d) Attenuation
  - 3) The communication mode that supports two way traffic but only one direction at a time is  
a) Simplex                      b) Duplex                      c) Half duplex              d) Multiplex
  - 4) The layer protocols which are responsible for user and the application program such as passwords, file transfer, resource sharing are  
a) Layer 7 protocols    b) Layer 6 protocols  
c) Layer 5 protocols    d) Layer 4 protocols
  - 5) Compared to analog signals, digital signals  
a) Allow faster transmission    b) Are more accurate  
c) Both a) and b)    d) None of these
  - 6) An error detecting code is which code is the remainder resulting from dividing the bits to be checked by a predefined binary number is known as  
a) Cyclic redundancy code    b) Checksum  
c) Error detecting code    d) Parity check code

P.T.O.



- 7) CSMA is
- a) A method of determining which device has access to the transmission medium at any time
  - b) A method access control technique for multiple access transmission media
  - c) A very common bit oriented data link protocol issued by ISO
  - d) None of the above
- 8) End to end connectivity is provided from host-to-host in
- a) Network layer
  - b) Session layer
  - c) Data link layer
  - d) Transport layer
- 9) In virtual circuit network each packet contains
- a) Full source and destination address
  - b) A short VC number
  - c) Both a) and b)
  - d) None of the above
- 10) Which transmission media has the highest transmission speed in a network ?
- a) Coaxial cable
  - b) Twisted pair cable
  - c) Optical fiber
  - d) Electrical cable
- 11) In which subnet packets are routed independently ?
- a) Datagram subnet
  - b) Virtual circuit subnet
  - c) Both a) and b)
  - d) None of the above
- 12) Synchronous transmission falls under
- a) Parallel transmission
  - b) Serial transmission
  - c) Asynchronous transmission
  - d) None of the above
- 13) The topology in which every device has a dedicated point link with every other device is
- a) Mesh
  - b) Star
  - c) Bus
  - d) Ring
- 14) The service primitive that work waiting for an incoming connection is
- a) CONNECT
  - b) RECEIVE
  - c) SEND
  - d) LISTEN



2. Answer **any seven** of the following : **14**
- 1) What is framing ?
  - 2) Explain types of errors.
  - 3) What is routing ?
  - 4) Give any two advantages and disadvantages of bus topology.
  - 5) What is multiplexing ? Mention its types.
  - 6) State advantages of circuit switching.
  - 7) What is transmission impairment ? Mention its causes.
  - 8) Define the terms frequency and bandwidth.
  - 9) State applications of internet.
3. A) Attempt **any two** of the following : **10**
- 1) What are the design issues for layers ?
  - 2) Explain the optimality principle.
  - 3) Explain any two layers of OSI model with labeled diagram.
- B) State the comparison between virtual circuit subnet and datagram subnet. **4**
4. Attempt **any two** of the following : **14**
- 1) Draw the neat labelled diagram and explain TCP/IP reference model.
  - 2) Write a short note on synchronous and asynchronous transmission.
  - 3) Explain shortest path routing with example.
5. Attempt **any two** of the following : **14**
- 1) Explain stop and wait ARQ protocol.
  - 2) Explain cyclic redundancy code with example.
  - 3) What is internet ? Explain its architecture.
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**B.Sc. (ECS) – III (Semester – V) (New – CGPA) Examination, 2016**  
**COMPUTER SCIENCE**  
**Database Management System – I (Paper – II)**

Time : 2½ Hours

Max. Marks : 70

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose correct alternatives : 14

- 1) DBMS is a collection of \_\_\_\_\_ that enables user to create and maintain a database.  
A) Keys  
B) Translators  
C) Program  
D) Language Activity
- 2) In a relational schema, each tuple is divided into fields called  
A) Relations  
B) Domains  
C) Queries  
D) All of the above
- 3) In an ER model, \_\_\_\_\_ is described in the database by storing its data.  
A) Entity  
B) Attribute  
C) Relationship  
D) Notation
- 4) DFD stands for  
A) Data Flow Document  
B) Data File Diagram  
C) Data Flow Diagram  
D) None of the above
- 5) \_\_\_\_\_ table store information about database or about the system.  
A) SQL  
B) Nested  
C) System  
D) None of these
- 6) \_\_\_\_\_ clause is an additional filter that is applied to the result.  
A) Select  
B) Group-by  
C) Having  
D) Order by
- 7) \_\_\_\_\_ is a full form of SQL.  
A) Standard Query Language  
B) Sequential Query Language  
C) Structured Query Language  
D) Server side Query Language



- 8) A relational database developer refers to a record as  
A) a criteria B) a relation  
C) a tuple D) an attribute
- 9) \_\_\_\_\_ keyword is used to find the number of values in a column.  
A) Total B) Count C) Add D) Sum
- 10) An advantage of the database management approach is  
A) Data is dependent on programs  
B) Data redundancy increases  
C) Data is integrated and can be accessed by multiple programs  
D) None of the above
- 11) Key to represent relationship between tables is called  
A) Primary key B) Secondary key  
C) Foreign key D) None of the above
- 12) Grant and revoke are \_\_\_\_\_ statements.  
A) DDL B) TCL C) DCL D) DML
- 13) \_\_\_\_\_ command can be used to modify a column in a table.  
A) Alter B) Update C) Set D) Create
- 14) Architecture of the database can be viewed as  
A) Two level B) Five level  
C) Three level D) One level

2. Solve **any seven** of the following :

14

- 1) Define Tuple.
- 2) State database components.
- 3) State any four clauses used in SQL.
- 4) Define Degree.
- 5) Define aggregation.
- 6) Define normalization.
- 7) State any four operators in SQL.
- 8) What is the meaning of Indexing ?
- 9) Define Hashing.



3. A) Solve **any two** of the following : **10**
- 1) Explain the difference between 1NF and 2NF.
  - 2) What are the advantages of DBMS ?
  - 3) Explain operation on file.
- B) Explain outer join with example. **4**
4. Solve **any two** of the following : **14**
- 1) Explain Codd's rules in detail.
  - 2) What are the methods of indexing ?
  - 3) Describe types of Database architecture.
5. Solve **any two** of the following : **14**
- 1) Explain E-R diagram with example.
  - 2) Explain group by and having by clause in SQL with example.
  - 3) Explain types of keys with example.
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**B.Sc. (ECS) (Part – III) (Semester – V) Examination, 2016**  
**COMPUTER SCIENCE (New-CGPA) (Paper – III)**  
**Core Java**

Time : 2 Hours 30 Minutes

Total Marks : 70

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternatives :

14

1) What is stored in the object obj in following lines of code ?

box obj;

- a) Memory address of allocated memory of object
- b) NULL
- c) Any arbitrary pointer
- d) Garbage

2) How many classes we are able to extend in java ?

- a) one
- b) two
- c) three
- d) any number of

3) \_\_\_\_\_ prevents a method in a super class from being overridden by its subclass.

- a) super
- b) abstract
- c) static
- d) final

4) Which of these access specifier can be used for a class so that it's members can be accessed by a different class in the different package ?

- a) Public
- b) Protected
- c) Private
- d) No Modifier

5) Suspend thread can be revived by using \_\_\_\_\_ method.

- a) start()
- b) suspend()
- c) resume()
- d) yield()

6) Which of these classes is used for input and output operation when working with bytes ?

- a) InputStream and OutputStream
- b) Reader and Writer
- c) Both a and b
- d) None of these



- 7) Which of these packages contains collection classes in Java ?  
a) java.applet            b) java.util            c) java.event            d) java.awt.event
- 8) The maximum priority of a thread is  
a) 5                            b) 10                            c) 15                            d) 20
- 9) The \_\_\_\_\_ package contains stream classes.  
a) java.io                    b) java.util            c) java.awt            d) java.lang
- 10) Primitive data types can be converted into object types by using \_\_\_\_\_ classes.  
a) Vector                    b) StringBuffer    c) Wrapper            d) String
- 11) \_\_\_\_\_ layout arranges components into rows and columns.  
a) Border                    b) Flow                    c) Grid                    d) None of the above
- 12) Which of the following type of listener is used for handling button click events ?  
a) MouseListener    b) ItemListener    c) KeyListener    d) ActionListener
- 13) Method overloading in java enables to define a method with  
a) Different number of arguments  
b) Different types of arguments  
c) Either different number or different types of arguments  
d) Different number and types of arguments
- 14) An Exception in a java is a condition that is caused by  
a) Compile time error                    b) Run time error  
c) Both a and b                    d) Any type of error

2. Answer **any seven** from the following :

**14**

- 1) Why java is called garbage collected language ?
- 2) What are the use of static keyword ?
- 3) List the different uses of final keyword.
- 4) Define interface. Write its syntax.
- 5) Explain the use of Runnable interface.





