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B.Sc. – I (ECS) (Semester – I) (CGPA Pattern) Examination, 2014
ENGLISH (Compulsory)
‘On Track’ English Skills for Success

Day and Date : Saturday, 1-11-2014
Time : 3.00 p.m. to 6.00 p.m.

Max. Marks : 70

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

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

14

- 1) The story, ‘After Twenty Years’ implies that ‘Silky’ Bob is a _____
 - a) Police Officer
 - b) Gangster or Criminal
 - c) Restaurant owner
 - d) Private detector
- 2) The policeman on the beat moved up the avenue _____
 - a) impressively
 - b) nervously
 - c) unwillingly
 - d) lazily
- 3) The narrator and Miss Krishna first met at _____
 - a) a mall
 - b) a restaurant
 - c) a circus
 - d) an exhibition
- 4) The word ‘intelligence’ is derived from the Latin word _____
 - a) intellectual
 - b) intellect
 - c) intellegere
 - d) none of the above
- 5) Mrs. Lall thought that one cup in her set was broken by _____
 - a) the cook
 - b) the maid
 - c) herself
 - d) her daughter
- 6) Mr. Binet was the _____ who developed IQ Test.
 - a) Philosopher
 - b) Psychologist
 - c) Mathematician
 - d) Physicist



- 7) The phrase 'shining loads' means _____
- a) an unmarried woman's wrist
 - b) bunches of bangles
 - c) the flame of marriage fire
 - d) sunlit corn
- 8) In 'Bangle Sellers' the speaker is a _____
- a) middle aged woman
 - b) young unmarried woman
 - c) bangle customer
 - d) bangle seller
- 9) The poem 'An Irish Airman Foresees His Death' relates to _____
- a) the plight of Irish soldiers fighting for UK
 - b) the glory of war
 - c) common man's attitude to war
 - d) the importance of peace
- 10) I don't believe _____ superstitions.
- a) on
 - b) with
 - c) in
 - d) upon
- 11) A man is known by _____ company he keeps.
- a) a
 - b) the
 - c) an
 - d) none of the above
- 12) The winner team was honoured by the guest.
The underlined words is a _____ noun.
- a) proper
 - b) common
 - c) collective
 - d) material
- 13) His clients are happy _____ Monty's work.
- a) for
 - b) after
 - c) on
 - d) with
- 14) Sarita cut _____ while chopping vegetables.
- a) herself
 - b) itself
 - c) himself
 - d) myself



2. Answer in brief **any seven** of the following questions : 14
- 1) Why does Jimmy send another policeman to arrest Bob ?
 - 2) What was the nickname for Bob that the plain clothes Policeman used ?
 - 3) What is the narrator's profession in 'The Connoisseur' ?
 - 4) What are the many facets of intelligence ?
 - 5) Why did the narrator consider Miss Krishna annoying guest ?
 - 6) What are the merits of artificial intelligence ?
 - 7) What are the bangles 'tokens' of ?
 - 8) Who is the speaker in the poem 'An Irish Airman Foresees His Death' ?
3. A) Write short notes on **any two** of the following : 8
- 1) The relationship between Bob and Jimmy.
 - 2) Miss Krishna's character.
 - 3) Etymological background of the word 'intelligence'.
- B) Answer **any three** of the following questions briefly : 6
- 1) What image of the bangle sellers at the temple fair do you gather from the poem ?
 - 2) How does the bangle seller enhance the quality of life of simple people and bring joy and colour to it ?
 - 3) What is the Speaker's attitude towards those that he fights against in the poem 'An Irish Airman Foresees His Death'.
 - 4) How does the Irish Airman imagine he will die ?
4. Write an essay on the topic 'The Problem of City Slums and Possible Humane Solutions'. 14

OR

Write paragraphs of **six to eight** sentences on **each** of the following :

- 1) Human values are timeless and eternal.
- 2) Solar energy.



5. Read the following passage and make notes of it. Use an appropriate title for your notes :

14

One of our most difficult problems is what we call discipline, and it is really very complex. You see, society feels that it must control or discipline the citizen, shape his mind according to certain religious, social, moral and economic patterns.

Now, is discipline necessary at all ? Please listen carefully, don't immediately say 'yes' or 'no'. Most of us feel, especially while we are young, that there should be no discipline, that we should be allowed to do whatever we like, and we think and so on, has very little meaning without understanding the whole problem of discipline.

The keen athlete is disciplining himself all the time, is he not ? His joy in playing games and the very necessity to keep fit makes him go to bed early, refrain from smoking, eat the right food and generally observe the rules of good health. His discipline is not an imposition or a conflict, but a natural outcome of his enjoyment of athletics.

Now does discipline increase or decrease human energy ? Human beings throughout the world, in every religion, in every school of philosophy, impose discipline on the mind, which implies control, resistance, adjustment, suppression : and is all this necessary ? If discipline brings about a greater output of human energy, then it is worthwhile, then it has meaning; but if it merely suppresses human energy ; it is very harmful, destructive. All of us have energy and the question is whether that energy through discipline can be made vital, rich and abundant, or whether discipline is allowed to destroy whatever energy we have. I think this is the central issue.



Seat No.	
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B.Sc. – I (E.C.S.) (Semester – I) Examination, 2014
MATHEMATICS (Paper – V) (Old)
Graph Theory

Day and Date : Saturday, 8-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

- N.B. :** i) **Use of scientific calculator is allowed.**
ii) **All questions are compulsory.**
iii) **Figures to the right indicate full marks.**

1. Choose correct alternative for **each** of the following : **10**

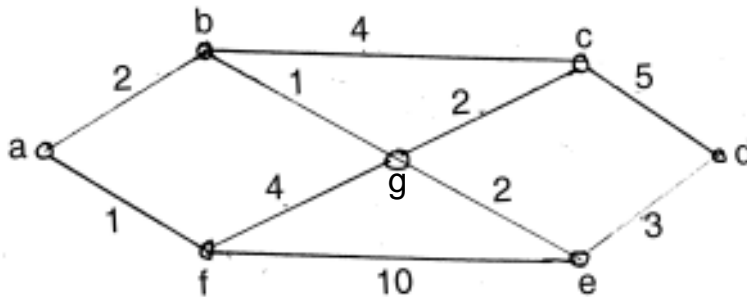
- 1) The number of edges in a complete graph K_6 is _____
 - a) 10
 - b) 15
 - c) 20
 - d) 6
- 2) The complement of a complete graph is _____ graph.
 - a) Complete
 - b) Simple
 - c) Null
 - d) None of these
- 3) The maximum number of edges in a simple graph of n -vertices and k -components is _____
 - a) $\frac{n(n-k)}{2}$
 - b) $\frac{n-k+1}{2}$
 - c) $\frac{(n+k)(n+k+1)}{2}$
 - d) $\frac{(n-k)(n-k+1)}{2}$
- 4) A tree with 7-vertices has _____ number of edges
 - a) 7
 - b) 6
 - c) 8
 - d) none of these
- 5) A closed walk in which no vertex is repeated except terminal vertex is called _____
 - a) Walk
 - b) Trail
 - c) Tour
 - d) Cycle



- 2) Draw the graph $K_{2,4}$ and K_{33} .
- 3) Prove that if G_1 and G_2 are disjoint simple graphs then the complements of their join (union) is the union of their complement.
- B) If $G = (V, E)$ be any graph then prove that the sum of degrees of all vertices of G is the twice the number of edges of G . 4

4. Attempt **any two** from the following : 10

- 1) By using Dijkstra's algorithm, find the shortest path between a to d for the following weighted graph.



- 2) Explain the Chinese Postman problem.
- 3) Draw all possible, non isomorphic trees on 7-vertices.

5. Attempt **any two** from the following : 10

- 1) Explain Kruskal's algorithm to find the shortest spanning tree of any graph.
- 2) Give an example of a graph which is :
 - a) Eulerian but not Hamiltonian
 - b) Hamiltonian but not Eulerian
 - c) Neither Hamiltonian nor Eulerian.
- 3) Define :
 - a) Weighted graph
 - b) Spanning sub graph
 - c) Self complementary graph.



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B.Sc. (ECS) (Part – I) (Semester – I) Examination, 2014
MATHEMATICS (Paper – VI) (Old)
Numerical Methods

Day and Date : Monday, 10-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

- N. B. :** 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 for **each** of the following : **10**

- 1) While doing multiplication of two numbers in normalised floating point form, the exponents should be _____
 - a) added
 - b) subtracted
 - c) multiplied
 - d) divided
- 2) $0.1234 E4 \times 0.8735 E4 =$ _____
 - a) $1.2345 E4$
 - b) $0.1078 E8$
 - c) $0.1078 E4$
 - d) $0.1078 E0$
- 3) $\nabla f(x) =$ _____
 - a) $f(x + h) - f(x)$
 - b) $f(x) - f(x - h)$
 - c) $f(x - h) - f(x)$
 - d) $f(x) - f(x + h)$
- 4) One of the roots of equation $f(x) = 0$ lies in the interval (a, b) iff $f(a)$ and $f(b)$ have _____ sign.
 - a) same
 - b) plus
 - c) minus
 - d) opposite
- 5) If the data is equally spaced and interpolation is near the end of the data then _____ interpolation formula is used.
 - a) Newton's Forward Difference
 - b) Newton's Backward Difference
 - c) Newton's Divided Difference
 - d) Lagrange's



6) The equation $\tan x - x = 0$ is _____ equation.

- a) linear
- b) tangent
- c) transcendental
- d) none of these

7) Runge-Kutta II order method is used to solve _____ equations.

- a) differential
- b) integral
- c) linear
- d) interpolating

8) If each variable of the system of m-linear equations in n-variables is leading variable then the system posses _____ solutions.

- a) infinity
- b) unique
- c) no
- d) infinitely many

9) $8.2132 \text{ E}4 \div 2.2132 \text{ E}2 =$ _____

- a) 0.19494 E3
- b) 0.19494 E2
- c) 1.9494 E3
- d) 0.19494 E6

10) Simpson's $(3/8)^{\text{th}}$ rule is obtained by putting $n =$ _____ in general quadrature formula.

- a) 0
- b) 1
- c) 2
- d) 3

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

10

1) Write augmented matrix for the following system of linear equations :

$$x_1 + x_2 + x_3 - 2x_4 = 2 ; -2x_1 + 3x_2 = 3 ; 3x_1 - x_2 + 4x_3 = -2.$$

2) State Lagrange's Interpolation formula for the data containing three arguments x_0, x_1 and x_2 .

3) Find the interval in which root of the equation $x^3 - 4x + 1 = 0$ lies.

4) Define shift operator E and inverse shift operator E^{-1} .

5) Define homogeneous system of linear equations.

6) State Newton-Raphson formula to find first approximation for the root of equation $f(x) = 0$.

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

6

1) Find inverse of the following matrix if exists by using row reduction method.

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix} 3 \times 3$$



2) Prepare forward difference table for the following data :

x	0	2	4	6
y = f(x)	100	129	137	154

3) Define absolute error, relative error and percentage error.

B) Evaluate $\left[\frac{\Delta^2}{E} \right] x^3$ by taking $h = 1$. 4

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

1) Use Euler's method to estimate value of y at $x = 1.4$ for the differential equation

$$\frac{dy}{dx} = x^2 + y . \text{ Given that } y(1) = 2, h = 0.1.$$

2) Evaluate $\int_0^{\pi/2} \sin x \cdot dx$ by using Trapezoidal rule by dividing the interval into 6 equal parts.

3) Derive Newton-Raphson formula to find root of equation $f(x) = 0$.

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

1) Find real root of the equation $x^3 - 2x - 5 = 0$. Correct upto 4 decimal places by using Newton-Raphson method. Take initial approximation $x_0 = 2.5$.

2) Estimate the value of y at $x = 5$ for the data given below :

x	3	6	9	12	15
y = f(x)	6	30	75	132	210

3) Solve the following system of linear equations by using Gauss-Jordan Elimination method :

$$2x + 4y - z = 0 ;$$

$$x - y + z = 0 ;$$

$$3x + 5y - z = 0.$$



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B.Sc. (E.C.S.) (Semester – I) Examination, 2014
STATISTICS (Paper – VII) (Old)
Descriptive Statistics – I

Day and Date : Tuesday, 11-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

- Instructions:** 1) **All questions are compulsory.**
2) **All questions carry equal marks.**
3) **Use of any type of calculator is allowed.**
4) **Figures to the right indicate full marks.**
5) **Graph paper will be supplied on request.**

1. Choose most correct alternative :

10

- 1) Which one of the following is an illustration of sample ?
 - a) Handful of grains
 - b) Examining blood of an individual
 - c) Testing quality of milk
 - d) All of the above
- 2) Population Census of India is conducted after every
 - a) 3 years
 - b) 5 years
 - c) 6 years
 - d) 10 years
- 3) Drinking habit of a person is
 - a) an attribute
 - b) a discrete variable
 - c) a continuous variable
 - d) a variable
- 4) A continuous frequency distribution gives
 - a) No. of items belongs to a class
 - b) No. of times a value is repeated in the data
 - c) a) and b) both
 - d) None of these
- 5) The sum of deviations taken from A.M. is always equal to
 - a) One
 - b) Zero
 - c) Lies between 0 and 1
 - d) None of these

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- 6) If all observations are doubled, then its mode becomes
- a) doubled
 - b) as it is
 - c) increased by 2
 - d) none of these
- 7) Measure of dispersion that based on extreme observation is
- a) S.D.
 - b) C.V.
 - c) Coefficient of Range
 - d) All of these
- 8) If (C.V.) Group – I < (C.V.) Group – II then
- a) Group – I is more consistent
 - b) Group – II is more consistent
 - c) Group – I is more heterogeneous
 - d) None of these
- 9) The first order raw moment is always equal to
- a) Mean
 - b) Median
 - c) Mode
 - d) Quartile
- 10) If the Karl Pearson's coefficient of Skewness is 0.25 then frequency distribution is
- a) Symmetric
 - b) Negatively skewed
 - c) Positively skewed
 - d) None of these

2. Attempt **any five** :

10

- 1) Define statistical population and sample.
- 2) Define class-frequency and class-width.
- 3) Find median of the observations :
4, 3, 5, 4, 6, 8, 9, 4, 5, 6
- 4) The mean and S.D. of 100 observations are 50 and 10 respectively. Find new mean and S.D. if each observation is multiplied by 5.
- 5) The first two moments of a distribution about the value 4 are 3 and 34. Find variance.
- 6) Given : $\mu'_1 = 2, \mu'_2 = 20, \mu'_3 = 40$ Find μ_3 .