- 6) Explain any two wrapper classes.
  - 7) What is synchronization ?
  - 8) What is Unicode in java ?
  - 9) List the different adapters used for event handling.
3. A) Answer **any two** from the following : **10**
- 1) Explain Java environment and tools.
  - 2) Explain the use of this keyword with example.
  - 3) Explain the try catch finally flow.
- B) Write a note on method overloading. **4**
4. Answer **any two** from the following : **14**
- 1) Explain thread life cycle.
  - 2) Write a program to implement ActionListener interface.
  - 3) Write a program to demonstrate multiple inheritance by the use of interfaces.
5. Answer **any two** from the following : **14**
- 1) Explain the use of super keyword with example.
  - 2) What is constructor ? Explain the types of constructor with example.
  - 3) Write a program to demonstrate user defined exception.
-



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**B.Sc. (E.C.S.) – III (Semester – V) (New CGPA Pattern)**  
**Examination, 2016**  
**COMPUTER SCIENCE**  
**Theory of Computer Science (Paper – IV)**

Time : 2½ Hours

Max. Marks : 70

**Instructions:** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternative :

14

- 1) The basic limitation of Finite State Machine is that
  - a) It cannot remember arbitrary large information
  - b) It sometimes recognizes non regular language
  - c) It sometimes does not recognize regular language
  - d) All of them
- 2) Moore machine is \_\_\_\_\_
  - a) Automaton in which the output depends only on the states
  - b) Automaton in which the output depends only on the input
  - c) Automaton in which the output depends only on the states and input
  - d) None of the above
- 3) Which one is false ?
  - a)  $(r^*)^* = r^*$
  - b)  $r_1^* (r_1 + r_2)^* = (r_1 + r_2)^*$
  - c)  $(r_1 + r_2)^* = (r_1^* r_2^*)^*$
  - d) None of the above
- 4) For  $L(r) = \{a, bb, aa, abb, ba, bbb, \dots\}$ ,  $r$  is given by
  - a)  $r = a(a + bb)^*$
  - b)  $r = (a + bb)^*$
  - c)  $r = (aa + b)(a + b)^*$
  - d)  $r = (a + b)^*(a + bb)$
- 5) Which of the following identity does not hold ?
  - a)  $\lambda R = R\lambda = R$
  - b)  $\lambda + R = R + \lambda$
  - c)  $\Phi R = R\Phi = \Phi$
  - d)  $\Phi + R = R + \Phi = R$



6) Which of the following set is regular ?

$$a) \{a^{i^2} \mid i \geq 1\}$$

$$b) \{a^p \mid p \text{ is prime}\}$$

$$c) \{ww \mid w \in \{a, b\}^*\}$$

$$d) \{a^{2^n} \mid n \geq 1\}$$

7) Which of the following is true for the language generated by  
 $S \rightarrow AB, A \rightarrow BB \mid a, B \rightarrow AB \mid b$  ?

a) aabbb does not belong to this language

b) aabb belongs to this language

c) ab does not belong to this language

d) aab belongs to this language

8) A language L is accepted by a FA if and only if

a) Right linear

b) Primitive recursive

c) Context sensitive

d) Recursive

9) The language generated by the grammar  $S \rightarrow 0S1 \mid 0A1, A \rightarrow 1A \mid 1$  is

$$a) \{0^m 1^n \mid m > n > 1\}$$

$$b) \{0^m 1^n \mid m \geq n > 1\}$$

$$c) \{0^m 1^n \mid n > m \geq 1\}$$

$$d) \{0^m 1^n \mid n \geq m > 1\}$$

10) A TM is more powerful than FSM because

a) Tape movement is confined to one direction

b) It has finite state control

c) It has a capability to remember arbitrary long input symbols

d) None of these

11) The set of regular language over a given alphabet set is not closed under

a) Union

b) Complement

c) Intersection

d) None of these

12) Which of the following is not regular ?

a) Strings of zero whose length is perfect square

b) Set of palindromes over 0 and 1

c) Strings of zero whose length is prime

d) All of these

13) The language  $\{ww^r\}$  is

a) Accepted by a DPDA not by NPDA

b) Accepted by a NPDA not by DPDA

c) Cannot say

d) None of these



- 14) The definition of Turing Machine is robust because
- a) Functional testing of TM finds no errors
  - b) TM will not crash for any input string
  - c) Certain changes (such as many tapes) results in machines of equivalent power
  - d) TM has nothing to do with robustness

2. Answer the following (**any seven**) : **14**

- 1) Construct PDA for  $L = \{a^n b^{n+1} \mid n \geq 1\}$ .
- 2) Construct an NFA that accepts the set of strings defined over set  $\{0, 1\}$  that starts with 1 and are congruent to 0 module 3.
- 3) Construct TM that recognizes the language  $L = \{x \in \{0, 1\}^* \mid x \text{ ends in } 00\}$ .
- 4) Consider the grammar whose productions are as :  
 $S \rightarrow aSb \mid aA \mid bB$   
 $A \rightarrow aA \mid a \mid \lambda$   
 $B \rightarrow bB \mid b \mid \lambda$   
Find  $L(G)$ .
- 5) What are Left Recursive and Right Recursive Grammar ?
- 6) How many ways a language  $L$  can be accepted by PDA ?
- 7) Consider the right linear grammar  $G = \langle \{S, X\}, \{0, 1\}, S, P \rangle$  where the productions are :  
 $S \rightarrow 0X \mid 1S$   
 $X \rightarrow 1X \mid 1$   
Find the language generated by this grammar.
- 8) Construct a DFA to accept the following language :  
 $L = \{x \in \{a, b\}^* \mid |x| \text{ is a multiple of } 2 \text{ or } 3\}$ .
- 9) Give the formal definition of Turing Machine.

3. A) Answer the following (**any two**) : **10**

- a) Convert the following grammar into CNF :  
 $S \rightarrow ASB \mid \lambda$   
 $A \rightarrow aAS \mid a$   
 $B \rightarrow SbS \mid A \mid bb$ .



b) Construct Finite Automata for  $(01 + 10)^* + 0(01^*)^*$ .

c) Consider the grammar :

$S \rightarrow iCtSeS \mid iCtS \mid a$

$C \rightarrow b$

i) Show that the given grammar is ambiguous.

ii) Remove the ambiguity.

B) Give CFG for  $L = \{a^i b^j c^k \mid i + j = k; i, j \geq 1\}$ .

4

4. Answer the following (**any two**) :

14

a) Give the application of Pumping Lemma. Using Pumping Lemma for regular sets prove that following language is not regular :

$L = \{0^m 1^n 0^{m+n} \mid m \geq 1 \text{ and } n \geq 1\}$ .

b) Convert the following grammar into GNF :

$S \rightarrow AaB \mid a$

$A \rightarrow SBb \mid bA$

$B \rightarrow Ba \mid b$ .

c) Let  $L = \{0^a 1^b 2^c \mid a, b, c \geq 1; a = b + 1\}$ .

Construct :

i) PDA accepting L by empty store.

ii) PDA accepting L by final state.

Also show the processing of string "0001122" by the final state.

5. Answer the following (**any two**) :

14

a) Design a PDA to recognize the language generated by the following grammar  $S \rightarrow S + S \mid S^* S \mid 2 \mid 4$ . Show the acceptance of the input string "4 + 4\* 2" by this PDA.

b) Design a TM which accepts all strings of the form  $a^n b^n$  for  $n \geq 1$  and rejects all other strings. Also show the processing sequence for the input string "aaabbb".

c) Consider the following NFA with  $\epsilon$ -move :

$\delta$	$\epsilon$	a	B	c
p	{q, r}	$\Phi$	{q}	{r}
q	$\Phi$	{p}	{r}	{p, q}
$r^*$	$\Phi$	$\Phi$	$\Phi$	$\Phi$

i) Compute the  $\epsilon$ -closure of each state.

ii) Convert the automata of DFA.



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**B.Sc. – III (Semester – V) (ECS) (New – CGPA) Examination, 2016  
WEB TECHNOLOGY AND E-COMMERCE – I (Paper – V)**

Time : 2½ Hours

Max. Marks : 70

**N.B. :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternatives :

14

- 1) The \_\_\_\_\_ control provides to display different image on page each time it is loaded.
  - a) Repeater
  - b) Image
  - c) ImageMap
  - d) Adrotator
- 2) Master page contains at least \_\_\_\_\_ number of content placeholder controls.
  - a) 1
  - b) 2
  - c) 3
  - d) Many
- 3) The default event for textbox control is \_\_\_\_\_.
  - a) TextChanged
  - b) CheckedChanged
  - c) Click
  - d) Command
- 4) We may add more than one form tag in web page.
  - a) True
  - b) False
- 5) \_\_\_\_\_ is the last stage of the web forms life cycle.
  - a) Page load
  - b) Validate
  - c) Page unload
  - d) Page init
- 6) Asp.Net validation controls works at \_\_\_\_\_.
  - a) Client side
  - b) Server side
  - c) Both client and server side
  - d) None of these
- 7) \_\_\_\_\_ is the mandatory property for all validation controls.
  - a) Control to validate
  - b) Message
  - c) Enable client script
  - d) Enable server script



- 8) \_\_\_\_\_ is the form in which postback occur.
  - a) Html
  - b) Web form
  - c) Win form
  - d) None of these
  
- 9) Common type system is built into \_\_\_\_\_
  - a) CLR
  - b) RCT
  - c) CTS
  - d) CLS
  
- 10) \_\_\_\_\_ is the control which does not have any visible interface.
  - a) Data list
  - b) Drop down list
  - c) Repeater
  - d) Data grid
  
- 11) \_\_\_\_\_ is the first stage of EDI trade cycle.
  - a) Execution
  - b) Pre-Sale
  - c) After sale
  - d) Both a) and b)
  
- 12) \_\_\_\_\_ is not the example of B to C in e-commerce.
  - a) E-commerce
  - b) Amazon.com
  - c) ebay.com
  - d) dell.com
  
- 13) \_\_\_\_\_ is used to transfer computer to computer transaction information contained in standard business document.
  - a) Internet commerce
  - b) EDI
  - c) e-market
  - d) None of these
  
- 14) \_\_\_\_\_ is application folder.
  - a) Bin
  - b) App\_theme
  - c) None
  - d) Both a) and b)

2. Answer the following (**any seven**) :

14

- 1) Define E-Market.
- 2) Explain Regular Expression Validator.
- 3) Write short note on CLR.
- 4) Define IIS.
- 5) Explain @ Master directive.
- 6) What are the Asp.net Page structure options ?
- 7) List the location option used for asp.net application.
- 8) List Box control.
- 9) Advantages of E-Commerce.



3. A) Answer the following (**any two**) : **10**
- 1) Explain AdRotator control with example.
  - 2) What is meant by cross page posting explain with example ?
  - 3) Define E-Commerce. Explain scope of E-Commerce.
- B) Explain Namespace and Assembly. **4**
4. Answer the following (**any two**) : **14**
- 1) What are validation controls ? List its types and explain them briefly.
  - 2) Explain Porters module for computative advantage.
  - 3) Explain .Net framework in detail.
5. Answer the following (**any two**) : **14**
- 1) Write a short note on Master page with example. Explain different events occur when a master page is merged with a content page.
  - 2) What is page Directives and explain different page directives ?
  - 3) Explain different types of E-Commerce.
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**B.Sc. (E.C.S.) – III (Semester – V) (New CGPA) Examination, 2016**  
**Paper – VI : VISUAL PROGRAMMING AND APPLICATION**  
**SOFTWARE – I**

Time : 2 Hours 30 Minutes

Max. Marks : 70

1. Choose the correct alternative. 14

- 1) In C#, a subroutine is called a  
a) Function                      b) Metadata                      c) Method                      d) Managed code
- 2) All C# applications begin execution by calling the \_\_\_\_\_ method.  
a) Class()                      b) Main()                      c) Submain()                      d) Namespace
- 3) A \_\_\_\_\_ is an identifier that denotes a storage location  
a) Constant    b) Reference type  
c) Variable    d) Object
- 4) In C#, all binary operators are \_\_\_\_\_  
a) Center-associative    b) Right-associative  
c) Left-associative    d) Top-associative
- 5) C# has \_\_\_\_\_ operator, useful for making two way decisions.  
a) Looping                      b) Functional                      c) Exponential                      d) Conditional
- 6) \_\_\_\_\_ variables are visible only in the block they are declared.  
a) System                      b) Global                      c) Local                      d) Console
- 7) A structure in C# provides a unique way of packing together data of \_\_\_\_\_ types  
a) Different                      b) Same                      c) Invoking                      d) Calling
- 8) A \_\_\_\_\_ creates an object by copying variables from another object.  
a) Copy constructor    b) Default constructor  
c) Invoking constructor    d) Calling constructor

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- 9) The C# provides special methods known as \_\_\_\_\_ methods to provide access to data members.  
a) Loop                      b) Functions              c) Methods                  d) Accessor
- 10) Inheritance is \_\_\_\_\_ in nature.  
a) Commutative      b) Associative      c) Transitive              d) Iterative
- 11) \_\_\_\_\_ are reserved, and cannot be used as identifiers.  
a) Keywords              b) Literal                  c) Variables                  d) Identifiers
- 12) Every class directly or indirectly extends the \_\_\_\_\_ class.  
a) System                  b) Object                  c) Drawing                  d) Console
- 13) When a thread returns from a Wait Sleep Join or Suspended state it returns to the  
a) Unstarted state      b) Stopped state      c) Started state      d) Resume state
- 14) By default priority of thread is  
a) normal                  b) highest                  c) above normal      d) below normal

2. Attempt the following (**any seven**).

14

- 1) What is Namespace ? List out the Namespaces of .NET Framework.
- 2) How to define constants in C# ?
- 3) What is structure ? How it is created in C# ?
- 4) What is the use of Enumeration ?
- 5) Differentiate between single file and multi file assemblies.
- 6) What is operator overloading ?
- 7) What is the difference between ref and out parameters ?
- 8) What is type casting and how it is done in C# ?
- 9) What are nullable types in C# ?



3. A) Answer the following (**any 2**). **10**
- 1) Write a C# program to accept an integer as command line parameter from the user and check whether it is prime number or not.
  - 2) What is inheritance ? How is it implemented in C# ?
  - 3) Explain different visibility modifiers used in C# programming.
- B) Define an interface. Explain how it is created in C# with suitable examples. **4**
4. Answer the following (**any 2**). **14**
- 1) What is the use of Binary Reader and Binary Writer ? Explain with suitable example program.
  - 2) What is the use of Collection in C# ? With a sample code, explain the system, Array class and its utilities.
  - 3) Write a program to read and write the text to the file.
5. Answer the following (**any 2**). **14**
- 1) Write a C# program for creating and starting a thread.
  - 2) What is indexer in C# ? Explain with example. Also compare properties and indexers.
  - 3) What are Generic types in C# ? Explain with example.
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**B.Sc. (ECS) – III (Semester – V) (Old) Examination, 2016  
DATA COMMUNICATIONS AND NETWORKING – I (Paper – I)**

Time : 2 Hours

Max. Marks : 50

***N.B. : 1) All questions are compulsory.  
2) Figures to the right indicate full marks.***

1. Choose correct alternatives : 10
- 1) Communication between a computer and a keyboard involves \_\_\_\_\_ transmission.
    - a) Simplex
    - b) Half-duplex
    - c) Full-duplex
    - d) None of the above
  - 2) The Internet working Protocol (IP) is a \_\_\_\_\_ protocol.
    - a) Connection-oriented
    - b) Reliable
    - c) Both a and b
    - d) None of the above
  - 3) The structure or format of data is called
    - a) Syntax
    - b) Semantics
    - c) Struct
    - d) None of the above
  - 4) Repeater operates \_\_\_\_\_ layer of OSI Reference model.
    - a) Physical
    - b) Data link
    - c) Network
    - d) Transport
  - 5) \_\_\_\_\_ cable consists of an inner copper core and a second conducting outer sheath.
    - a) Twisted-pair
    - b) Shielded twisted-pair
    - c) Coaxial
    - d) Fiber-optic
  - 6) \_\_\_\_\_ is a collection of many separate networks.
    - a) a WAN
    - b) an Internet
    - c) a LAN
    - d) None of the above



- 7) A \_\_\_\_\_ routing table contains information entered manually.
- a) Static
  - b) Dynamic
  - c) Hierarchical
  - d) None of the above
- 8) This topology requires multi point connection
- a) Star
  - b) Mesh
  - c) Ring
  - d) Bus
- 9) A simple parity-check code can detect \_\_\_\_\_ errors.
- a) An odd-number of
  - b) An even-number of
  - c) Two
  - d) No errors
- 10) The network layer concerns with
- a) Bits
  - b) Frames
  - c) Packets
  - d) None of the above

2. Answer **any five** of the following :

**10**

- 1) What is meant by half duplex data flow ?
- 2) State applications of Internet.
- 3) What is framing ?
- 4) Define Phase Modulation.
- 5) Define noise. Mention the types of noise.
- 6) Define phase and Amplitude.

3. A) Answer **any two** of the following :

**6**

- 1) Explain Mesh topology.
- 2) Explain the components of data communications system.
- 3) Explain various design issues of Data link layer.

B) Explain TCP/IP reference model in detail.

**4**

4. Answer **any two** of the following :

**10**

- 1) Explain CSMA/CD.



2) Explain Circuit switching in detail.

3) Explain Link State Routing.

5. Answer **any two** of the following :

10

1) Explain congestion prevention policies in detail.

2) Explain Go-Back-n protocol.

3) Explain Fiber Optic Cable in detail.