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

1) Explain how to determine median graphically.

2) Find mean and mode from the following data :

No. of printing mistakes	:	1	2	3	4	5	6
No. of pages	:	5	8	12	7	4	3

3) Calculate C.V. of a series on the basis of the following results :

$$n = 50, \sum (X - 7.5) = -10, \sum (X - 7.5)^2 = 400.$$

B) The first three moments of a distribution about 0.2 are 1, 22, 10. Find its mean, S.D. and third central moment. 4

4. Attempt **any two** : 10

1) Explain the construction of Pie-diagram.

2) Find missing frequency in the following distribution if the median of the distribution is 33 :

Age (in years)	:	10 – 20	20 – 30	30 – 40	40 – 50	50 and above
No. of persons	:	21	20	–	15	14

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

X	:	11	12	13	14	15
f	:	3	8	10	5	4

5. Attempt **any two** : 10

1) Define weighted A.M. State the requirements of a good measure of central tendency.

2) What are the raw and central moments of a distribution ? Express the first four central moments in terms of the raw moments.

3) For the data below, draw a histogram and hence find the modal value :

Mid-value	:	25	35	45	55	65
Frequency	:	5	12	33	13	7



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B.Sc. (E.C.S.) (Part – I) (Semester – I) Examination, 2014
PROBABILITY THEORY – I (Paper – VIII) (Old)

Day and Date : Wednesday, 12-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose most correct alternative : 10

- 1) A discrete r. v. X has binomial distribution with mean = 4 and var = 2.4, then the value of parameter P = _____
a) 0.45 b) 0.5 c) 0.6 d) 0.4
- 2) A r. v. X taking values 10, 20, 30, 40, 50 has discrete uniform distribution , then $P(X = 35) =$ _____
a) $1/5$ b) $1/3$ c) 0.35 d) Zero
- 3) Variance of a constant is always _____
a) Zero b) Constant itself
c) 1 d) None of these
- 4) Let $F_X(x)$ is c.d.f. of discrete r.v. X , then _____
a) $F(-\infty) = 0$ b) $F(\infty) = 1$
c) $F_X(x)$ is step function d) All of these
- 5) If A and B are independent events with $P(A \cap B) = 0.2$, $P(B) = 0.4$, then $P(A) =$ _____
a) 0.4 b) 0.5 c) 0.2 d) None of these
- 6) An unbiased coin is tossed. Let A : getting Head, B : getting Tail, then A and B are _____
a) Mutually exclusive events b) Equally likely events
c) Exhaustive events d) All of these



- 7) A random experiment has _____ out comes.
 a) More than one b) Sure
 c) Unique d) Only one
- 8) Number of ways by which 2 persons out of 5 are selected so that one particular person is always include is
 a) 4P_2 b) 5P_2 c) 4C_2 d) 5C_2
- 9) Multiplication principle of counting provides number of ways in which _____ operations can be done sequentially.
 a) One of the b) Some of the c) All of the d) None of these
- 10) Combination is _____ selection of some or all of given things.
 a) Unordered b) Ordered c) Conditional d) None of these

2. Attempt **any five** :

10

- 1) State multiplication principle of counting.
- 2) Define sure event.
- 3) Define p.m.f.
- 4) Find value of n, of ${}^{n+1}C_3 = \frac{4}{3} {}^n p_2$.
- 5) Given : $P(A) = 0.6$, $P(B) = 0.7$, $P(A \cap B) = 0.35$ find $P(\bar{A} \cap B)$
- 6) State additive property of Poisson distribution.

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

6

- 1) The p.m.f. of r.v.X is given as follows :

X : 3 6 9 12 15

p(x) : 0.4 0.2 0.1 0.1 0.2

Find $E(X + 2)$.

- 2) Let $X \rightarrow B(8, 0.4)$. Find $p(X < 2)$.
- 3) Define permutations. State formula for no. of permutations with and without expectations.

- B) A card is drawn from a pack of 52 playing cards at random. Let A : Card drawn is Black; B : Card drawn is picture. Find $p(B / A)$.

4



4. Attempt **any two** : **10**

- 1) Define Hypergeometric distribution. State the conditions under which it is applicable.
- 2) 5 persons are to be sitted in a row for photograph. Find number of sitting arrangements if i) 2 persons X and Y are always together ii) X and Y never together.
- 3) If $P(A) = 0.25$, $P(B/A) = 0.5$, $P(A/B) = 0.33$. Find $P(A \cup B)$.

5. Attempt **any two** : **10**

- 1) State Axioms of probability; hence prove that probability of an impossible event is zero.
- 2) The c.d.f. of r.v.X is as follows :

X :	-3	-2	-1	0	1	2	3
F(x) :	0.05	0.15	0.38	0.57	0.72	0.88	1

Find i) $p(|X| < 2)$ ii) $p(-2 < X < 3)$.

- 3) A discrete r.v. X taking values 5, 10, 15, 20, 25, 30 has uniform distribution. Find $V(X)$
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**B.Sc. (ECS) – I (Semester – II) Examination, 2014
COMPUTER FUNDAMENTALS – II (Paper – I)**

Day and Date : Saturday, 1-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives : 10

- 1) The extension of batch file is _____
a) .xls b) .doc c) .txt d) .bat
- 2) Communication can take place in both direction but not simultaneously is called _____
a) Simplex b) Half duplex
c) Full duplex d) None
- 3) In _____ topology every node is connected to each other.
a) Star b) Bus c) Ring d) Mesh
- 4) To save a new text file _____ short cut key is used.
a) Ctrl + z b) Ctrl + o c) Ctrl + s d) Ctrl + v
- 5) tag is paired tag
a) True b) False
- 6) To insert image <insert> tag is used.
a) True b) False
- 7) _____ do not provides network resources.
a) Client b) Server c) Peers d) None
- 8) The tag used in HTML to link it with other URL's is _____
a) <A> b) <H> c) <V> d) <L>



- 9) In _____ only one CPU is involved, but it switches from one program to another quickly.
- a) Multitasking
 - b) Multiprocessing
 - c) Multiprogramming
 - d) None
- 10) _____ is a menu which is displayed by right clicking the mouse.
- a) Programs
 - b) Cascade
 - c) Pull down
 - d) Short cut

2. Answer **any five** of the following : **10**
- 1) Define modem.
 - 2) Note on desktop.
 - 3) Note on spreadsheet.
 - 4) Structure of HTML.
 - 5) Define tags in HTML.
 - 6) List out the elements of Windows.
3. A) Answer the following (**any two**) : **6**
- 1) Describe the term 'LAN'.
 - 2) Write the history of internet.
 - 3) Write short note on 'Program Manager'.
- B) Explain any four functions in MS-Excel with example. **4**
4. Answer the following (**any two**) : **10**
- 1) What is multiprocessing ? Explain with diagram.
 - 2) Write short note on Wordpad.
 - 3) Explain the terms MAN and WAN.
5. Answer the following (**any two**) : **10**
- 1) What is the use of table tag ? Explain with example.
 - 2) Write the difference between Javascript and VB Script.
 - 3) Explain different types of charts in MS-Excel.
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B.Sc. (ECS) (Part – I) (Semester – II) Examination, 2014
COMPUTER SCIENCE
Programming Using ‘C’ – II (Paper – II)

Day and Date : Monday, 3-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Total Marks : 50

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

1. Choose correct alternatives. 10

1) The memory required to store double type pointer is _____ bytes.

- a) 1 b) 2 c) 4 d) 8

2) The storage class _____ renames the existing data types.

- a) auto b) extern c) enum d) typedef

3) _____ allows modular programming.

- a) Variable b) Pointer c) Function d) Array

4) The expression *p++ is evaluated from _____

- a) right to left b) left to right
c) left to left d) right to right

5) The expression ++sp → z increments _____

- a) sp b) z c) both a) and b) d) none of these

6) calloc () function accepts _____ arguments.

- a) 0 b) 1 c) 2 d) 3

7) What will be the output of following ‘c’ code

```
int * p ;  
char q = 'A' ;  
p = & q ;  
printf ( "%c", * p);
```

- a) 65 b) A c) Error d) None of these



- 8) The _____ function used for reading binary stream.
a) read b) fread c) fscanf d) all of these
- 9) Pointer is variable.
a) True b) False
- 10) Static memory allocation is done at run time of program.
a) True b) False

2. Answer **any five** of the following : **10**
- 1) Define 'Pointer'. How it is initialized ?
 - 2) What are advantages of functions ?
 - 3) What is register variable ?
 - 4) Write the difference between structure variable and union variable.
 - 5) Define Binary and text file.
 - 6) Define "Dynamic memory allocation".
3. A) Answer **any two** of the following : **6**
- 1) Write the difference between array and structure.
 - 2) What is the purpose of ftell () ? Explain with example.
 - 3) How to destroy a dynamically allocated memory ?
- B) Write a program which shows the concept of arrays of structure. **4**
4. Answer **any two** of the following : **10**
- 1) Differentiate between pass by value and pass by pointer.
 - 2) Describe realloc () function with example.
 - 3) Write a program to find digit sum of input number by using recursion.
5. Answer **any two** of the following : **10**
- 1) How we can pass structure to the function ?
 - 2) Write a program for traversing an array elements by using pointer.
 - 3) What is file ? List out various file opening modes. Write difference between write and append mode.
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**B.Sc. (ECS) – I (Semester – II) Examination, 2014
ELECTRONICS (Paper – III)
Linear Electronics – II**

Day and Date : Wednesday, 5-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

- N. B. :** 1) *All questions are compulsory.*
2) *Figures to **right** indicate **full** marks.*
3) *Neat diagrams must be drawn **whenever** necessary.*

1. Choose correct alternative :

10

- 1) An op-amp can be classified as _____ amplifier.
a) Linear b) Low c) +ve feedback
- 2) To generate a signal greater than 1 MHz _____ oscillator are used.
a) Wien bridge b) Collpitt's c) PSO
- 3) The _____ current of JFET is partially zero.
a) Drain b) Source c) Gate
- 4) _____ amplifier are normally used to amplify the signal below 10 Hz.
a) DC b) RC coupling c) TC
- 5) At pinch-off voltage the drain current in FET _____
a) Start flow b) Is cut off c) Is maximum
- 6) In RC phase shift oscillator ladder network consists of _____ RC connections.
a) One b) Two c) Three
- 7) The conduction angle of class-B amplifier is _____ degree.
a) 180 b) 360 c) 90
- 8) An electronic oscillator is _____
a) Just like an alternator
b) Nothing but an amplifier
c) An amplifier with feedback

SLR-Q – 16



9) I/P impedance of ideal op-amp is _____

- a) Zero b) Infinity c) High

10) There is a phase _____ of input signal in CE amplifier.

- a) Reversal b) Versal c) Zero

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

- 1) Define amplifier. Give classification of amplifier according to coupling method.
- 2) Give difference between BJT and FET.
- 3) Draw transfer characteristics of class-A and class-B amplifier.
- 4) Explain Barkhausen criteria.
- 5) Give parameters of op-amp.
- 6) Explain inverting and non-inverting terminals of op-amp.

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

- 1) Explain single stage CE amplifier.
- 2) Explain virtual ground concept.
- 3) Write a note on wien-bridge oscillator.

B) Explain DE MOSFET. **4**

4. Attempt **any two** : **10**

- 1) Explain astable multivibrator using IC 555.
- 2) Explain RC coupled amplifier.
- 3) Explain construction and working of p-channel JFET.