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**B.Sc. (ECS) – III (Semester – V) (Old) Examination, 2016**  
**DATABASE MANAGEMENT SYSTEM – I (Paper – II)**

Time : 2 Hours

Total Marks : 50

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternatives : 10
- 1) Which of the following statement regarding to primary key is false ?
    - a) A primary key can have null values
    - b) A primary key may contain duplicate values
    - c) Primary key cannot be applied for multiple columns
    - d) All of the above
  - 2) The statement in SQL which allows changing the definition of table is \_\_\_\_\_
    - a) Alter b) Update
    - c) Create d) Select
  - 3) The where clause is used to specify \_\_\_\_\_
    - a) A condition to filter the records of the table
    - b) The location of the record in the table
    - c) The location of the table in the database
    - d) None of the above
  - 4) Logical operator's are \_\_\_\_\_
    - a) AND, OR, NOT
    - b) PLUS, MINUS, MULTIPLY
    - c) UNION, INTERSECTION, DEVIDE
    - d) None of the above





- 5) In relational model cardinality is \_\_\_\_\_
- a) Number of tuples
  - b) Number of attribute
  - c) Number of tables
  - d) Number of constraints
- 6) Schema describes \_\_\_\_\_
- a) Data elements
  - b) Records and Files
  - c) Record relationship
  - d) All of the above
- 7) Generalization is \_\_\_\_\_ Process.
- a) Top down
  - b) Bottom up
  - c) Both a) and b)
  - d) None of the above
- 8) E-R Model uses \_\_\_\_\_ symbol to represent weak entity set.
- a) Dotted rectangle
  - b) Diamond
  - c) Doubly outlined rectangle
  - d) None of the above
- 9) Each row in table is known as \_\_\_\_\_
- a) Record
  - b) Tuple
  - c) Both a) and b)
  - d) None of the above
- 10) The database environment has all of the following components except \_\_\_\_\_
- a) Users
  - b) Separate files
  - c) Data base
  - d) DBA

2. Attempt **any five** :

**10**

- 1) Define DBMS. List out its applications.
- 2) List out database languages.
- 3) Define Aggregation.
- 4) What is domain, tuples and relations ?
- 5) Write Syntax of SEQUENCE.
- 6) List out operations on file.



3. A) Attempt **any two** : **6**
- 1) Explain hashing with example.
  - 2) Describe order by clause with example.
  - 3) Define attribute. Explain its type.
- B) Explain operation on Relational Algebra. **4**
4. Attempt **any two** : **10**
- 1) Explain difference between DELETE, DROP and TRUNCATE command.
  - 2) What is view ? Explain with example.
  - 3) What is Normalization ? Explain BCNF.
5. Attempt **any two** : **10**
- 1) Explain 2-tier and 3-tier client server architecture.
  - 2) What is RDBMS ? List out its rule.
  - 3) Draw diagram for DBMS architecture.
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Seat No.	
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**B.Sc. (ECS) (Part – III) (Semester – V) (Old) Examination, 2016**  
**COMPUTER SCIENCE**  
**Paper – III : Core Java**

Time : 2 Hours

Total Marks : 50

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternatives : 10
- 1) The maximum priority of a thread is  
a) 5                                      b) 10                                      c) 15                                      d) 20
  - 2) The \_\_\_\_\_ package contains stream classes.  
a) java.io                                      b) java.util                                      c) java.awt                                      d) java.lang
  - 3) Primitive data types can be converted into object types by using \_\_\_\_\_ classes.  
a) Vector                                      b) StringBuffer  
c) Wrapper                                      d) String
  - 4) \_\_\_\_\_ layout arranges components into rows and columns.  
a) Border                                      b) Flow                                      c) Grid                                      d) None of the above
  - 5) \_\_\_\_\_ is a name given to a variable, class or method.  
a) Constant                                      b) Reference                                      c) Identifier                                      d) Modifier
  - 6) Wait thread can be revived by using \_\_\_\_\_ method.  
a) start()                                      b) suspend()                                      c) notify()                                      d) yield()
  - 7) Which of the following type of listener is used for handling button click events ?  
a) MouseListener                                      b) ItemListener  
c) Keylistener                                      d) ActionListener
  - 8) Which of the class is necessary to implement datagrams ?  
a) DatagramPacket                                      b) DatagramSocket  
c) Both a and b                                      d) None of these



- 9) An exception in a java is a condition that is caused by
- a) Compile time error
  - b) Run time error
  - c) Both a and b
  - d) Any type of error
- 10) Method overloading in java enables to define a method with
- a) Different number of arguments
  - b) Different types of arguments
  - c) Either different number or different types of arguments
  - d) Different number and types of arguments
2. Solve **any five** : **10**
- 1) Explain java as a platform independent.
  - 2) Explain the use of this keyword.
  - 3) Explain the use of final keyword.
  - 4) What is exception ? What is user defined exception ?
  - 5) What is synchronization ?
  - 6) Explain any two wrapper classes.
3. A) Solve **any two** : **6**
- 1) Explain the difference between java and C++.
  - 2) Explain static and non-static data members and methods.
  - 3) What are the different types of I/O stream classes ?
- B) Explain method overloading with example. **4**
4. Solve **any two** : **10**
- 1) Write a program to demonstrate the use of throw and throws clause.
  - 2) Explain the use of runnable interface with example.
  - 3) Explain the different parameter passing techniques.
5. Solve **any two** : **10**
- 1) Explain InetAddress class with example.
  - 2) Explain the uses of super keyword with example.
  - 3) Explain different listeners and adapters used for event handling.
-



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**B.Sc. (ECS) – III (Semester – V) (Old) Examination, 2016  
THEORY OF COMPUTER SCIENCE (Paper – IV)**

Time : 2 Hours

Max. Marks : 50

**Note :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternative : **10**
- 1) Proper suffixes of the string abc are
 

a) { $\epsilon$ , c, bc, abc}	b) { $\epsilon$ , c, bc}
c) { $\epsilon$ , a, ab, abc}	d) { $\epsilon$ , a, ab}
  - 2) Type 1 grammar is also called as \_\_\_\_\_ grammar.
 

a) Context free	b) Context sensitive
c) Recursive	d) Regular
  - 3) The Moore machine has final states.
 

a) True	b) False
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  - 4) Pumping lemma is a
    - a) Powerful tool for providing certain languages non-regular
    - b) Powerful tool for providing certain languages context sensitive
    - c) Both a and b
    - d) None of these
  - 5) Every NFA with  $\epsilon$ -moves has an equivalent
 

a) NFA without $\epsilon$ -moves	b) DFA
c) Both a and b	d) None of these
  - 6) If  $L(r) = \{a, aa, aaa, aaaa, aaaaa\}$  then  $r =$ 

a) $a^*$	b) $a^+$	c) $a^5$	d) $a^4$
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**P.T.O.**



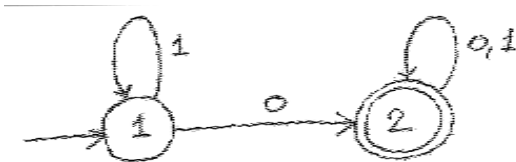
- 7) The transition function  $\delta: Q \times (\Sigma \cup \{\epsilon\}) \times \Gamma \rightarrow Q \times \Gamma^*$  is of  
 a) PDA                      b) FSM                      c) Turing machine      d) Mealy Machine
- 8) NPDA is more powerful than PDA.  
 a) True                                      b) False
- 9) Regular expression  $(a+b).(a+b)$  denotes the set  
 a) a    b) {aa, ba, ab, bb}  
 c) {abab}                                      d) {aabb}
- 10) In CNF grammar is required in the form of  
 a)  $A \rightarrow BC|a$       b)  $A \rightarrow a\alpha$       c) Both a and b      d) None of these

2. Answer the following **(any 5)** : 10

- 1) Let  $R = \{(a, b), (b, c), (c, a)\}$ . Find  $R^+$ ,  $R^*$ .
- 2) Design a FA that reads strings made up of letters in the word 'renyolds' and recognize those strings that contain the word 'old' as a substring.
- 3) Define : a) Regular Expression      b) Language.
- 4) Find a CFG for each of the language defined by the following regular expression.  
 i)  $a.b^*$                       ii)  $a^*.b^*$
- 5) What are the applications of pumping lemma ?
- 6) Define closure properties of CFL.

3. A) Answer the following **(any 2)** : 6

- 1) Construct Mealy machine for decrement of binary number by 1.
- 2) Explain simplification of grammar.
- 3) Find regular expression for the following DFA by using Arden's theorem.



B) Construct FA for following RE  $(0+1)^* (0.1)^* (0+1)^*$ . 4



4. Answer the following **(any 2)** : **10**

- 1) What is pumping lemma ? Check  $L = \{a^p \mid p \text{ is prime}\}$  is regular or not.
- 2) Explain left linear and right linear grammar with example.
- 3) Construct PDA that accepts the language generated by CFG.

$$S \rightarrow S + S \mid S^* S \mid 4$$

5. Answer the following **(any 2)** : **10**

- 1) Find GNF for the following grammar.

$$S \rightarrow A + A \mid A * A \mid (A)a$$

- 2) Explain how to convert Moore into Mealy with example.
  - 3) Construct Turing Machine for checking well formdness of parenthesis.
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**B.Sc. (ECS) (Part – III) (Semester – V) (Old) Examination, 2016  
Paper – V : WEB TECHNOLOGY AND E-COMMERCE – I**

Time : 2 Hours

Total Marks : 50

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternative : **10**
- 1) Outbound Logistics in Porter's value chain model is related to \_\_\_\_\_ department.  
a) Sales                      b) Purchase              c) HRM                      d) Administration
  - 2) Negotiation is done in \_\_\_\_\_ element of e-commerce.  
a) EM                      b) EDI                      c) IC                      d) None of these
  - 3) ASP.NET Web Form is inherited from \_\_\_\_\_  
a) System.Web.Form                      b) System.Web.UI.Form  
c) System.Web.UI.Page                      d) System.Web.Form.Page
  - 4) The duration attribute of \_\_\_\_\_ directive's defines how long the page is cached.  
a) @PageCache                      b) @Cache  
c) @Duration Cache                      d) @OutputCache
  - 5) Organisational value chain model is unique in all business sectors.  
a) True                      b) False
  - 6) Global.asax is useful to \_\_\_\_\_  
a) Store web page configuration information  
b) Store style sheet information  
c) Implement application and Session level events  
d) All of these
  - 7) User defined validation is possible using \_\_\_\_\_ validation control.  
a) RequiredField              b) Custom              c) Compare              d) Range
  - 8) \_\_\_\_\_ event of calendar control visit each and every date in calender.  
a) VisitDate                      b) DayRender              c) VisitDay                      d) SelectDate

P.T.O.





- 9) \_\_\_\_\_ property of bulleted list display list items in hyperlink format.
- a) Hyperlink
  - b) LinkButton
  - c) DisplayMode
  - d) DisplayHyperlink
- 10) Business strategy is nothing but \_\_\_\_\_
- a) Formal Plan
  - b) EDI
  - c) EM
  - d) IC
2. Answer the following (**any 5**) : **10**
- 1) Explain AutoPostBack using example.
  - 2) Explain Namespace and which namespace is used for network application.
  - 3) Explain supply chain and value chain.
  - 4) Explain four p's.
  - 5) What is type safety ? Explain with example.
  - 6) Explain use of validationgroup.
3. A) Answer the following (**any 2**) : **6**
- 1) How result of one page transfer to another page ? Explain with example.
  - 2) Explain different e-commerce definitions.
  - 3) Explain file upload control with example.
- B) Explain Automobile and Supermarket value chain in detail. **4**
4. Answer the following (**any 2**) : **10**
- 1) Explain five force model for competitive advantages.
  - 2) Explain custom validation control and create any custom validation for client side and server side.
  - 3) Explain strategic formulation and implementation process.
5. Answer the following (**any 2**) : **10**
- 1) Design web page which add five textboxes using control array.
  - 2) Explain different techniques to add items in checkbox list and write code to display selected item in textbox.
  - 3) What is trade cycle ? Explain generic trade cycle with diagram.
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**B.Sc. (ECS) – III (Semester – V) (Old) Examination, 2016  
VISUAL PROGRAMMING AND APPLICATION SOFTWARE – I (Paper – VI)**

Time : 2 Hours

Max. Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose correct alternative : 10

- 1) Which of the following is not a C# keyword ?  
a) Implements            b) If                    c) Private            d) Delegate
- 2) What is the default access specifier for a Top-level Class, which are not nested into other Classes ?  
a) Public                    b) Private            c) Protected            d) Internal
- 3) A class can have \_\_\_\_\_ static constructor.  
a) One                      b) Two                c) Three                d) Many
- 4) Override method is by default  
a) Public                    b) Virtual            c) Sealed                d) None of the above
- 5) \_\_\_\_\_ operator return result in Boolean form.  
a) Is                        b) As                    c) Both                d) Addition of integer
- 6) Constructor of super class is invoked in the sub class constructor by using  
a) This                      b) Name of constructor  
c) Base                      d) None of these
- 7) CLS stands for  
a) Common Language Specification    b) Common Language Spreadsheet  
c) Common Language System            d) Common Learning System
- 8) Value type data stored on the heap  
a) True                      b) False



- 9) Modulo (%) operator is operate on
- a) Integer only
  - b) Char only
  - c) Floating point only
  - d) Both integer and floating point
- 10) An interface is implemented in
- a) Class only
  - b) Structure only
  - c) Both class and structure
  - d) None of the above

2. Answer the following (**any five**): **10**

- 1) What is static constructor in C# ?
- 2) What is indexer in C# ?
- 3) Write a use of read only field.
- 4) What is boxing and unboxing ?
- 5) Define namespace and assembly.
- 6) What is use of for each loop ?
- 7) Define CLR of .net framework.

3. A) Answer **any two** of the following : **6**

- 1) Differentiate value type and reference type variables in C#.
- 2) Explain nesting try block.
- 3) What is garbage collector ?

B) Write a program for implement method overriding. **4**

4. Answer **any two** of the following : **10**

- 1) What is thread priority ? Explain with e.g.
- 2) Write a program to implement multiple interfaces in C#.
- 3) List and explain characteristics of C# language.

5. Answer **any two** of the following : **10**

- 1) What is visibility control ? List and explain visibility controls in C#.
  - 2) Write a program to copy the content of one text file into another text file.
  - 3) Explain thread life cycle in detail.
-



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**B.Sc. (Entire Computer Science) – III (Semester – VI) (Old) Examination, 2016  
Paper – I : DATA COMMUNICATION AND NETWORKING – II**

Time : 2 Hours

Total Marks : 50

**Instructions:** 1) **All questions are compulsory.**  
2) Figures to the **right** indicate **full** marks.

1. Choose the correct alternatives : **10**

- 1) \_\_\_\_\_ is compromised When an unauthorized person gets access to a message.
  - a) Integrity
  - b) Confidentiality
  - c) Non-repudiation
  - d) Authenticity
- 2) A bridge is \_\_\_\_\_ device.
  - a) Networking
  - b) Connecting
  - c) Internetworking
  - d) Routing
- 3) \_\_\_\_\_ is based on IEEE 802.11 standard.
  - a) VPN
  - b) Repeater
  - c) Wi-Fi
  - d) Virtual LAN
- 4) \_\_\_\_\_ is used to convert message formats from one format to another.
  - a) Firewall
  - b) VPN
  - c) Gateways
  - d) Hubs
- 5) \_\_\_\_\_ protocol is used to access data on the WWW.
  - a) FTP
  - b) POP3
  - c) SMTP
  - d) HTTP
- 6) Transport layer protocols are useful for ensuring \_\_\_\_\_ delivery.
  - a) host-to-host
  - b) host-to-router
  - c) network-to-network
  - d) end-to-end
- 7) \_\_\_\_\_ is a reliable delivery mechanism.
  - a) IP
  - b) TCP
  - c) UDP
  - d) ARP
- 8) When a packet is lost in transit, it should be handled by
  - a) sequence control
  - b) error control
  - c) loss control
  - d) duplication control

P.T.O.



9) IP address \_\_\_\_\_ the physical address.

- a) is the same as
- b) has no relation with
- c) means
- d) none of the above

10) HTTP is called a \_\_\_\_\_ protocol.

- a) stateful
- b) stateless
- c) state-aware
- d) connection-oriented

2. Answer **any five** of the following : **10**

- 1) What is substitution cipher ?
- 2) What is meant by passive hub ?
- 3) What is meant by Digital signature ?
- 4) What is meant by piconet ?
- 5) What is meant by plaintext and cipher key ?
- 6) Define Hub and Switch.

3. A) Answer **any two** of the following : **6**

- 1) What is meant by message non repudiation ?
- 2) Explain repeater in detail.
- 3) Explain user profile of windows 2003 server.

B) Explain use of skype in detail. **4**

4. Write **any two** of the following : **10**

- 1) Explain DNS in detail.
- 2) Explain Samba server in detail.
- 3) Explain bridge in detail.