5. Attempt **any two** : **10**

- 1) Explain phase shift oscillator.
 - 2) Explain op-amp as a integrator.
 - 3) Explain different types of amplifier according to frequency range.
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Seat No.	
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B.Sc. (ECS) – I (Semester – II) Examination, 2014
DIGITAL ELECTRONICS – II (Paper – IV)

Day and Date : Friday, 7-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

- Instructions :**
- All questions are **compulsory**.*
 - All questions carry **equal** marks.*
 - Draw neat diagram **wherever** necessary.*

1. Choose correct alternatives : 10

- In a positive edge triggered JK Flip Flop a $J = 1$, $K = 1$ produces the _____ state.
a) Race
b) Dead
c) Toggle
d) Constant
- _____ converter changes analog voltage to binary data.
a) A/D
b) D/A
c) Both
d) None
- D Flip Flop requires _____ inputs.
a) 1 b) 2 c) 3 d) 4
- For mod-5 counter _____ Flip Flops are used.
a) 2 b) 3 c) 4 d) 5
- A/D converter is usually considered as a _____.
a) Transistor
b) Decoder
c) Encoder
d) Counter
- A dynamic RAM consists of _____.
a) 4 transistor b) 4 capacitor
c) 1 transistor and 1 capacitor d) 2 transistor and 2 capacitor
- IC 7490 is a _____ IC.
a) Counter
b) Shift Register
c) Converter
d) None



- 8) _____ memory is a permanent memory.
a) RAM b) ROM c) Both d) None
- 9) Memory size is indicated in _____
a) GB b) KHz c) HB d) K cycles
- 10) JK Flip Flop will become D type Flip Flop if _____
a) J and K zero b) J and K one
c) J is connected to Q d) K is connected to inverted J

2. Attempt **any five** of the following : **10**
- 1) Explain parameters of memory.
 - 2) Give classification of memory.
 - 3) Give parameters of DAC.
 - 4) Explain T Flip Flop.
 - 5) Give application of ADC and DAC.
 - 6) Explain SISO shift Register.
3. A) Attempt **any two** of the following : **6**
- 1) Explain counter type ADC.
 - 2) Explain modulus 5 counter.
 - 3) Write a note on EPROM.
- B) Write a note on shift register. **4**
4. Attempt **any two** of the following : **10**
- 1) Explain with suitable diagram 3 bit synchronous counter.
 - 2) Explain concept of static memory.
 - 3) Write a note on R-2R ladder network.
5. Attempt **any two** of the following : **10**
- 1) Explain Dual Slope ADC.
 - 2) Write a note on diode matrix ROM.
 - 3) Explain RS Flip Flop using NAND gate.
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Seat No.	
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B.Sc. – I (E.C.S.) (Semester – II) Examination, 2014
MATHEMATICS
Algebra (Paper – V)

Day and Date : Saturday, 8-11-2014

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Choose correct alternative for each of the following : 10

- 1) A relation R on a set A is _____ if $(x, y) \in R$ and $(y, z) \in R \Rightarrow (x, z) \in R$.
- a) Antisymmetric b) Transitive
c) Symmetric d) Reflexive
- 2) A statement whose truth value changes according to circumstances is called _____
- a) Proposition b) Logical constant
c) Logical variable d) Simple statement
- 3) In the principle of mathematical induction $p(k)$ is true for all $k \geq 1$ is called _____
- a) Induction hypothesis b) Induction principle
c) Basis of induction d) Finite induction
- 4) The rule of simplification in logic is _____
- a) $p \vee q \vdash q$ b) $p \wedge q \vdash q$
c) $p \vdash p \vee q$ d) $q \vdash p \vee q$
- 5) Starting from the premises, the process of reaching the true conclusion is called _____
- a) Proof b) Indirect proof
c) Direct proof d) Conclusion



6) The quantifiers 'for every' or 'for all' is called _____ quantifier.

- a) Predicate
b) Existential
c) Uniformal
d) Universal

7) If $a * b = b * a = e, \forall a, b \in A$ the e is known as _____ element.

- a) Inverse
b) Converse
c) Identity
d) None of these

8) The complex conjugate of $(1 + i)(-2 + i)$ is _____

- a) $-3 - i$
b) $-3 + i$
c) $-2 + i$
d) $(1 - i)(-2 - i)$

9) A function f is said to be _____ if it is one-one and onto.

- a) Bisective
b) Injective
c) Surjective
d) Bijective

10) Every element of set A is related to one and only one element of the set B then such relation is known as _____ from the set A to set B .

- a) Mapping
b) Void relation
c) Universal relation
d) Empty relation

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

10

- 1) Define logical variables and constants.
- 2) Express the complex number $2 | (1 + i)$ in polar form.
- 3) Let $f: \mathbb{R} \rightarrow \mathbb{R}$ defined as $f(x) = \frac{(5 - 3x)}{4}$, show that f is onto.
- 4) Let $A = \{1, 2, 3, 4, 5\}$, let R be the relation defined on the set A as $R = \{(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (3, 4), (4, 3), (4, 5), (3, 5)\}$. Draw the diagraph of R .
- 5) Write the rule of importation and exportation in logic.
- 6) Define first principle of finite induction.



3. A) Attempt **any two** from the following : **6**

i) Find the value of a, if $f(x) = \frac{3ax + 5}{2}$ and $f(1) = 10$.

ii) If p and q are true statements, while r and s are false statements find the truth value of

$$p \wedge (q \vee r) \vee \sim [(p \wedge q) \wedge (r \vee s)].$$

iii) Let $z_1 = r_1 (\cos \theta_1 + i \sin \theta_1)$, $z_2 = r_2 (\cos \theta_2 + i \sin \theta_2)$ then show that $\arg. (z_1 \cdot z_2) = \arg z_1 + \arg z_2$.

B) Prepare the truth table for converse, inverse and contrapositive of a conditional statement. **4**

4. Attempt **any two** from the following : **10**

1) Prove that $\sqrt{5}$ is irrational.

2) Prove the following argument by using direct method.

$$p \Rightarrow r, q \Rightarrow s, p \vee q \vdash s \vee r$$

3) Let $R = \{(1, 3), (2, 1), (2, 4), (3, 3), (4, 1), (4, 2)\}$ be a relation on set $A = \{1, 2, 3, 4\}$. Find transitive closure of R by using Warshall's algorithm.

5. Attempt **any two** from the following : **10**

1) Let $f : \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \frac{5x - 4}{3}$ for all $x \in \mathbb{R}$, show that f is bijective.

2) Prove that by mathematical induction, $5^{2n} - 6n + 8$ is divisible by 9.

3) Write the distributive law in logic and prove by using truth table.



Seat No.	
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B.Sc. (ECS) – I (Semester – II) Examination, 2014
MATHEMATICS (Paper – VI)
Operations Research

Day and Date : Monday, 10-11-2014
Time : 11.00 a.m. to. 1.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative : 10

1) In the optimality test of the T.P. if all $d_{ij} > 0$ then the solution under test is

- _____
- a) optimum and unique
 - b) alternative optimum
 - c) not optimum
 - d) none of these

2) In case of maximization problem the coefficient of artificial variable in objective function is _____

- a) M
- b) -M
- c) R
- d) O

3) In graphical solution of L.P.P. if the intersection of the region given by lines does not exist then L.P.P. has _____ solution.

- a) Unbounded
- b) Bounded
- c) No
- d) Optimum

4) The transportation problem is a special type of _____

- a) Assignment problem
- b) L.P.P.
- c) Transportation problem
- d) None of these

5) In duality, if the constraints in one problem are of \geq type then the constraints in other problem are of _____ type.

- a) \geq
- b) \leq
- c) \leq or \geq
- d) =



- 6) _____ method is used to solve an assignment problem.
- a) Eulerian
b) Hamilton
c) Hungarian
d) None of these
- 7) In simplex method the element corresponding to entering variable and leaving variable is called _____ element.
- a) entering
b) leaving
c) pivot
d) none of these
- 8) The dual of dual L.P.P. is _____
- a) dual
b) primal
c) standard
d) none of these
- 9) _____ method is used to find optimum solution of a T.P.
- a) Northwest corner
b) Least coast
c) V.A.M.
d) MODI
- 10) If number of occupied cells is less than $m + n - 1$ then the solution is _____
- a) Degenerate
b) Non degenerate
c) Optimum
d) None of these

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

10

- 1) What is transportation problem ?
- 2) Define balanced and unbalanced A.P.
- 3) Give the methods of finding I.B.F.S. in T.P.
- 4) Write the standard form of following L.P.P.
 Maximize $Z = 5x_1 + 7x_2$
 Subject to $6x_1 + 5x_2 \leq 220$
 $10x_1 + 6x_2 \leq 320$
 $x_1, x_2 \geq 0$.
- 5) Define surplus variables in L.P.P.
- 6) Define alternate solution of A.P.



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

- 1) Explain canonical form of L.P.P. with suitable example.
- 2) Write dual of L.P.P.

$$\begin{aligned} \text{Max } Z &= 6x_1 + 11x_2 \\ \text{Subject to } 2x_1 + x_2 &\leq 104 \\ x_1 + 2x_2 &\leq 76 \\ x_1, x_2 &\geq 0 \end{aligned}$$

3) How A.P. of maximization type is converted into minimization type ?

B) Write the difference between A.P. and T.P. **4**

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

1) Find I.B.F.S. of the following T.P. by least-cost method.

	Q	R	S	T	a_i
A	6	5	8	5	30
B	5	11	9	7	40
C	8	9	7	13	50
b_j	35	28	32	25	120

2) Solve the following A.P.

	A	B	C	D
1	10	25	15	20
2	15	30	05	15
3	35	20	12	24
4	17	25	24	20

3) Solve the following L.P.P. by simplex method.

$$\begin{aligned} \text{Maximize } Z &= 2x + 4y \\ \text{Subject to, } x + 2y &\leq 5 \\ x + y &\leq 4 \\ x, y, &\geq 0. \end{aligned}$$



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

10

1) Solve the following L.P.P. by using graphical method.

Maximize $Z = 24x + 8y$

Subject to $2x + 5y \leq 40$

$4x + y \leq 20$

$10x + 5y \leq 60$

$x, y \geq 0.$

2) Find optimum solution of the following I.B.F.S. of T.P. by using MODI method.

	D_1	D_2	D_3	a_i
01	13 (9)	15 (8)	16	17
02	7 (5)	11	2 (7)	12
03	19	20	9 (16)	16
b_j	14	8	23	45

3) Solve the following A.P. for maximize the profit.

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



Seat No.	
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**B.Sc. (E.C.S.) – I (Semester – I) (CGPA Pattern) Examination, 2014
COMPUTER FUNDAMENTALS AND PROGRAMMING USING C – I
(Paper – II)**

Day and Date : Monday, 3-11-2014
Time : 3.00 p.m. to 6.00 p.m.

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

1. Multiple choice questions :

5

- i) Magnetic tape is _____ storage device.
a) Sequentially accessed b) Random
c) Track d) None of these
- ii) _____ is open source operating system.
a) Windows b) Unix
c) Both a) and b) d) None of these
- iii) $3\frac{1}{2}$ zip disk can store _____ data and information.
a) 2 mb b) 100 mb
c) 5 mb d) 9 mb
- iv) _____ is not used for system performance.
a) Speed b) Throughput
c) Turn around time d) Response time
- v) _____ is the extension of batch file.
a) .txt b) .XML
c) .bat d) .batch



2. Answer **any five** of the following : 10
- i) Explain the difference between RAM and ROM.
 - ii) Draw the block diagram of computer.
 - iii) Define terms : a) Hardware b) Software.
 - iv) Explain VDU.
 - v) Give long form of :
 - a) EPROM
 - b) MICR.
 - vi) Explain characteristics of computer.
 - vii) Give the list of types of computer.
3. A) Write short notes on **any two** of the following : 10
- i) Explain operating system with its functions.
 - ii) Explain input devices in detail.
 - iii) Explain computer languages.
- B) Answer **any one** of the following : 10
- i) Explain generation of computer.
 - ii) Explain computer codes in detail

SECTION – II

1. Multiple choice questions : 5
- i) _____ is empty data type.
 - a) Null
 - b) Empty
 - c) Void
 - d) None
 - ii) Void main ()
{
char name = 's' ;
printf ("%d", size of (name));
}
What is the output ?
 - a) s
 - b) 1
 - c) error
 - d) 2
 - iii) Array index in C always start at
 - a) -1
 - b) 1
 - c) 0
 - d) 2



- iv) An _____ is a set of instructions for accomplishing a task.
- a) Flowchart
 - b) Algorithm
 - c) Array
 - d) None
- v) _____ only adds new name to some existing type.
- a) Typedef
 - b) Enum
 - c) Array
 - d) None

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

10

- i) Where was C developed by whom ?
- ii) There is no difference between 'A' and "A" comment on it.
- iii) What is the syntax of ternary operator ?
- iv) What is the difference between if and switch case statement ?
- v) Why header file used in C language ?
- vi) How variable is declared and initialized ?
- vii) Define : a) Identifier b) Keyword.

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

10

- i) What is flowchart ? Explain symbols used in flowchart.
- ii) Explain unconditional control statements with example.
- iii) Write a program to calculate multiplication of matrix.

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

10

- i) What is operator ? Explain types of operator in detail.
 - ii) Write a program to find out perfect number between 1 to 1000.
-



Seat No.	
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B.Sc. – (E.C.S.) (Part – I) (Semester – II) Examination, 2014
STATISTICS (Paper – VII)
Descriptive Statistics – II

Day and Date : Tuesday, 11-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

- Instructions:** 1) **All questions are compulsory.**
2) **All questions carry equal marks.**
3) **Use of any type of calculator is allowed.**
4) **Figures to right indicate full marks.**
5) **Graph paper will be supplied on request.**

1. Choose most correct alternative. 10
- 1) If the correlation between X and Y is 0.35 then correlation between 3X and 3Y is
a) zero b) 1 c) 0.35 d) none of these
 - 2) The correlation between marks and intelligence quotient is
a) negative correlation b) positive correlation
c) no correlation d) none of these
 - 3) The regression equations X on Y and Y on X are $3X - Y = 5$ and $4X - 3Y = 0$ respectively, then A. M. of Y is
a) 3 b) 4 c) 3.5 d) none of these
 - 4) Regression is a method of estimating value of one variable for known value of other variable, if the variable are
a) positively correlated only b) negatively correlated only
c) perfect positively correlated only d) correlated only
 - 5) Multiple correlation coefficient is
a) non-negative and less than or equal to unity
b) non-negative and greater than unity
c) non-negative and equal to unity
d) none of these



6) According to Yule's notation $b_{23.1}$ is partial regression coefficient in which

- a) X_1 is dependent variable b) X_2 is dependent variable
c) X_3 is dependent variable d) None of these

7) The time series data is arranged

- a) geographically b) qualitatively
c) chronologically d) quantitatively

8) Random variations are also called as

- a) seasonal variation b) irregular variation
c) regular variation d) none of these

9) If $\sum P_1 = 144$, $\sum P_0 = 125$, $\sum \left(\frac{P_1}{P_0} \right) \times 100 = 1.5247$ then Laspeyre's price

index number is

- a) 115.2 b) 86.68
c) 152.47 d) cannot be determined

10) Price Index No. of a certain group of commodities is 125, it means that

- a) price increased by 25% b) price increased by Rs. 25
c) price decreased by 25% d) price decreased by Rs. 25

2. Attempt **any five** :

10

1) Define Spearman's Rank correlation coefficient.

2) Given : $n = 10$, $\sum (X - \bar{X})(Y - \bar{Y}) = -55$, $\sigma_x = 3$, $\sigma_y = 5$, find correlation coefficient.

3) If $b_{yx} = 0.4$, $r = 0.5$ and $\sigma_y = 4$, find the value of S. D. of X.

4) If $r_{12} = 0.6$, $r_{13} = r_{23} = 0.4$, then find $r_{12.3}$.

5) What are the uses of time series ?

6) If $\sum p_1 q_1 = 1340$, $\sum p_0 q_1 = 1070$, $\sum p_1 q_0 = 2070$; find Paasche's price index number.



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

- 1) Explain the concept of regression.
- 2) Construct price index number by simple average of relative method.

Commodity :	A	B	C
P ₁ :	5.20	3.75	1.95
P ₀ :	4.25	2.95	2.15

- 3) The equations of lines of regression are $6y = 5x + 90$ and $15x = 8y + 130$, find correlation coefficient between x and y.

B) If X₁, X₂, X₃ are 3 variables measured from their respective means, obtain equation of plane of regression of X₁ on X₂ and X₃ from the following information. 4

$\sigma_1 = 3.5 \quad \sigma_2 = 3.7 \quad \sigma_3 = 3.6$
 $r_{12} = 0.25 \quad r_{13} = 0.35 \quad r_{23} = 0.28$

4. Attempt **any two** : 10

- 1) Explain selection of commodities in construction of index number.
- 2) Find 3-yearly moving averages for following data :

Year :	1	2	3	4	5	6	7	8
Sale :	18	22	24	27	35	30	24	20

- 3) Find Fisher's price index number from the following data :

Commodity	Base Year		Current Year	
	Price	Qty.	Price	Qty.
A	12	5	14	3
B	14	4	15	5
C	10	6	12	4

5. Attempt **any two** : 10

- 1) Find Karl Pearson's correlation coefficient between X and Y.

X :	20	25	30	15	12
Y :	18	20	40	13	10

- 2) Write a note on secular trend.
 - 3) Distinguish between multiple correlation and partial correlation in case of trivariate data.
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Seat No.	
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**B.Sc. (ECS) (Part – I) (Semester – II) Examination, 2014
STATISTICS (Paper – VIII)
Probability Theory – II**

Day and Date : Wednesday, 12-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose most correct alternative : 10

- 1) If calculated value of test statistic lies in critical region, then _____
 - a) H_0 is accepted
 - b) H_0 is rejected
 - c) H_1 is rejected
 - d) None of these

- 2) Test statistic is _____
 - a) A function of sample observations
 - b) Used to test null hypothesis
 - c) a) and b) both
 - d) None of these

- 3) If $P(X = x, Y = y)$ is joint p.m.f. of Bivariate r.v. (X, Y) then $\sum_x P(X = x, Y = y) =$ _____
 - a) $P(Y = y)$
 - b) $P(X = x)$
 - c) 1
 - d) None of these

- 4) If joint p.m.f. of (X, Y) is $P(x, y) = \begin{cases} 1/9, & x = 0, 1, 2, y = 1, 2, 3 \\ 0, & \text{otherwise} \end{cases}$

then $P(X = 3, Y = 3) =$ _____

 - a) $1/9$
 - b) $3/9$
 - c) 1
 - d) Zero

- 5) If a continuous r.v. X has p.d.f. $f(x)$, then $E(X) =$ _____
 - a) $\int_{-\infty}^{\infty} xf(x) dx$
 - b) $\sum_x xf(x)$
 - c) $\int_{-\infty}^{\infty} f(x) dx$
 - d) None of these



6) If p.d.f. of r.v. X is $f(x) = 1, 0 \leq x \leq 1$, then $P(X = 0.5) =$ _____
 a) 0.5 b) 0.6 c) Zero d) None of these

7) Let X be a continuous r.v. with $E(X) = 5$, then $E\left(\frac{3 - X}{5}\right) =$ _____

a) $-\frac{2}{4}$ b) $\frac{2}{4}$ c) Zero d) None of these

8) Normal distribution is symmetric about _____

a) A.M. b) Median c) Mode d) All of these

9) If $X \rightarrow U(2, 4)$, then $P(X < 3) =$ _____

a) 0.5 b) 0.6 c) 0.4 d) 0.3

10) Let $X \rightarrow N(10, 4)$, $Y \rightarrow N(5, 9)$ be two independent r.v.s., then $V(X - Y) =$

_____ a) 5 b) -5 c) 13 d) None of these

2. Attempt **any five** :

10

- 1) Define joint p.m.f.
- 2) Define Null hypothesis and alternative hypothesis.
- 3) Define variance of continuous r.v. X .
- 4) Let X and Y be two independent normal variates with parameters (4, 9) and (6, 16) respectively. State probability distribution of $2X + Y$.
- 5) Let $X \rightarrow U(3, 5)$, find $P(X > 4.15)$.
- 6) The p.d.f. of r.v. X is $f(x) = kx, 4 \leq X \leq 5$. Find value of k .

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

6

1) The joint p.m.f. of (X, Y) is as follows.

$$P(x, y) = k(2x + 3y), x = 1, 2, y = 0, 2.$$

Find value of k , hence $P(X = 2, Y = 2)$.

2) The p.d.f. of r.v. X is as follows :

$$f(x) = \begin{cases} 6x(1-x), & 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$$

Find $E(X)$.

3) Define Normal distribution. State additive property of it.

B) Given $n = 100, \bar{X} = 27, \sigma = 8, \mu_0 = 30$ test $H_0 : \mu = \mu_0$ against $H_1 : \mu \neq \mu_0$ at 5% level of significance.

4



4. Attempt **any two** :

10

- 1) Write the procedure of testing equality of two population proportions.
- 2) A random variable X has normal distribution with mean 5 and S.D. 4. Find $P(13 < X < 17)$. (Given : $P(Z > 1) = 0.1587$ where Z is 8 NV).
- 3) The c.d.f. of continuous r.v. X is

$$F(x) = \begin{cases} 0, & x < -1 \\ \frac{x+1}{2}, & -1 \leq x < 1 \\ 1, & x \geq 1 \end{cases}$$

Find :

- i) $P(-0.5 < X < 0.4)$
- ii) p.d.f. of X.

5. Attempt **any two** :

10

- 1) Find mean and variance of continuous uniform distribution.
- 2) The joint p.m.f. of (X, Y) is :

X \ Y	1	3	9
2	$\frac{3}{24}$	$\frac{1}{24}$	$\frac{2}{24}$
4	$\frac{6}{24}$	$\frac{6}{24}$	0
6	$\frac{3}{24}$	$\frac{1}{24}$	$\frac{2}{24}$

Find $E(X)$, $E(Y)$, $P(X = 4 | Y = 3)$

- 3) Life time of certain type of computer has exponential distribution with mean life time 360 days. What is probability that the computer will operate for more than 72 days.
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Seat No.	
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B.Sc. (ECS) – II (Semester – III) Examination, 2014
COMPUTER SCIENCE (Paper – I)
Operating System – I

Day and Date : Friday, 21-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative : 10
- 1) A _____ system guarantees that critical tasks be completed on time.
 - a) hard real-time
 - b) soft real-time
 - c) symmetric multiprocessing
 - d) asymmetric multiprocessing
 - 2) _____ increases CPU utilization by organizing jobs. So that, the CPU always has one to execute.
 - a) Distributed system
 - b) Real-time system
 - c) Time-sharing
 - d) Multi-programming
 - 3) _____ is any mechanism for controlling the access of programs, processors or users to the resources defined by a computer system.
 - a) Protection
 - b) Networking
 - c) Command-interpreter
 - d) Disk-scheduling
 - 4) _____ is use in the communication between a web server and a web browser.
 - a) HTTP
 - b) NFS
 - c) FTP
 - d) All of these
 - 5) _____ indicates the address of the next instruction to be executed for process.
 - a) CPU register
 - b) Program counter
 - c) Process state
 - d) Accounting information



3. A) Solve **any two** of the following : **6**
- 1) What are the goal of an operating system ? Explain.
 - 2) Define thread. Also differentiate between preemptive and non-preemptive scheduling.
 - 3) What is the purpose of protection system ?
- B) What is the main advantage of an operating system designer of using a virtual-machine architecture ? What is the main advantage for a user ? **4**
4. Solve **any two** of the following : **10**
- 1) Explain the operations on processes.
 - 2) What are two differences between user-level threads and Kernel-level threads ? Under what circumstances is one type better than the other ?
 - 3) Explain multilevel queue scheduling with example.
5. Solve **any two** of the following : **10**
- 1) Using Semaphore explain the following :
 - a) Deadlock and starvation
 - b) Binary semaphore.
 - 2) Define the essential properties of the following types of operating systems :
 - a) Multiprogramming
 - b) Distributed.
 - 3) Explain the following terms :
 - a) Synchronization
 - b) Buffering.
-



Seat No.	
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B.Sc. (ECS) – II (Semester – III) Examination, 2014
OBJECT ORIENTED PROGRAMMING USING C++ – I (Paper – II)

Day and Date : Saturday, 22-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives : 10

- 1) Which of the following is not type of constructor ?
 - a) Copy constructor
 - b) Friend constructor
 - c) Default constructor
 - d) Parameterized constructor
- 2) Which one of the following is not advantage of functions ?
 - a) Debugging is easier
 - b) Testing is easier
 - c) Recursive call is easier
 - d) It consumes low disk space
- 3) What is the result of the following statement :
x = 10 ;
y = ++ x ;
 - a) x = 10, y = 10
 - b) x = 10, y = 11
 - c) x = 11, y = 10
 - d) x = 11, y = 11
- 4) To use the function tolower (), which of the following header file should include ?
 - a) string.h
 - b) conio.h
 - c) ctype.h
 - d) Don't need any header file



3. A) Answer **any two** of the following : **6**
- 1) Explain function prototyping in detail.
 - 2) What are the rules of operator overloading ?
 - 3) What are the applications of OOP ?
- B) Define copy constructor with appropriate example. **4**
4. Answer **any two** of the following : **10**
- 1) Explain the features of object oriented programming.
 - 2) Why C++ is not pure object oriented programming language ? Prove it with suitable example.
 - 3) Explain dynamic initialization of object.
5. Answer **any two** of the following : **10**
- 1) What are the datatypes in C++ ?
 - 2) Write a program in C++ to implement any one binary operator overloading with member function.
 - 3) Explain various types of constructors used in C++.
-



Seat No.	
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B.Sc. (ECS) – II (Semester – III) Examination, 2014
COMPUTER SCIENCE (Paper – III)
Data Structures and Algorithms – I

Day and Date : Monday, 24-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives : 10

- 1) The open end of the stack is called the _____
 - a) top of the stack
 - b) head of the stack
 - c) bottom of the stack
 - d) tail of the stack
- 2) Queue is a _____ list.
 - a) LIFO
 - b) LILO
 - c) FILO
 - d) FIFO
- 3) Which of the following data structure is a linear type ?
 - a) Array
 - b) Stack
 - c) Linked List
 - d) All of these
- 4) The prefix of $(A + B) * (C - D)$ is _____
 - a) $*+ - ABCD$
 - b) $*+ AB - CD$
 - c) $+ * AB - CD$
 - d) $* - AB + CD$
- 5) The minimum number of fields with each node of doubly linked list is _____
 - a) 1
 - b) 2
 - c) 3
 - d) 4



- 6) Linked list are best suited _____
- a) for relatively permanent collections of data
 - b) for the size of structure and data in the structure are constantly changing
 - c) both a) and b)
 - d) none of these
- 7) Which of the following data structure is used to implement recursion ?
- a) Stack
 - b) Queue
 - c) Array
 - d) Linked list
- 8) The function top () removes the value at the top of a stack.
- a) True
 - b) False
- 9) The memory of array depends on _____
- a) Type of array
 - b) Number of elements
 - c) Both a) and b)
 - d) None of these
- 10) The dynamically allocated memory is released automatically.
- a) True
 - b) False

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

10

- 1) Define data structure.
- 2) What is self referential structure ?
- 3) What is doubly linked list ? Give its advantages.
- 4) What is Deque ?
- 5) Give the disadvantages of linked list.
- 6) What is recursion ?



3. A) Answer **any two** of the following : **6**
- 1) Explain Greedy algorithm.
 - 2) What is stack ? Explain with suitable example.
 - 3) Explain the concept of circular linked list.
- B) Write note on Big O notation. **4**
4. Answer **any two** of the following : **10**
- 1) Explain the term
 - a) malloc ()
 - b) realloc ()
 - c) free ()
 - 2) Write a program to implement queue using array.
 - 3) Explain doubly linked list with its advantages.
5. Answer **any two** of the following : **10**
- 1) Explain the concept of circular queue.
 - 2) Write a program to reverse a string using stack.
 - 3) What is array ? Explain two-dimensional array with example.
-



Seat No.	
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B.Sc. (E.C.S.) – II (Semester – III) Examination, 2014
COMPUTER SCIENCE (Paper – IV)
Software Engineering

Day and Date : Tuesday, 25-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative :

10

- 1) Good design prevents data entry errors by _____
 - a) Plenty of space provided for entry
 - b) Colour codes
 - c) Instructing to fill up the form
 - d) Minimising key strokes
- 2) Your college admission form is _____ type of response.
 - a) Open
 - b) Closed
 - c) Interactive
 - d) All
- 3) _____ is a function of number of failures experienced by a particular user of software.
 - a) Usability
 - b) Reliability
 - c) Performance
 - d) None
- 4) Spiral model is developed by _____
 - a) Roger Pressman
 - b) Berry Bohem
 - c) Victor Bisil
 - d) Bev Little Wood
- 5) Prototyping model begin with _____
 - a) Testing
 - b) Analysis
 - c) Coding
 - d) Designing
- 6) Program is _____
 - a) Module of s/w
 - b) Subset
 - c) Superset
 - d) All
- 7) _____ is not the element of system.
 - a) Input
 - b) Interface
 - c) Material
 - d) Processors



- 8) Decision table is a combination of _____
- a) Slubs and drivers
 - b) Stubs and conditions
 - c) Input and output
 - d) Conditions and actions
- 9) Waterfall model is _____ model.
- a) Iteractive
 - b) Interactive
 - c) Linear
 - d) Rapid
- 10) Enhancement of the project is done during _____ of SDLC.
- a) Maintenance
 - b) Development
 - c) Designing
 - d) Problem identification

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

10

- 1) Define software engineering.
- 2) Write the characteristics of a system.
- 3) Explain requirement specification.
- 4) Write the skills required in system analyst.
- 5) Explain the need of decision table.
- 6) What is software coding ?