5. Write **any two** of the following : **10**

- 1) Explain printer server of Linux in detail.
  - 2) Differentiate between TCP and UDP.
  - 3) Explain any two security services in detail.
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**B.Sc. (ECS) – III (Semester – VI) (Old) Examination, 2016**  
**COMPUTER SCIENCE**  
**Paper – II : Database Management System – II**

Time : 2 Hours

Max. Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose the correct alternatives : **10**
- 1) The deadlock state can be changed back to stable state by using \_\_\_\_\_ statement.  
a) Commit      b) Rollback      c) Savepoint      d) Deadlock
  - 2) The log is a sequence of \_\_\_\_\_, recording all the update activities in the database.  
a) Log records      b) Records      c) Entries      d) Redo
  - 3) Trigger are supported in  
a) Delete      b) Update      c) Views      d) All of the mentioned
  - 4) The variables in the triggers are declared using  
a) –      b) @      c) /      d) /@
  - 5) \_\_\_\_\_ Cursor are declared by ORACLE for each UPDATE, DELETE and INSERT SQL commands.  
a) Implicit      b) Explicit      c) Internal      d) External
  - 6) Which of the following is NOT VALID is PL/SQL ?  
a) Bool Boolean;      b) NUM1, NUM2 number;  
c) deptname dept.dname%type;      d) date1 date := sysdate
  - 7) Which of the following is not correct about User Defined Exceptions ?  
a) Must be declared  
b) Must be raised explicitly  
c) Raised automatically in response to an Oracle error  
d) None of the above



- 8) PL/SQL supports datatype(s)
- a) Scalar datatype
  - b) Composite datatype
  - c) Both a) and b)
  - d) None of the above
- 9) Triggers are defined implicitly.
- a) True
  - b) False
- 10) A rollback statement cannot be used to close a transaction.
- a) True
  - b) False

2. Solve **any five** of the following : 10
- 1) %type and %row type in PL/SQL.
  - 2) Advantages of stored procedure.
  - 3) What is schedule ? List its types.
  - 4) What is deadlock ?
  - 5) Write the data types in PL/SQL.
  - 6) What is Serializability ?
3. A) Answer **any two** of the following : 6
- 1) Define Cursor. Explain its types.
  - 2) Explain looping statement in PL/SQL with example.
  - 3) Explain shadow paging.
- B) Write a PL/SQL block to check entered number is palindrome or not using function. 4
4. Answer **any two** of the following : 10
- 1) Differentiate between PL/SQL function and procedure.
  - 2) Define Locking. Explain time-stamp based locking protocol.
  - 3) Explain exception handling in PL/SQL.
5. Solve **any two** of the following : 10
- 1) Write a note on deadlock detection and recovery.
  - 2) What is log-based recovery ? Explain different types of log record.
  - 3) What is transaction ? Explain ACID properties with example.
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**B.Sc. (ECS) (Part – III) (Semester – VI) Examination, 2016  
COMPUTER SCIENCE (Old)  
Paper – III : Advanced Java**

Time : 2 Hours

Max. Marks : 50

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternatives :

10

- 1) \_\_\_\_\_ interface is used for handling button events.  
A) MouseListener                      B) KeyListener  
C) ActionListener                      D) ItemListener
- 2) \_\_\_\_\_ component may have title bar and menu bar.  
A) JWindow      B) JFrame      C) JComponent      D) JPanel
- 3) \_\_\_\_\_ is called for each HTTPRequest.  
A) init( )                      B) service( )  
C) update( )                      D) dead( )
- 4) What servlet processor was developed by Apache Foundation and Sun ?  
A) Apache Tomcat                      B) Apache Web Server  
C) Sun Servlet Processor                      D) None of these
- 5) Which models does JDBC API supports for database access ?  
A) Two-tier models                      B) Three-tier models  
C) Both A) and B)                      D) None of the above
- 6) Which packages represent interfaces and classes for servlet API ?  
A) javax.servlet                      B) javax.servlet.http  
C) both A) and B)                      D) none of the above
- 7) EJB is used to develop which type of applications in Java ?  
A) Scalable                      B) Robust  
C) Secured                      D) All of these





- 8) \_\_\_\_\_ objects are used without need to explicitly declare them.  
A) Explicit      B) Request      C) Response      D) Implicit
- 9) By which method you can access or get the text of a TextField ?  
A) setText( )      B) getText( )      C) both A) and B)      D) none of these
- 10) Separation of business logic from JSP, this is the advantage of  
A) Custom Tags in JSP      B) JSP Standard Tag Library  
C) Both A) and B)      D) None of the above

2. Solve **any five** : **10**
- 1) What is the use of ActionListener interface ?
  - 2) Explain CheckBox component used in Swing.
  - 3) Define DriverManager used for JDBC.
  - 4) What is Cookies in Servlet ?
  - 5) What are the different methods of ResultSet ?
  - 6) What are the kinds of EJB ?
3. A) Solve **any two** : **6**
- 1) What are the different page directives used in JSP ?
  - 2) Explain different JDBC Drivers.
  - 3) What is Servlet ? What are the types of Servlet ?
- B) Write a short note on JApplet. **4**
4. Solve **any two** : **10**
- 1) Explain servlet life cycle.
  - 2) Explain different types of implicit objects used in JSP.
  - 3) Write a short note on deployment descriptor used in servlet.
5. Solve **any two** : **10**
- 1) Write a JDBC program that uses PreparedStatement to insert data in a database.
  - 2) Explain Cookies in Servlet with example.
  - 3) Design a JSP page that accepts roll number and name of student, when user clicks on submit button display the information entered on the next page.
-





- 7) Synthesized attribute can be easily simulated by a
- a) LL grammar
  - b) Ambiguous grammar
  - c) LR grammar
  - d) None of these
- 8) \_\_\_\_\_ allocation is for all the data objects at compile time.
- a) Stack
  - b) Static
  - c) Heap
  - d) All of above
- 9) Shift reduce parsers are
- a) Top down parser
  - b) Bottom up parser
  - c) Either a or b
  - d) Both a and b
- 10) Type checking is normally done during \_\_\_\_\_ phase.
- a) Lexical analysis
  - b) Syntax analysis
  - c) Syntax directed translation
  - d) Code optimization

2. Solve **any five** :

10

1) Define :

- 1) Handle
- 2) Handle Pruning

2) Define Dominators with example.

3) What is the role of lexical analyzer ?

4) What is difference between CLR and LALR ?

5) Find the basic blocks for the following program.

```
prod = 0;
i = 1;
do
{
    prod = prod + a[i] * b[i] ;
    i=i+1;
} while (i <= 10);
```

6) Consider the grammar.

$E \rightarrow E + E, E \rightarrow E * E, E \rightarrow id.$

Perform Shift Reduce Parsing of the input string "id - id \* id".



3. A) Solve **any two** from following questions : 6
- 1) Explain the Pass structure of compiler. Differentiate between Pass and Phase structure of compiler.
  - 2) Explain the concept of Bootstrapping.
  - 3) Draw the Syntax tree and DAG for the expression  $(a*b) + (c+d) * (a*b) + b$ .
- B) Find out triple, quadruple, indirect triple for following. 4
- $P=Q + R * S / T + -U * -V$ .
4. Solve following **any two** questions.: 10
- 1) Check whether following grammar is LL(1) or not.  
 $S \rightarrow AaAb | BbBa, A \rightarrow \epsilon, B \rightarrow \epsilon$ .
  - 2) What is Code Optimization ? Explain principle sources of Code Optimization.
  - 3) Construct LALR(1) for following grammar :  
 $S \rightarrow CC, C \rightarrow aC, C \rightarrow d$ .
5. Solve following questions : 10
- 1) Construct SLR(1) parsing table for following grammar :  
 $E \rightarrow E+T | T, T \rightarrow TF | F, F \rightarrow F^* | a | b$ .
  - 2) What is Code generation ? What are the issues in Code generation ?
  - 3) Explain bottom up evolution of inherited attribute with example.
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Seat No.	
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**B.Sc. (ECS) (Part – III) (Semester – VI) (Old) Examination, 2016  
WEB TECHNOLOGY AND E-COMMERCE – II (Paper – V)**

Time : 2 Hours

Total Marks : 50

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternative : 10
- 1) eBay, Amazon.com and LandsEnd.com belong to \_\_\_\_\_ segment.  
a) B2B                      b) B2C                      c) C2C                      d) None of these
  - 2) Data exchange in EDI system is of \_\_\_\_\_ data type.  
a) Structured                      b) Raw  
c) Unstructured                      d) All of these
  - 3) \_\_\_\_\_ is not ePayment technique.  
a) Stored Value Card                      b) Electronic Check  
c) Delayed Payment                      d) Electronic Cash
  - 4) \_\_\_\_\_ is not an Authentication type in ASP.NET.  
a) File Authentication                      b) Windows Authentication  
c) Passport Authentication                      d) Form Authentication
  - 5) ADO.NET doesn't support disconnected architecture.  
a) True                      b) False
  - 6) A digital signature is \_\_\_\_\_  
a) Signature in binary form                      b) Handwritten signature  
c) Scanned signature                      d) Encrypting information
  - 7) \_\_\_\_\_ state management technique is best suited in a situation where a page stores small amount of frequently changing information.  
a) Cookie                      b) QueryString                      c) HiddenField                      d) View
  - 8) \_\_\_\_\_ properties of a DataGrid View that has to be set for enabling sorting and paging respectively.  
a) EnableSorting and EnablePaging                      b) Sorting and Paging  
c) SetSorting and SetPaging                      d) AllowSorting and AllowingPaging