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

6

- 1) Explain the need of feasibility study.
- 2) Explain the role of feedback in a system with example.
- 3) Explain the characteristics of structured flowchart.

B) Compare different interviewing techniques.

4

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

10

- 1) Explain the steps in prototyping.
- 2) Explain various types of systems.
- 3) Explain the role of system analyst in software development.

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

10

- 1) Explain the importance of system analysis in software development.
 - 2) How super market will be beneficial by using computerised billing system ?
 - 3) Write a note on documenting decisions.
-



Seat No.	
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**B.Sc. (ECS) – II (Semester – III) Examination, 2014
ORGANIZATION OF PC – I (Paper – V)**

Day and Date : Wednesday, 26-11-2014
Time :3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Fill in the blanks with correct alternative and rewrite : 10
- 1) The instruction fetched from memory is transfer to _____
a) CU b) ALU c) IR d) CPU
 - 2) In _____ data transfer mode the CPU is not incharge for data transfer.
a) DMA b) Programmed I/O
c) Interrupt driven I/O d) None
 - 3) _____ techniques allow detection of multiple bit failures.
a) Parity bit b) Hamming code
c) CRC d) Both a and b
 - 4) The common method of scanning is called _____
a) Vertical scan b) Horizontal scan
c) Raster scan d) Vector scan
 - 5) OPC stands for in laser printer is _____
a) Organization of PC b) Organic Photoconductive Device
c) Organic Photovoltaic Drum d) None
 - 6) The _____ printer is operates much like a Xerox machine.
a) Laser b) Dot matrix c) Inkjet d) Thermal
 - 7) The dot matrix printer is _____ printer.
a) Non-impact printer b) Impact printer
c) NLQ d) LQ



8) The _____ uses an advanced up such as 80286, 80386, 80486 and pentium etc.

- a) PC b) PC-XT c) PC-AT d) PC-NT

9) _____ converts ac voltage in different dc O/P's.

- a) Inverter b) PC c) UPS d) SMPS

10) 8088 has 20 bit address bus and it can address upto _____ locations.

- a) 1 MB b) 2 MB c) 64 KB d) 32 KB

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

- 1) Write function of modem.
- 2) Define impact printer and non-impact printer.
- 3) What is use of spindle motor and stepper motor in hard disk drive ?
- 4) Draw a block diagram of CRT.
- 5) List names in memory hierarchy.
- 6) Write three phases of instruction cycle in brief.

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

- 1) Explain different control signals used in PC's.
- 2) Explain briefly dot matrix printer.
- 3) Compare PC and PC-AT.

B) Explain concept of virtual memory. **4**

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

- 1) Explain Cache memory.
- 2) Explain block diagram of CRT monitor.
- 3) Define PC family. Explain OG PC family in details.

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

- 1) Explain MFM recording format used in magnetic disk.
 - 2) Write short note on CD-ROM.
 - 3) Explain block diagram of ALU and control unit.
-



Seat No.	
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**B.Sc. (ECS) – II (Semester – III) Examination, 2014
MICROPROCESSOR – I (Paper – VI)**

Day and Date : Thursday, 27-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives :

10

- 1) SP is used to point _____
a) BOS b) TOS c) Location d) Byte
- 2) Memory capacity of 8086 is _____
a) 1 Mb b) 512 Kb c) 1 Kb d) 64 Kb
- 3) Static RAM consists of _____ to store binary information.
a) Register b) Induction c) Flip flop d) Capacitor
- 4) Instruction set of 8086 includes _____ instruction.
a) 77 b) 133 c) 130 d) 131
- 5) Program counter stores address of _____ instruction.
a) Next b) Last c) Current d) None of these
- 6) I/O space in 8086 is _____
a) 1 kb b) 64 kb c) 128 kb d) 256 kb
- 7) Polling is a _____ for identifying the priority of interrupt.
a) Hardware b) I/O device c) Processor d) Software
- 8) Data stored on magnetic tape in _____ tracks.
a) Longitudinal b) Semicircular c) Spiral d) Circular
- 9) 8086 has _____ bit data bus.
a) 32 b) 8 c) 16 d) 20
- 10) SETC is _____ instruction.
a) Logical b) Data transfer
c) Program control d) Shift

P.T.O.

SLR-Q – 27



2. Attempt **any five** of the following : **10**
- 1) Explain features of 8086.
 - 2) Explain instruction format.
 - 3) Explain memory mapping.
 - 4) Explain combinational ALU's.
 - 5) Explain relative addressing mode.
 - 6) Explain associative memory.
3. A) Attempt **any two** of the following : **6**
- 1) Explain two and three address instruction.
 - 2) Explain memory hierarchy.
 - 3) Explain EU of 8086.
- B) Explain synchronous communication. **4**
4. Attempt **any two** of the following : **10**
- 1) Explain intel 8089 IOP.
 - 2) Explain memory segmentation.
 - 3) Explain pin function of 8086.
5. Attempt **any two** of the following : **10**
- 1) Explain memory management concept.
 - 2) Explain general register organization.
 - 3) Explain strobe method of data transfer.
-



Seat No.	
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B.Sc. (ECS) – II (Semester – III) Examination, 2014
ENGLISH – I (Compulsory) (Paper – VII)
English for Communication

Day and Date : Friday, 28-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. A) Fill in the blanks in the following sentences by choosing the correct alternatives : **6**
- 1) The birds migrate to _____
 - a) fly in the sky
 - b) enjoy and see the world
 - c) reproduce and find food for their young
 - d) see the fields
 - 2) Dr. Caswell's suggestion to his patient was _____
 - a) to take more exercise
 - b) to eat more and have more automobile rides
 - c) to take more interest in business activities
 - d) to take up art
 - 3) The word 'throwaway culture' suggests a society which likes _____
 - a) to waste things
 - b) to save things
 - c) to buy things
 - d) to accumulate things
 - 4) Yashwant Rao, in Jejuri, is a god worth seeing
 - a) Yes
 - b) No
 - c) None of the above



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

4

- 1) Represent the information given below in a bar diagram. Percentage of Fail Students in subjects :

Subjects	2010-11	2011-12	2012-13
Maths	52%	48%	37%
Physics	60%	52%	43%
Stats	50%	47%	33%
English	28%	19%	10%
Geography	40%	31%	29%

- 2) Expand the following notes into Coherent passage. Give them suitable title also :

- A) Proper Food : Lions and tigers : Flesh elephants : Hay and green leaves birds : insects etc.
- B) Healthy environment : Clean cages, sunlight and fresh air, bushes and rocks, trees etc.
- C) Medical treatment : Veterinary doctor – daily visits checking sick animals, their food

- 3) Given below are some points on how to light a stove. Write a paragraph on how to light a stove with the help of the following points :

- filling the stove with kerosene
- tightening the screw on the tank
- pumping up.
- lighting the burner loosening the screw on the tank
- allow the burner to heat
- tightening the screw again
- using a stove-pin to clean the hole of the burner
- lighting the stove again



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

10

1) Answer the questions given below the passage and make a summary of the passage :

A man or woman makes direct contact with society in two ways : as a member of some familial, professional or religious group, or as a member of a crowd. Groups are capable of being as moral and intelligent as the individuals who form them ; a crowd is chaotic, has no purpose of its own and is capable of anything except intelligent action and realistic thinking. Assembled in a crowd, people lose their powers of reasoning and their capacity for moral choice. Their suggestibility is increased to the point where they cease to have any judgement or will of their own. They become very excitable, they lose all sense of individual or collective responsibility, they are subject to sudden excesses of rage, enthusiasm and panic. In a word, a man in a crowd behaves as though he had swallowed a large dose of some powerful intoxicant.

He is a victim of what I have called 'herd poisoning'. Like alcohol, herd-poison is an active, extravagant drug. The crowd – intoxicated individual escapes from responsibility, intelligence and morality into a kind of frantic, animal mindlessness.

- 1) How does a man or a woman make direct contact with society ?
- 2) What is the difference between groups of people and crowd ?
- 3) What happens in a crowd ?
- 4) What does man feel when he becomes part of a crowd ?
- 5) What is 'herd poisoning' ?

2) Write a paragraph about your successful and unsuccessful experiment in the laboratory. (Maths, Electronic, Computer etc.)

5. Describe a paragraph of about 20 lines how you have taken the admission of your younger brother for 12th Standard in S. P. College Pune.

10



Seat No.	
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**B.Sc. (ECS) – II (Semester – IV) Examination, 2014
OPERATING SYSTEMS – II (Paper – I)**

Day and Date : Thursday, 13-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

1. Multiple choice questions :

10

- 1) The mechanism that bring a page into memory only when it is needed is called _____
 - a) Segmentation
 - b) Fragmentation
 - c) Demand Paging
 - d) Page replacement
- 2) UNIX shell is a _____
 - a) Hardware component
 - b) Command Interpreter
 - c) Part in compiler
 - d) Tool in CPU scheduling
- 3) Which directory implementation is used in most operating system ?
 - a) Single Level Directory Structure
 - b) Two Level Directory Structure
 - c) Tree Directory Structure
 - d) Acyclic directory structure
- 4) The Banker's Algorithm is used _____
 - a) To prevent deadlock in operating systems
 - b) To detect deadlock in operating systems
 - c) To change the deadlocked state
 - d) None of the above



3. A) Answer **any two** of the following : **6**
- 1) Write a note on paging.
 - 2) What are the operations performed on files ?
 - 3) Explain context of a process in UNIX.
- B) Explain FIFO page replacement algorithm with suitable example. **4**
4. Answer **any two** of the following : **10**
- 1) Explain process states and transitions in detail.
 - 2) What are page faults ? When do they occur ? Explain the concept of page replacement in brief.
 - 3) Explain types of directory structures.
5. Answer **any two** of the following : **10**
- 1) Explain File System Layout in detail.
 - 2) Write a note of deadlock avoidance.
 - 3) Explain structure of Buffer Header and Buffer Pool.
-



Seat No.	
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B.Sc. (ECS) – I (Semester – I) Examination, 2014
(CGPA Pattern)
ELECTRONICS (Paper – III)
Linear and Digital Electronics – I

Day and Date : Wednesday, 5-11-2014
Time : 3.00 p.m. to 6.00 p.m.

Max. Marks : 70

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

SECTION – I

1. Multiple choice questions :

5

- i) _____ is a one of the following passive component.
 - a) Resistor
 - b) Transistor
 - c) Vacuum triode
 - d) Tunnel diode
- ii) A resistor of $47 \text{ k}\Omega$ with $\pm 10\%$ tolerance has a color band sequence.
 - a) Yellow, violet, orange and silver
 - b) Yellow, violet, orange and gold
 - c) Yellow, violet, brown and silver
 - d) Yellow, violet, black and gold
- iii) Semiconductor have _____ temperature coefficient of resistance.
 - a) Positive
 - b) Negative
 - c) Zero
 - d) Both a) and b)
- iv) Emitter-base junction of transistor is always _____.
 - a) forward biased
 - b) reverse biased
 - c) zero biased
 - d) none



- v) The base region of transistor is thin and _____
- a) heavily doped
 - b) lightly doped
 - c) metallic
 - d) moderate doped

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

10

- i) Draw energy band diagram of conductor, insulator and semiconductor.
- ii) Explain terms :
 - i) barrier potential
 - ii) knee voltage.
- iii) What is active components and passive components ?
- iv) What is inductor ? What is inductance ?
- v) State Kirchhoff's laws.
- vi) Draw symbol of :
 - a) P-N junction diode
 - b) Zener diode
 - c) LED and
 - d) Photodiode.
- vii) What is 78XX and 79XX series in IC ?

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

10

- i) What is resistor ? Explain types of resistor.
- ii) Explain N-type semiconductor.
- iii) State and explain Thevenin's theorem.

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

10

- i) What is rectifier ? Explain half wave and full wave rectifier.
- ii) Explain construction and working of N-P-N transistor.



SECTION – II

1. Multiple choice questions :

5

- i) ASCII is a _____ bit binary code.
 - a) 8
 - b) 7
 - c) 128
 - d) 16
- ii) EX-OR gate has a high output when it has _____ number of high inputs.
 - a) even
 - b) odd
 - c) only one
 - d) none of above
- iii) A Half adder can be constructed from _____
 - a) two EX-OR gate
 - b) one EX-OR gate and one OR gate
 - c) one EX-OR gate and one AND gate
 - d) one EX-OR gate and NAND gate
- iv) _____ is a circuit with one input and many output.
 - a) Multiplexer
 - b) Demultiplexer
 - c) Decoder
 - d) Encoder
- v) The BCD equivalent of decimal 39 is _____
 - a) 100111
 - b) 0011 1001
 - c) 111001
 - d) 1010 1100

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

10

- i) Define Excess-3 Code and find Excess-3 code of 101 ?
- ii) Perform :
 - 1) $(7AE)_{16} = ()_2$
 - 2) $(95)_{10} = ()_{BCD}$.
- iii) Convert $(43.65)_{10}$ into binary.
- iv) State De-Morgan's theorem and prove them.
- v) Explain the working of half adder.
- vi) Draw OR Gate using NAND gate.
- vii) Draw diagram 2 : 1 multiplexer with Truth table.



3. A) Write short notes on **any two** of the following : **10**
- i) Explain octal to binary encoder with suitable diagram.
 - ii) Execute the following conversion.
 - a) $(1993)_{10} = (?)_8$
 - b) $(3711)_8 = (?)_{16}$
 - c) $(7 \subset 9)_{16} = (?)_{10}$
 - d) $(256)_{10} = (?)_{16}$
 - e) $(1111101)_2 = (?)_{10}$
 - iii) Prove the following identities using Boolean laws :
 - a) $(A + B)(A + C) = A + BC$
 - b) $ABC + A\bar{B}C + AB\bar{C} = A(B + C)$.
- B) Answer **any one** of the following : **10**
- i) Explain the universal gates and draw :
 - a) AND
 - b) OR
 - c) NOR
 - d) XOR
 - e) EX-OR using NAND gate.
 - ii) Explain weighted and unweighted code.
-



Seat No.	
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B.Sc. (ECS) – II (Semester – IV) Examination, 2014
OBJECT ORIENTED PROGRAMMING USING C++ – II (Paper – II)

Day and Date : Friday, 14-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives : **(1×10=10)**

1) The mechanism of creating new classes from existing class is called as

- a) Polymorphism
- b) Inheritance
- c) Nested class
- d) None of these

2) Stream is the sequence of _____ and serves as a source and destination for an I/O data.

- a) Bytes
- b) Words
- c) Kilobytes
- d) None of these

3) Set precision used to set the precision in which a float or _____ is displayed.

- a) Float
- b) Integer
- c) Character
- d) Double

4) The following which stream supports input operations.

- a) fstream buf
- b) filebuf
- c) fbuf
- d) ifstream

5) The following which function is used to check the current position of an input stream ?

- a) tellg()
- b) tellp()
- c) get()
- d) put()



- 6) 'this' pointer is not accessible for _____
- a) Constructor member function b) Static member function
c) Inline member function d) None of these

- 7) The cin and cout is nothing but _____
- a) Console unit b) File unit
c) System defined function d) Operator

- 8) _____ is delete the contents of the file if it exists.
- a) ios :: out b) ios :: in
c) ios :: binary d) ios :: trunc

- 9) Which one is not exception handling construct ?
- a) try b) throw
c) catch d) set-terminate()

- 10) Which of the following file mode parameter is used for 90 to end of file at opening time.
- a) ios :: ate b) ios :: out
c) ios :: in d) ios :: trunc

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

(5×2=10)

- 1) What is mean by inheritance in C++ ?
- 2) What is stream in C++ ?
- 3) What should be placed inside a try block ?
- 4) How do the following two statements differ in operation ?
`cin>>c;`
`cin.get(c);`
- 5) When should a program throw an exception ?
- 6) What is the use of 'this' pointer ?



3. A) Answer **any two** of the following : (2×3=6)

- 1) What are the differences between the access specifiers private and protected ?
- 2) What are the manipulators ? List out the various predefined manipulators supported by C++ I/O streams.
- 3) Write a program that accept student's score and prints the result on file.

B) What is runtime polymorphism ? Explain how C++ handles runtime polymorphism. 4

4. Answer **any two** of the following : (2×5=10)

- 1) Explain each form of inheritance with suitable example.
- 2) What are the file modes supported in C++ ? Give an example of each of these file modes.
- 3) What is virtual and pure virtual function ? Describe these functions with example.

5. Answer **any two** of the following : (2×5=10)

- 1) What are the virtual classes ? Explain the need for virtual classes while building a class hierarchy.
 - 2) Explain various file stream classes needed for file manipulations.
 - 3) Explain in detail exception handling in C++.
-



Seat No.	
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B.Sc. (ECS) – II (Semester – IV) Examination, 2014
COMPUTER SCIENCE (Paper – III)
Data Structures and Algorithms – II

Day and Date : Saturday, 15-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose correct alternative :

10

- 1) A graph consists of a _____
 - a) Set of vertices
 - b) Set of edges
 - c) Both a) and b)
 - d) None of these
- 2) A binary tree with n internal nodes has maximum of _____ leaf nodes.
 - a) n
 - b) $n + 2$
 - c) $n + 1$
 - d) $n + 3$
- 3) The data structure required for DFS is _____
 - a) Queue
 - b) Tree
 - c) Array
 - d) Stack
- 4) In a complete binary tree, if the no. of nodes is 15 then the height of the tree is _____
 - a) 2
 - b) 3
 - c) 4
 - d) 5
- 5) _____ is an example of divide and conquer algorithm.
 - a) Selection sort
 - b) Quick sort
 - c) Bubble sort
 - d) Insertion sort
- 6) An AVL tree is a binary search tree where height of left and right sub tree of any node will be with maximum difference _____
 - a) 0
 - b) 2
 - c) 1
 - d) -1
- 7) In B+ tree we can access record _____
 - a) Randomly
 - b) Sequentially
 - c) Both a) and b)
 - d) None of these
- 8) In a binary search tree, each node holds a single value and has _____
 - a) At most one branch
 - b) At most two branches
 - c) At most three branches
 - d) None of these



9) Sometimes terminal nodes are referred as _____

- a) Internal nodes
- b) External nodes
- c) Both a) and b)
- d) None of these

10) Which of the following algorithm has the worst time complexity of $n \log(n)$?

- a) Heap sort
- b) Quick sort
- c) Insertion sort
- d) Selection sort

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

10

- 1) What is complete binary tree ? Give example.
- 2) What is graph ? Explain directed graph.
- 3) What is searching ? What are the methods of searching ?
- 4) Give the applications of binary trees.
- 5) Define hash function.
- 6) What is AVL tree ?

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

6

- 1) Let us take an algebraic expression $(a + b) * c - (d * e)$ and construct a tree.
- 2) Write a function for post-order tree traversal.
- 3) Explain AOE network.

B) Explain the concept of efficiency of linear searching.

4

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

10

- 1) Write a function to count the number of internal nodes from a binary search tree.
- 2) Explain shortest path algorithm.
- 3) Write a program for insertion sort.

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

10

- 1) Explain B-tree with example.
 - 2) Explain adjacency list with suitable example.
 - 3) Show all the passes using quick sort for the following list.
17, 97, 45, 72, 105, 94, 32, 70, 102, 83, 18.
-



Seat No.	
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B.Sc. (ECS) – II (Sem. – IV) Examination, 2014
COMPUTER SCIENCE (Paper – IV)
Software Engineering – II

Day and Date : Monday, 17-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative. 10
- 1) A group of data elements handled as a bunch is called _____
 - a) data element
 - b) data structure
 - c) data attribute
 - d) none of these
 - 2) Which of the following is not type of system maintenance ?
 - a) Adaptive maintenance
 - b) Perfective maintenance
 - c) Constructive maintenance
 - d) Preventive maintenance
 - 3) Entity Relationship Diagrams (ERD) are used to design files
 - a) True
 - b) False
 - 4) CASE stands for _____
 - a) Case Application Software Engineering
 - b) Case Application System Engineering
 - c) Computer Aided System Engineering
 - d) Computer Aided Software Engineering
 - 5) _____ is an example of management tool.
 - a) Text editor
 - b) PERT
 - c) Compiler
 - d) File comparators
 - 6) An open rectangle _____
 - a) is a data store
 - b) represents a process
 - c) identifies data flow
 - d) defines a source or destination
 - 7) Coding and testing are done in which manner _____
 - a) top-down
 - b) bottom-up
 - c) ad-hoc
 - d) cross-sectional

P.T.O.



8) The longest method of conversion is _____
a) direct b) phased c) parallel d) pilot

9) A structure chart is _____
a) a document of what has to be accomplished
b) a hierarchical partitioning of the program
c) a statement of information processing requirements
d) all of the above

10) _____ individual components are tested to ensure they operate correctly.
a) System testing b) Acceptance testing
c) Unit testing d) Module testing

2. Answer **any five** of the following : 10
- 1) Define Entity and Relationship.
 - 2) Give the design principles of output.
 - 3) What do you mean by configuring a system ?
 - 4) What is normalization ?
 - 5) Which are the objectives of data capture ?
 - 6) What is system maintenance ?
3. A) Answer **any two** of the following : 6
- 1) Explain the concept of Structured English.
 - 2) Write note on Black-Box testing.
 - 3) Explain roles of CASE tools.
- B) Write note on structured chart. 4
4. Answer **any two** of the following : 10
- 1) Explain different types of output.
 - 2) What is testing ? Explain the need of testing.
 - 3) Explain top-down incremental implementation.
5. Answer **any one** of the following : 10
- 1) What statistics is collected for configuring the system ? Explain brief.
 - 2) Draw 0th level and 1st level DFD for College Admission System.
-



Seat No.	
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B.Sc. (ECS) – II (Semester – IV) Examination, 2014
ELECTRONICS
Organization of PC – II (Paper – V)

Day and Date : Tuesday, 18-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Total Marks : 50

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

1. Fill in the blanks with correct alternative and rewrite : 10
- 1) The change in i/p causes, change in o/p but after some delay is known as _____
a) Latent time b) Propagation delay
c) Delay time d) Both a) and c)
 - 2) The _____ μ p is 1st intel microprocessor offering multitasking and virtual memory.
a) 80186 b) 80286 c) 80386 d) 80486
 - 3) Intel 80286 is _____ bit μ p.
a) 8 b) 16 c) 32 d) 64
 - 4) A _____ is a set of rules and procedure for communication between computers.
a) Command b) Program c) Protocol d) Layer
 - 5) In _____ topology each computer is connected to all other computer.
a) Mesh b) Star c) Bus d) Ring
 - 6) Router operates at _____ layer.
a) Physical b) Data link c) Network d) Presentation
 - 7) _____ has its own CPU, RAM and DMA logic.
a) Processor b) NIC c) Monitor d) Printer
 - 8) 80486 has on chip cache memory of _____ KB.
a) 4 b) 8 c) 16 d) 32



9) In fibre optics the signal source is _____ wave.

- a) Radio b) Light c) Electrical d) None of these

10) In _____ data transmission is possible in one direction only.

- a) Simplex b) Half duplex c) Full duplex d) None of these

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

10

- a) Give advantages of TTL logic.
- b) Draw diagram of FPGA.
- c) Give names of four embedded systems.
- d) What is server based network ?
- e) Draw diagram of star topology.
- f) What is full duplex.

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

6

- 1) Compare TTL and CMOS logic.
- 2) Give features of 80286.
- 3) Give advantages of network.

B) Explain ethernet technology.

4

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

10

- 1) Explain CPLD in detail.
- 2) Explain guided media in detail.
- 3) Explain Hub and switches.

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

10

- 1) Explain network topology.
 - 2) Explain development in pentium series processor.
 - 3) Explain latest motherboard.
-



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**B.Sc. (ECS) – II (Semester – IV) Examination, 2014
MICROPROCESSOR – II (Paper – VI)**

Day and Date : Wednesday, 19-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives :

10

- 1) 60 MHz to 200 MHz is operating speed of _____ processor.
a) Pentium b) 80486 c) 80386 d) 80286
- 2) In absolute decoding _____ lines are used to generate chip select.
a) A_{19} b) A_{14-19} c) A_{16-19} d) A_{14}
- 3) In BSR mode of 8255 D_7 of control word is _____
a) 0 b) 1 c) 01 d) 10
- 4) _____ is processor control instruction.
a) RCL b) CLD c) RET d) JZ
- 5) _____ is bit manipulation instruction.
a) TEST b) AAA c) CMP d) NEG
- 6) Real memory of 80386 is _____
a) 1 GB b) 10 GB c) 4 GB d) 2 GB
- 7) 8257 is _____ device.
a) PPI b) PIC c) DMA d) PT/C
- 8) 80286 is _____ bit processor.
a) 20 b) 16 c) 8 d) 32
- 9) _____ is program execution transfer instruction.
a) CMPS b) CMC c) INTO d) LDDS
- 10) Pentium-II is introduced in _____
a) 1997 b) 1996 c) 1995 d) 1993

P.T.O.