- 9) Negotiation is included in \_\_\_\_\_ phase.  
a) PreSale                  b) Execution                  c) Settlement                  d) AfterSale
- 10) \_\_\_\_\_ method of Data Adapter control is used to load generated dataset.  
a) Read ( )    b) Load ( )  
c) ExecuteReadre ( )    d) Fill ( )
2. Answer the following (**any 5**) : **10**
- 1) Explain Electronic Market.
  - 2) Define EDI.
  - 3) Search Engines.
  - 4) Logistic Network.
  - 5) Explain client side and server side state management.
  - 6) Explain IC.
3. A) Answer the following (**any 2**) : **6**
- 1) Explain create user wizard control with example.
  - 2) Explain Trade document exchange.
  - 3) Explain hidden field state management technique.
- B) Explain Automobile and Supermakret value chain. **4**
4. Answer the following (**any 2**) : **10**
- 1) Explain disconnect architecture of ADO.Net.
  - 2) What is Internet security ? Explain different security techniques used in e-commerce technology.
  - 3) What are advantages of EDI systems ? Explain in detail.
5. Answer the following (**any 2**) : **10**
- 1) Explain membership management technique with example.
  - 2) Design web page which display employee information according to selected department.
  - 3) Explain following terms :
    - a) Online gambling and
    - b) Software support and supply.
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**B.Sc. (ECS) – III (Semester – VI) (Old) Examination, 2016**  
**COMPUTER SCIENCE**  
**Paper – VI : Visual Programming and Application Software – II**

Time : 2 Hours

Max. Marks : 50

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose correct alternative : **10**
- 1) Which of the following control is always read-only ?
    - a) TextBox
    - b) Label
    - c) RichTextBox
    - d) RichBox
  - 2) In event-driven programming an event is generated by a user's action
    - a) True
    - b) False
  - 3) LINQ query can work with
    - a) DataSet
    - b) Array
    - c) Both a) and b)
    - d) None of these
  - 4) Which of the following assemblies can be stored in Global Assembly Cache ?
    - a) Private Assemblies
    - b) Friend Assemblies
    - c) Shared Assemblies
    - d) Public Assemblies
  - 5) The CheckState property gets or sets the state of CheckBox
    - a) True
    - b) False
  - 6) All delegates are implicitly derived from the System.Event class
    - a) True
    - b) False
  - 7) The method that will be invoked by a delegate at
    - a) Compile time
    - b) Run time
    - c) Load time
    - d) Link time







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**B.Sc. (ECS) – III (Semester – VI) (New) Examination, 2016  
Paper – I : DATA COMMUNICATION AND NETWORKING – II**

Time : 2 Hours

Max. Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
2) **Figures to the right indicate full marks.**

1. Choose the correct alternative and rewrite the answer : **10**

1) \_\_\_\_\_ server can serve files and printers that is faster and secure in Linux.

- a) Samba                      b) Print                      c) Web                      d) FTP

2) \_\_\_\_\_ protocol is used to provide facility for remote logins to computer via Internet.

- a) POP                      b) SNMP                      c) ARD                      d) Telnet

3) \_\_\_\_\_ is a malicious software which is stand alone application.

- a) Trojan                      b) Worm                      c) Virus                      d) None

4) \_\_\_\_\_ operates at the upper layer of OSI Model.

- a) Gateway                      b) Browser                      c) Bridge                      d) Hub

5) \_\_\_\_\_ is cryptographic protocol designed to provide communication security over network.

- a) Ip    b) Transport layer security  
c) Pop    d) Http

6) Encryption algorithm transforms plaintext into

- a) corrected text    b) code text                      c) cipher text                      d) all

7) MIME stands for

- a) Multipurpose Internet Mail Extension  
b) Multiple Internal Mail Extension  
c) Mini Internet Mail Expansion  
d) None



- 8) \_\_\_\_\_ comprises mobile stations and Base stations.
  - a) Router system
  - b) Radio subsystem
  - c) Roaming station
  - d) None
- 9) A computer dedicated to receive incoming e-mail and forward outgoing e-mail is called
  - a) File server
  - b) Proxy server
  - c) Print server
  - d) Mail server
- 10) Piconet can be combined to form
  - a) fiber net
  - b) pico spot
  - c) scatter net
  - d) a and b both

- 2. Answer the following **any five** : **10**
  - 1) Explain Cryptography.
  - 2) Differentiate between Hub and Switch.
  - 3) List the responsibilities of Network administrator.
  - 4) Write the benefits of VPN.
  - 5) What is Data Compression ?
  - 6) What is IPSec ?
- 3. A) Answer the following **any two** : **6**
  - 1) Explain Video Conferencing.
  - 2) Write a note on Samba Server.
  - 3) What is Firewall ? Write the applications of Firewall.
- B) Write a note on Digital Signature. **4**
- 4. Answer the following **any two** : **10**
  - 1) Explain how SSL works.
  - 2) Explain Address Mapping.
  - 3) Explain GSM.
- 5. Answer the following **any two** : **10**
  - 1) Explain User and Group Management in LINUX.
  - 2) Write a note on Encryption.
  - 3) Discuss Authentication Mechanism.

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**B.Sc. (ECS) – III (Semester – VI) (New) Examination, 2016**  
**COMPUTER SCIENCE**  
**Database Management System – II (Paper – II)**

Time : 2 Hours

Max. Marks : 50

- Instructions :** 1) **All** questions are **compulsory**.  
2) **Each** question carries **equal** marks.  
3) Figures to the **right** indicate **full** marks.

1. Choose correct alternatives :

10

- 1) Which of the following is not a property of transaction ?
  - a) Atomicity
  - b) Isolation
  - c) Durability
  - d) Concurrency
- 2) \_\_\_\_\_ is assignment operator in PL/SQL.
  - a) ==
  - b) =
  - c) :=
  - d) None of these
- 3) The maximum length of varchar 2 when used in a table is \_\_\_\_\_
  - a) 16 K
  - b) 32 K
  - c) 4 K
  - d) Either b) or c)
- 4) ROWID is a data type.
  - a) True
  - b) False
- 5) An initial state of transaction is \_\_\_\_\_
  - a) Active
  - b) Final
  - c) Partial
  - d) Aborted



- 6) Recovery techniques are \_\_\_\_\_
- a) Serializability
  - b) Shadow paging
  - c) Write ahead laggin
  - d) ARIES
- 7) The query associated with a cursor is executed in \_\_\_\_\_
- a) Declare phase
  - b) Open phase
  - c) Fetch phase
  - d) Close phase
- 8) Comments in a PL/SQL code are inserted using \_\_\_\_\_
- a) --
  - b) /\* \*/
  - c) Both a) and b)
  - d) /
- 9) Disk is example of \_\_\_\_\_
- a) Volatile storage
  - b) Non volatile storage
  - c) Both a) and b)
  - d) None of these
- 10) An oracle PL/SQL block is always \_\_\_\_\_
- a) Interpreted
  - b) Compiled
  - c) Interpreted and then compiled
  - d) Either a) or b)

2. Answer **any five** of the following :

10

- 1) List data types of PL/SQL.
- 2) Define transaction.
- 3) What are the state of transaction ?
- 4) Define deadlock.
- 5) Explain save points.
- 6) Define scheduling.



3. A) Answer **any two** of the following : **6**
- 1) Explain failure classification.
  - 2) What is serializability ? Explain view equivalence and conflict equivalences.
  - 3) Explain lock based protocols.
- B) What is cursor ? Explain types of cursor. **4**
4. Answer **any two** of the following : **10**
- 1) Explain shadow paging and advantages of shadow paging.
  - 2) What is transaction ? Explain ACID properties of transaction.
  - 3) Write a PL/SQL block to check given number is Armstrong or not ?
5. Answer **any two** of the following : **10**
- 1) Write a PL/SQL block to find factorial number by using function.
  - 2) Explain Trigger with example.
  - 3) Write the difference between procedure and function with example.
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**B.Sc. (ECS) (Part – III) (Semester – VI) Examination, 2016**  
**COMPUTER SCIENCE**  
**Paper – III : Advanced Java (New)**

Time : 2 Hours

Max. Marks : 50

**Instructions :** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternatives :

10

- 1) \_\_\_\_\_ interface is used for handling events generated by JCheckBox.  
A) MouseListener                      B) KeyListener  
C) ActionListener                      D) ItemListener
- 2) \_\_\_\_\_ component may have Title bar and Menu bar.  
A) JWindow      B) JFrame      C) JComponent      D) JPanel
- 3) \_\_\_\_\_ is called for each HTTPRequest.  
A) init( )      B) service( )      C) update( )      D) dead( )
- 4) By which method you can set or change the text in a label ?  
A) setText( )                      B) getText( )  
C) Both A) and B)                      D) None of the above
- 5) In JDBC \_\_\_\_\_ types of drivers are used.  
A) 1                      B) 2                      C) 3                      D) 4
- 6) Which packages is used for JDBC ?  
A) java.database      B) java.net      C) java.sql      D) javax.ejb
- 7) EJB is used to develop which type of applications in java ?  
A) Scalable      B) Robust      C) Secured      D) All of these
- 8) \_\_\_\_\_ objects are used without need to explicitly declare them.  
A) Implicit      B) Request      C) Response      D) Explicit
- 9) A JSP page consists of which tags ?  
A) HTML tags                      B) JSP tags  
C) Both A) and B)                      D) None of the above
- 10) Separation of business logic from JSP this is the advantage of  
A) Custom Tags in JSP                      B) JSP Standard Tag Library  
C) Both A) and B)                      D) None of the above