SLR-Q – 34



2. Attempt **any five** of the following : **10**
- 1) Explain logical instructions.
 - 2) Explain features of 80486.
 - 3) Explain bus contention.
 - 4) Explain PUSH and POP instruction.
 - 5) Explain features of pentium-III.
 - 6) Explain BSR mode of 8255.
3. A) Attempt **any two** of the following : **6**
- 1) Explain program execution transfer instruction of 8086.
 - 2) Explain concept of I/O mapped I/O.
 - 3) Compare P-II and P-IV.
- B) Explain control word of 8253. **4**
4. Attempt **any two** of the following : **10**
- 1) Compare features of 80286 and 80386.
 - 2) Write program to arrange data in ascending order.
 - 3) Explain operation of 8237.
5. Attempt **any two** of the following : **10**
- 1) Explain features of pentium-pro.
 - 2) Explain processor control instruction of 8086.
 - 3) Explain interfacing of LED display.
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Seat No.	
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B.Sc. (ECS) – II (Semester – IV) Examination, 2014
ENGLISH – II (Paper – VII)
English for Communication

Day and Date : Thursday, 20-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. A) Fill in the blanks in the following sentences by choosing the correct alternatives. 6
- 1) The poet's eyes are blinded with tears because of the _____
 - a) memory of the tree only
 - b) memory of the tree and of companions
 - c) memory of the mother land
 - d) memory of her youth
 - 2) The effect of industrial development on women is best illustrated by the fact that _____
 - a) the family's dependence upon women's earnings has increased
 - b) women's workloads have increased
 - c) there is use of contraceptive technology
 - d) families are more affluent now than what they were
 - 3) The talkative man was reluctant to pay wages to the fifty coolies he had hired as _____
 - a) they did not push the engine properly
 - b) they had not completed their job
 - c) they created trouble for the temple elephant which was dragging the engine
 - d) one of them slapped the talkative man in the face
 - 4) The giant wears the scarf, the scarf is _____
 - a) branches
 - b) flowers
 - c) creeper
 - d) leaves



- 5) _____ is the central character of 'Nobody Here But'.
- a) Cliff Anderson b) Bill Billing c) Mary Ann d) Junieur
- 6) Shukra Neeti written in _____ period.
- a) Gupta b) Tipu Sultan c) Bhoj d) Chanakya

B) Match the following :

4

A

B

- | | |
|---------------|---------------------------------------|
| 1) Grope | a) A resting place |
| 2) Minstrel | b) Weigh down |
| 3) Overwhelm | c) Unknown to future |
| 4) Unforeseen | d) A heavenly singer |
| | e) Feel about as one does in the dark |

2. Give brief answers to the following questions (attempt **any five**) :

10

- 1) What is neo-natal mortality ?
- 2) What was the reaction of talkative man friends and relatives on winning the prize ?
- 3) Who encouraged Bill to propose to Marry Ann ?
- 4) What is the first significant step to technological development ?
- 5) What was the attitude of the bird when it watched a dog ?
- 6) Why is the tree ever dearer to the poet ?

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

6

- 1) In the poem 'The casualties' poet speaks of certain casualties of War. What are they ?
- 2) Describe the incident of pulling the engine by the elephant.
- 3) The character of Marry Ann.

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

4

- 1) Below are given some statements, prepare questions to expect these statements as answers :
 - 1) Statement : I like Sachin Tendulkar
Question :
 - 2) Statement : I did my graduation in Solapur University.
Question :



3) Statement : I am not interested in politics sir.

Question :

4) Statement : I have no previous experience.

Question :

4. Attempt **any one** of the following : **10**

1) Get together is a sports club for young men and women in your town/city. Write rules for its membership some points are suggested here.

I) Who can be the members ?

(State the range of ages)

II) Is the membership restricted to the residents of your place ?

III) Can there be temporary members ? On what fees/conditions ?

IV) What sports facilities are made available to the members ?

V) Is there separate monthly fee for each sports ? e.g. Table Tennis, Badminton, etc.

VI) What will the club provide ?

VII) And any other points you can think of.

2) Express your agreement, disagreement and partial agreement in the following topic.

I) Television has badly affected reading habit of students.

5. Write a application letter for the post of lecturer. **10**



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B.Sc. (E.C.S. – III) (Semester – V) Examination, 2014
COMPUTER SCIENCE (Paper – I)
Data Communication and Networking – I

Day and Date : Saturday, 1-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

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

- 1) Token ring belongs to _____ Topology.
 - a) star ring
 - b) star bus
 - c) mesh
 - d) star bus
- 2) In _____ switched networks reassembly is required.
 - a) Message
 - b) Packet
 - c) Time
 - d) All
- 3) A _____ signal completes a pattern within period and repeats that pattern over identical periods.
 - a) Analog
 - b) Digital
 - c) Periodic
 - d) Non-periodic
- 4) The degeneration of a signal over distance on a network cable is called _____
 - a) Noise
 - b) Distortion
 - c) Attenuation
 - d) Fluctuation
- 5) ISDN is an example of _____ switched network.
 - a) Circuit
 - b) Packet
 - c) Message
 - d) Time
- 6) The data link layer deals with _____
 - a) packets
 - b) frames
 - c) user data
 - d) binary data



- 7) _____ is the central device in star topology.
- a) Hub/switch
 - b) STP server
 - c) Router
 - d) PDC
- 8) If two frames are transmitted simultaneously they overlap in time and resulting signal known as _____
- a) windowing
 - b) collision
 - c) carrier sensing
 - d) swapping
- 9) _____ allows to acknowledge correctly received frames and to discard incorrect ones in error detection.
- a) CRC
 - b) hamming code
 - c) both
 - d) none
- 10) Routing algorithms are applied on _____ layer policies.
- a) network
 - b) data link
 - c) transport
 - d) all

2. Answer **any five** of the following : 10
- 1) What is error flow ?
 - 2) Discuss about microwaves.
 - 3) What is ALOHA ?
 - 4) Define Internet.
 - 5) What is framing ?
 - 6) What is datagram ?
3. A) Answer **any two** of the following : 6
- 1) What is analog transmission ? List different Medias for analog transmission.
 - 2) Discuss various components of network.
 - 3) Discuss network layer design issues.
- B) Write a note on application layer of OSI reference model. 4
4. Answer **any two** of the following : 10
- 1) What is the difference between LAN and WAN ?
 - 2) Explain Simplex Stop-and-wait Protocol.
 - 3) Discuss various routing techniques.
5. Answer **any two** of the following : 10
- 1) What is Multiplexing ? Explain FDM and TDM.
 - 2) Explain architecture of TCP/IP.
 - 3) Discuss various congestion control policies.
-



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B.Sc. (ECS) – III (Semester – V) Examination, 2014
DATABASE MANAGEMENT SYSTEM – I
Computer Science (Paper – II)

Day and Date : Monday, 3-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

1. Choose correct alternative :

10

- 1) A schema describe
 - a) data elements
 - b) records and files
 - c) record relationship
 - d) all of above
- 2) Association between two attributes of the same table is
 - a) Functional dependency
 - b) MVD
 - c) Join dependency
 - d) None of above
- 3) Specialization represents bottom-up manner.
 - a) true
 - b) false
- 4) What is degree of dual table ?
 - a) 1
 - b) 0
 - c) 2
 - d) 3
- 5) _____ character represents zero or more character while matching the pattern.
 - a) *
 - b) –
 - c) %
 - d) ?
- 6) Alter table is _____ statement.
 - a) DML
 - b) DDL
 - c) DCL
 - d) TCL
- 7) Each row in the table is
 - a) Cardinality
 - b) Degree
 - c) Tuple
 - d) Attribute
- 8) DBA stands for
 - a) Database Administrator
 - b) Database Access
 - c) Database Analysis
 - d) None of above

P.T.O.



- 9) ER model was introduced by
- a) E. F. Codd
 - b) P. P. Chen
 - c) James Gosling
 - d) Ken Thomson
- 10) The functions that acts on set of values are called
- a) Aggregate function
 - b) Scalar function
 - c) Row set function
 - d) None of these

2. Answer **any five** : **10**

- 1) What is identifying relationship ?
- 2) What is use of specialization ?
- 3) Write physical data independency.
- 4) Define foreign key.
- 5) Write selection operation in relational Algebra.
- 6) List DDL statements.

3. A) Answer **any two** : **6**

- 1) How to convert E-R diagram which contain generalization into table ?
- 2) What are different types of database users ?
- 3) Define attribute, domain and degree of relation.

B) Write notations used for E-R diagram. **4**

4. Answer **any two** : **10**

- 1) List and explain aggregate functions used in SQL.
- 2) Write a note on network model.
- 3) Explain inner join with e.g.

5. Answer **any two** : **10**

- 1) What is sub query ? What is difference in join and sub query ?
 - 2) Explain 2nd and 3rd normal form with e.g.
 - 3) Explain Dr. Codd's rule (any 5).
-



Seat No.	
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B.Sc. (ECS) – III (Semester – V) Examination, 2014
COMPUTER SCIENCE (Paper – III)
Core Java

Day and Date : Wednesday, 5-11-2014

Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

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

1. A) Choose the correct alternatives. 7
- 1) Which of the following inheritance is not related with Java ?
a) multiple b) multilevel c) single d) none of these
 - 2) Which of the following type variables single copy exist for all objects of that class ?
a) non-static public variable b) static variable
c) non-static private variable d) non-static protected variable
 - 3) Any class's further extension is stopped by using _____ modifier.
a) finally b) finalize c) final d) all of these
 - 4) Max priority of a thread is _____
a) 5 b) 10 c) 1 d) 100
 - 5) Which of the following is false ?
a) one class implements multiple interfaces
b) one interface can be implemented by more than one classes
c) one interface can implement another interface
d) none of these
 - 6) Which of the following class represents all errors and exceptions occurred in Java ?
a) Throwable b) Error c) Exception d) IO Exception
 - 7) We can use nesting for _____
a) class b) try
c) both a) and b) d) none of these



1. B) State **true** or **false**. **3**
- 1) Character class (Wrapper class) contains only one constructor.
 - 2) Load factor of Hash map and Hash table is 0.85.
 - 3) Abstract class can contains constants.
2. Solve **any five**. **10**
- a) Importance of Wrapper Classes
 - b) Uses of final keyword
 - c) Static members
 - d) Runnable interface
 - e) Hash set
 - f) Explain two methods of object class.
3. A) Solve **any two**. **6**
- 1) Explain life cycle of a thread.
 - 2) Differentiate method overloading with method overriding.
 - 3) Differentiate away list with vector class.
- B) Write a program that will demonstrate call by value and call by reference mechanism. **4**
4. Solve **any two**. **10**
- 1) Write a program to make child threads by implementing runnable interface.
 - 2) Explain need of throws clause with the help of example.
 - 3) What is object serialization ? Explain it with example.
5. Solve **any two**. **10**
- 1) What is package ? Explain package along with its import with the help of example.
 - 2) Write a program demonstrate interface implementation mechanism.
 - 3) Explain different access specifiers supported by Java with the help of example.
-



Seat No.	
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B.Sc. (ECS) – III (Semester – V) Examination, 2014
COMPUTER SCIENCE (Paper – IV)
Theory of Computer Science

Day and Date : Friday, 7-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative :

10

1) If $A = \{ x \mid x \text{ is a multiple of } 4 \}$ and

$B = \{ x \mid x \text{ is a multiple of } 8 \}$, then _____

a) $A \cup B = B$

b) $A \cap B = A$

c) $A \cap B = \phi$

d) None

2) The empty string is the string with _____

a) no occurrence of symbols

b) zero occurrence of symbols

c) non zero occurrence of symbol

d) None

3) If A has n elements, the $P(A)$ has _____ elements.

a) n^2

b) 2^n

c) 2^{n+1}

d) $2^n + 1$

4) $\lambda + 1^*(011)^*(1^*(011)^*)^* = ?$

a) $(1 + 011)^*$

b) $1^*(011)^*$

c) $1^*01^*(1 + 011)^*$

d) None of these

5) Which one is True ?

a) $(10)^* = 1^*0^*$

b) $(10)^* = (1^*0^*)^*$

c) $(10)^* = 1^* + 0^*$

d) $\{1010\}$ belongs $(10)^*$



- 6) Which of the following identity does not hold ?
- a) $\lambda R = R\lambda = R$ b) $\lambda + R = R + \lambda = R$
 c) $\phi R = R\phi = \phi$ d) $\phi + R = R + \phi = R$
- 7) Choose the correct statements
- a) all languages can be generated by CFG
 b) any regular language has not an equivalent CFG
 c) some non regular language cannot be generated by an CFG
 d) some regular languages cannot be generated by an CFG
- 8) The productions : $E \rightarrow E + E \mid E - E \mid E * E \mid id$, _____
- a) generated an inherently ambiguous language
 b) generate an ambiguous language
 c) are unambiguous
 d) none
- 9) Which one of the following is true about PDA's ?
- a) PDA has an auxiliary memory in the form of a stack
 b) PDA is represented by 7 tuple ie $(S, \Sigma, \Gamma, \delta, q_0, Z_0, F)$
 c) $s : s \times (\Sigma \cup \{\lambda\}) \times \Gamma \rightarrow s \times \Gamma^*$
 d) All above
- 10) The definition of Turing machine is robust because _____
- a) Functional testing of Turing machines finds no errors
 b) Turing machines will not crash for any input string
 c) Certain changes such as many tapes result in machines of equivalent power
 d) Turing machine has nothing to do with robustness

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

10

- 1) Give the CFG for generating and alternating sequence of 0 and 1.
- 2) Design a relay machine to input from $(a + b)^*$ such that if input has substring 'aba', the machine outputs 'A', if it has substring 'aab', the machine outputs 'B' otherwise 'C'.



3) Construct a DFA that accept the following language

$$\{x \in \{a, b\} \mid |x|_a = \text{odd and } |x|_b = \text{even}\}$$

4) Give the regular expression for the language

a) at least two a's

b) any string in 'a' or any string in 'c' followed by any string in 'b'.

5) Eliminate ϵ -productions from grammar G given as,

$$A \rightarrow aBb \mid bBa$$

$$B \rightarrow aB \mid bB \mid \epsilon.$$

6) Let $A = \{a, b, c\}$, find $P(A)$. Also find $n(A)$ and $n(P(A))$.

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

6

1) Explain Turing machine model.

2) Write the grammar for generating the variable name as, "Windows 97", which can be given by the regular expression (letter) (letter | digit)*.

3) Define Moore and Melay machine.

B) Construct a NPDA, M for the language

$$L = \{a^n b^{2n} \mid n \geq 0\} \text{ such that } L = \text{LCM}.$$

4

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

10

1) Convert the following to CNF

$$S \rightarrow aSc \mid Ab$$

$$A \rightarrow SA \mid c$$

2) Check whether the following grammar G is ambiguous or not, for the string "a – b" ; if found ambiguous, remove the ambiguity and write an equivalent unambiguous grammar

$$E \rightarrow F - E \mid E - F \mid F, F \rightarrow a \mid b.$$

3) Design a TM for the following language "the set of strings with an equal number of 0's and 1's".



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

10

- 1) Let R be an equivalence relation in $\{0\}^*$ with the following equivalence classes.