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2. Solve **any five** : **10**
- 1) What is the use of adapters instead of listeners ?
  - 2) Explain the use of JScrollPane.
  - 3) What is ResultSet ? What are the methods of ResultSet ?
  - 4) What is servlet ? What are the types of servlet ?
  - 5) What are the applications of EJB ?
  - 6) What is the use of scriptlet tag in JSP ? Write its syntax.
3. A) Solve **any two** : **6**
- 1) What are the different attributes of page directive used in JSP ?
  - 2) Explain type-4 JDBC drivers. What are its advantages and disadvantages ?
  - 3) What is EJB ? Explain entity bean.
- B) Write a short note on Icons and Labels in swing. **4**
4. Solve **any two** : **10**
- 1) Explain different types of HttpRequest methods.
  - 2) Explain different types of event classes used in event handling.
  - 3) Write a short note on deployment descriptor used in servlet.
5. Solve **any two** : **10**
- 1) Write a JDBC program that uses PreparedStatement to insert data in employee table.
  - 2) Write a program to handle doPost( ) method in servlet.
  - 3) Explain different types of implicit objects used in JSP.
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**B.Sc. (ECS) III (Semester – VI) (New) Examination, 2016  
COMPILER CONSTRUCTION (Paper – IV)**

Time : 2 Hours

Max. Marks : 50

**Instructions :** 1) **All questions are compulsory.**  
2) **All questions carry equal marks.**

1. Choose correct alternatives : 10

1) Type checking is normally done during \_\_\_\_\_ phase.

- a) Lexical analysis
- b) Syntax analysis
- c) Syntax directed translation
- d) Code optimization

2) What are x and y in the following macro definition ?

macro

Add x, y

Load y

Mul x

Store y

end macro

- a) Variable
- b) Identifier
- c) Actual parameter
- d) Formal parameter

3) Shift reduce parsers are

- a) Top down parser
- b) Bottom up parser
- c) Either a or b
- d) Both a and b

4) The \_\_\_\_\_ is a flow graph in which there are two types of edges forward edges and backward edges.

- a) inner loops
- b) pre-header
- c) reducible
- d) all of above





- 5) \_\_\_\_\_ can perform functions like deleting comments, extra blanks spaces and extra blank lines, keeping track of line numbers.
- a) Lexical analyzer                                  b) Syntax analyzer  
c) Semantic analyzer                                d) None of these
- 6) Which of the following is not an intermediate code form ?
- a) Postfix notation                                  b) Syntax trees  
c) Three address codes                              d) Quad.
- 7) In run time environment each node represents \_\_\_\_\_ of a procedure.
- a) definition                  b) declaration          c) activation          d) all of the above
- 8) \_\_\_\_\_ is the sequence of statements in compiler.
- a) Three address code                              b) Syntax errors  
c) Both a and b                                      d) None of these
- 9) SLR parser is more powerful in CLR parser.
- a) True    b) False
- 10) The \_\_\_\_\_ is optional phase of compiler.
- a) Lexical analyzer                                b) Syntax analyzer  
c) Code optimization                              d) Code generation

2. Solve **any five** :

10

- 1) What is short circuit code ?
- 2) Write short note on input buffering.
- 3) What are the actions available in shift reduce parser ?
- 4) Define :  
    1) Handle                      2) Handle Pruning
- 5) Give the names of operations in symbol table.
- 6) Write triple representation for  $x = y[i]$ .

3. A) Solve **any two** from following questions :

6

- 1) Explain the role of syntax analyzer.
- 2) Explain peephole optimization in detail.
- 3) What is difference between SLR and CLR ?

B) Find out the first and follows of following grammar :

4

$S \rightarrow aABb, A \rightarrow c \mid \epsilon, B \rightarrow d \mid \epsilon.$



4. Solve following questions : 10

1) Find out quadruple, triple and indirect triple for following :

$$a := b * - c + b * - c * d ;$$

2) Explain error recovery strategies in detail.

3) Construct a syntax tree for  $a - 4 + c$  and write a sequence of instructions.

5. Solve following questions : 10

1) Check following grammar is LL (1) grammar or not ?

$$S \rightarrow BC \mid AB, A \rightarrow aAa \mid \epsilon, B \rightarrow bAa, c \rightarrow \epsilon.$$

2) What is parameter ? Explain the parameter passing techniques with example.

3) How to specify and recognize the tokens ?

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**B.Sc. (ECS) (Part – III) (Semester – VI) (New) Examination, 2016  
Paper – V : WEB TECHNOLOGY AND E-COMMERCE – II**

Time : 2 Hours

Max. Marks : 50

**Instructions:** 1) *All questions are compulsory.*  
2) *Figures to the right indicate full marks.*

1. Choose the correct alternative :

10

- 1) \_\_\_\_\_ is one of the Authentication mode in ASP.NET.  
a) Client                      b) Server                      c) Passport                      d) File
- 2) Server side state management have permanent storage.  
a) True    b) False
- 3) In \_\_\_\_\_ state management technique, the hidden form fields are used to store data.  
a) Application                      b) Session                      c) View                      d) QueryString
- 4) \_\_\_\_\_ control has a in-built support for Sort, Filter and paging the Data.  
a) TextBox                      b) Repeater                      c) FormView                      d) GridView
- 5) \_\_\_\_\_ event handling method is fired whenever a new user request is received.  
a) Page-Load    b) Application\_Start  
c) Session\_Start    d) None of these
- 6) \_\_\_\_\_ is default parameter direction.  
a) Input                      b) Output                      c) InOut                      d) None
- 7) SQL query is assigned to CommandText property of command object when CommandType is \_\_\_\_\_  
a) TableDirect    b) Text  
c) Stored Procedure    d) Query
- 8) An electronic check is one form of \_\_\_\_\_ technique in e-commerce.  
a) Payment                      b) Security                      c) Delivery                      d) All of these



- 9) \_\_\_\_\_ is not the pillar in e-commerce security.
- a) Integrity
  - b) Confidentiality
  - c) Authentication
  - d) Password
- 10) \_\_\_\_\_ is not one of the term used in EDI definition.
- a) Security
  - b) Structured Date
  - c) Electronic Means
  - d) Agreed message standard

2. Answer the following (**any 5**) : **10**
- 1) What is Electronic market ?
  - 2) What is Logistics Network ? Explain with diagram.
  - 3) Explain portals in detail.
  - 4) Explain connection string.
  - 5) Explain search engine.
  - 6) Explain create user wizard control.
3. A) Answer the following (**any 2**) : **6**
- 1) Explain data reader in detail.
  - 2) Explain definition of EDI in detail.
  - 3) Explain Dataset in detail.
- B) Explain trade cycle document exchange. **4**
4. Answer the following (**any 2**) : **10**
- 1) What is state management ? Explain client side state management in detail.
  - 2) What is use of gridview control ? Explain gridview control with example.
  - 3) What is security techniques used in e-commerce ? Explain in detail.
5. Answer the following (**any 2**) : **10**
- 1) Explain different steps used in web site administrator tool.
  - 2) Explain website evolution model in detail.
  - 3) Explain different facilities provided by e-shop.
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**B.Sc. (ECS) – III (Semester – VI) (New) Examination, 2016**  
**Paper – VI : VISUAL PROGRAMMING AND APPLICATION SOFTWARE – II**

Time : 2 Hours

Max. Marks : 50

**Instructions:** 1) **All questions are compulsory.**  
2) **Figures to the right place indicate full marks.**

1. Choose the correct alternative : 10
- 1) Which of the following is the feature of LINQ ?
    - a) It is compatible data source
    - b) Easy to write the queries
    - c) Easy to understand and maintain
    - d) All of these
  - 2) Private assemblies reduce the need of disk and memory space.
    - a) True
    - b) False
  - 3) LINQ query ends with \_\_\_\_\_ clause.
    - a) From
    - b) Group by
    - c) Both a) and b)
    - d) None of these
  - 4) Which of the following assemblies can be stored in Global Assembly Cache ?
    - a) Private Assemblies
    - b) Shared Assemblies
    - c) Public Assemblies
    - d) Local Assemblies
  - 5) Delegates are useful for
    - a) Binding methods at run-time
    - b) Event handling
    - c) Multithreading
    - d) All of these
  - 6) MDI applications are used to show multiple instances of the same type of form.
    - a) True
    - b) False
  - 7) Invoke the related event by supplying an event handler using the \_\_\_\_\_ operator.
    - a) =
    - b) +=
    - c) = +
    - d) ==

P.T.O.