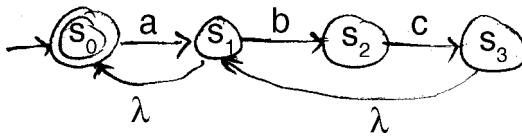
$$[\lambda]_R = \{\lambda\} = \{0\}^\circ$$

$$[0]_R = \{0\} = \{0\}'$$

$$[00]_R = \{0\}^2 \cup \{0\}^3 \cup \{0\}^4 \cup \{0\}^5 \cup \dots$$

Show that R is a right congruence.

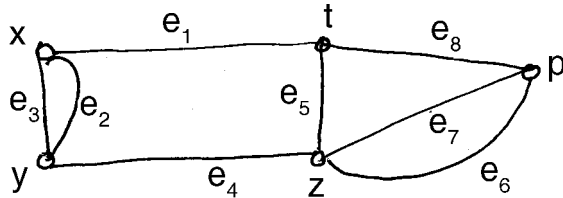
- 2) Obtain equivalent DFA for the following NFA's.



- 3) Define Relation. Explain the properties of relation with example.
-

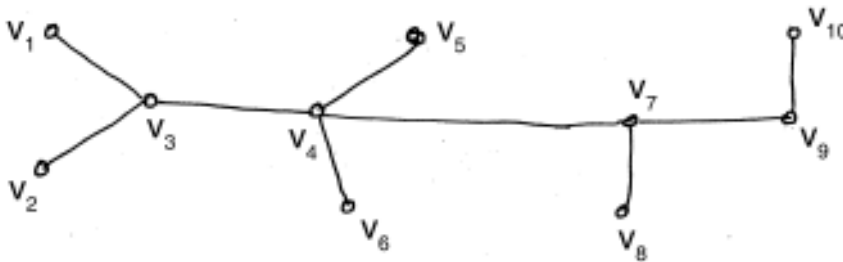


- v) Define a binary tree with suitable example.
- vi) Find the number of edges in a complete graph with six vertices.
- vii) Find the incidence matrix of the following graph.



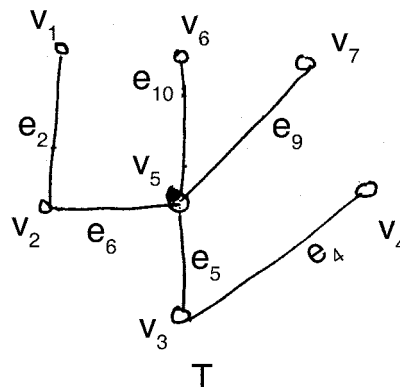
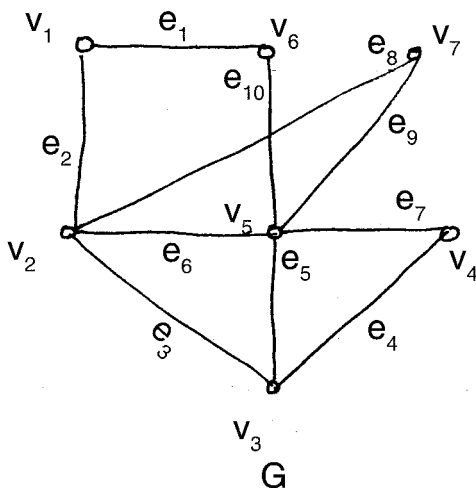
3. A) Attempt **any two** from the following : 10

- i) Give an example of a connected graph that has
 - a) an Eulerian circuit but no Hamilton cycle.
 - b) a Hamiltonian cycle but no Euler circuit.
- ii) Write a note on Koningsberg's seven bridges problem.
- iii) Find the eccentricity of each vertex of the tree given below. Hence find its centre.



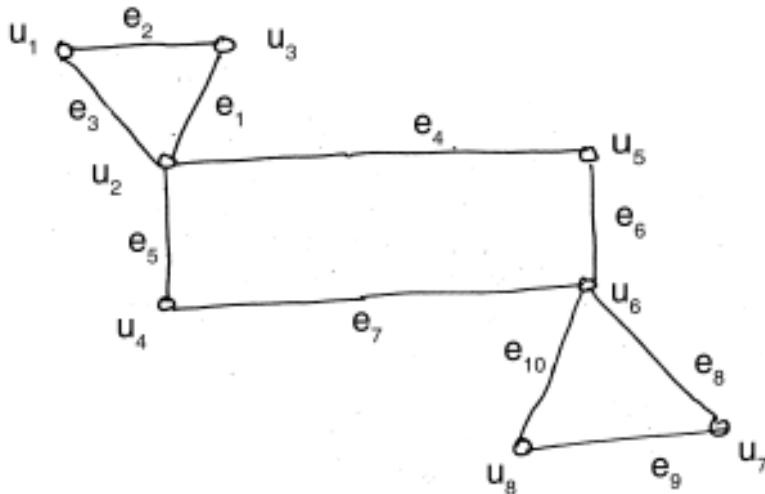
B) Attempt **any one** from the following : 10

- i) Define fundamental circuit and fundamental cutset. Find all fundamental circuits and fundamental cutsets of G w.r.t. spanning tree T given below.





ii) Define Eulerian circuit and Euler graph. Use Fleury's algorithm to trace an Eulerian circuit for the following graph.



SECTION – II

1. Choose the correct alternative :

5

- 1) Homogeneous system of linear equations is always _____
 - a) inconsistent
 - b) consistent
 - c) trivial
 - d) none of these
- 2) $0.8765E_{10} \div 0.3456E_4 =$ _____
 - a) $2.5382E_7$
 - b) $0.2538E_7$
 - c) $0.2538E_6$
 - d) $0.2538E_{14}$
- 3) The equation $xe^x - 5 = 0$ is called as _____ equation.
 - a) polynomial
 - b) transcendental
 - c) algebraic
 - d) differential
- 4) The relation between E and Δ is _____
 - a) $E = 1 + \Delta$
 - b) $E = 1 - \nabla$
 - c) $E = 1 - \Delta$
 - d) None of these
- 5) Trapezoidal rule is obtained by putting n = _____ in general quadrature formula.
 - a) 1
 - b) 2
 - c) 3
 - d) 4



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

10

- i) Define homogeneous system of linear equation.
- ii) Evaluate :
 - a) $0.6984E_{12} \times 0.9874E_{10}$
 - b) $1.3562E_8 \div 0.5346E_4$
- iii) Find the interval in which the root of the equation $x^3 - 2x - 5 = 0$ lies.
- iv) Show that $(E\nabla) f(x) = \Delta f(x)$.
- v) Write the formula for K_1 , K_2 and K in Runge-Kutta 2nd order method.
- vi) Write the Simpson's $\left(\frac{1}{3}\right)^{\text{rd}}$ rule for integration.
- vii) Write Lagrange's interpolation formula for the following data :

x	x_0	x_1	x_2	x_3
$y = f(x)$	y_0	y_1	y_2	y_3

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

10

- i) Obtain A^{-1} , if exist by using row reduction method.

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

- ii) Given that $\sin 45^\circ = 0.7071$, $\sin 50^\circ = 0.7660$, $\sin 55^\circ = 0.8192$, $\sin 60^\circ = 0.8660$, find the value of $\sin 53^\circ$ by using Lagrange's interpolation formula.
- iii) By using Euler's method, solve the differential equation $\frac{dy}{dx} = x^2 + y^2$ with $y(1) = 2$, find $y(1.4)$ by taking $h = 0.1$.

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

10

- i) State and derive Newton's forward difference interpolation formula.

- ii) Compute $\int_4^{5.2} \log_e^x dx$ by dividing the interval of integration into 6 equal subintervals by using
 - a) Trapezoidal rule

- b) Simpson's $\left(\frac{1}{3}\right)^{\text{rd}}$ rule.
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Seat No.	
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B.Sc. (ECS) – III (Semester – V) Examination, 2014
COMPUTER SCIENCE
Web Technology and E-Commerce – I (Paper – V)

Day and Date : Saturday, 8-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative : 10
- 1) _____ property of page directive is used to display control tree.
a) Tree b) Controls c) Control tree d) Trace
 - 2) _____ property of TextBox control determines whether TextBox is display to user or not.
a) Enable b) Visible c) Show d) Hide
 - 3) _____ property of bulleted list control is set to display items in hyperlink form.
a) Display mode b) Display style
c) Display hyperlink d) Hyperlink
 - 4) _____ state management technique is not useful for sensitive data.
a) Application b) Session
c) View d) Query string
 - 5) _____ is the last stage of web form life cycle.
a) Page-render b) Page-unload
c) Page-Exit d) None of these
 - 6) Common type system is in _____
a) CLR b) RCT c) RCW d) GAC
 - 7) We can not add more than one web.config files.
a) True b) False

P.T.O.



- 8) Common style information files are stored in _____ location.
 - a) Browser
 - b) Master pages
 - c) Themes
 - d) All of these
- 9) E-mail address can be validate by using _____ validation control.
 - a) E-mail expression
 - b) Basic expression
 - c) Regular expression
 - d) Pattern expression
- 10) Assemblies are building blocks of .Net framework.
 - a) True
 - b) False

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

- a) Namespace.
- b) Difference between ASP and ASP.Net.
- c) Import directive.
- d) Self page posting.
- e) FTP location.
- f) Website life cycle.

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

- i) Explain multiview and view control.
- ii) Add 3 rows and 4 columns in table by using runtime method.
- iii) Explain custom validator control with example.

b) What is Assemblies ? Explain in detail. 4

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

- a) What is meant by dynamic compilation ? Explain in detail.
- b) Explain application state and view state in detail.
- c) What is client side and server side validation ? Explain regular expression and compare validator control in detail.

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

- a) Explain different application folders used in ASP.Net.
 - b) Explain how to create nested master pages with example.
 - c) Explain list class with example.
-



Seat No.	
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B.Sc. (ECS) – III (Sem. – V) Examination, 2014
COMPUTER SCIENCE (Paper – VI)
Visual Programming and Application Software – I

Day and Date : Monday, 10-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative : 10
- 1) _____ is responsible for managing code execution at run time.
a) MSIL b) CLR c) CTS d) CLS
 - 2) Which of the following characteristic of the Base Class Libraries (BCL) ?
a) Object-oriented b) Language-independent
c) Enhances the productivity d) All of these
 - 3) Namespaces are always private.
a) True b) False
 - 4) Which of the following structure contains in the system namespace ?
a) Object b) Delegate c) Int32 d) Console
 - 5) Abstract classes contains abstract as well as non-abstract methods.
a) True b) False
 - 6) _____ is base of all the other pre-defined and user-defined datatypes.
a) Delegate type b) Array type
c) String type d) Object type
 - 7) The space required for structure variable is allocated on stack.
a) True b) False
 - 8) _____ are default parameters.
a) Value parameters b) Reference parameters
c) Output parameters d) Address parameters



Seat No.	
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B.Sc. (E.C.S.) – III (Semester – VI) Examination, 2014
COMPUTER SCIENCE (Paper – I)
Data Communications and Networking – II

Day and Date : Saturday, 1-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternatives :

10

- 1) Squid is _____
 - a) Proxy server
 - b) Web server
 - c) Name server
 - d) DHCP server
- 2) A TCP segment is encapsulated in _____
 - a) An IP datagram
 - b) An Ethernet frame
 - c) A UDP user datagram
 - d) None of the above
- 3) _____ protocol is used for transferring mails over internet.
 - a) POP
 - b) IP
 - c) SMTP
 - d) HTTP
- 4) A proxy firewall filters at the network layer.
 - a) True
 - b) False
- 5) _____ allows organizations to use the global internet for private and public communications.
 - a) WAN
 - b) MAN
 - c) VPN
 - d) Virtual LAN
- 6) A bridge is _____ device.
 - a) Networking
 - b) Connecting
 - c) Inter networking
 - d) Routing
- 7) _____ allow users to run web applications and distributed programmes from the server.
 - a) Web server
 - b) File server
 - c) Terminal server
 - d) Application server



- 8) In _____ layer, firewall are installed.
a) Network b) Physical c) Data link d) Session
- 9) If an IP address starts with a bit sequence of 110, it is a class _____ address.
a) A b) B c) C d) D
- 10) _____ server uses distributed file service.
a) Print b) File c) Web d) Database

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

- 1) What is a Dig server ?
- 2) Which are various tasks performed by logon scripts ?
- 3) What is substitution cipher ?
- 4) Which are various control bits in TCP segment ?
- 5) What is meant by active remote sensor ?
- 6) Which are two modes of POP3 protocol ?

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

- 1) Explain DNS in short.
- 2) Explain limitations of firewall.
- 3) Explain user profile of windows 2003 server.

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

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

- 1) Sambar server
- 2) Audio compression
- 3) Digital signature

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

- 1) Explain blue tooth in detail.
 - 2) Explain the responsibilities of N/W administrator.
 - 3) How you can manage groups using group add, group mod and group del ?
-



Seat No.	
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B.Sc. (ECS) – III (Sem. – VI) Examination, 2014
COMPUTER SCIENCE (Paper – II)
Database Management System – II

Day and Date : Monday, 3-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose correct alternative. 10
- 1) Timestamp ordering protocol use lock
a) true b) false
 - 2) The _____ attribute is used to declare variable base of definition of column.
a) % row type b) % type c) type d) int
 - 3) The process restoring the database to a correct state in the event of a failure is known as
a) database recovery b) modification
c) transaction d) none of above
 - 4) Binary lock has following state
a) locked and unlocked b) shared, exclusive
c) both a) and b) d) none of above
 - 5) Shadowing maintain
a) 2 tables b) 3 tables c) 4 tables d) none of above
 - 6) The point in the schedule where transaction has obtained its final lock is
a) deadlock b) commit point
c) lock point d) none of above
 - 7) The out parameter behave like
a) constant b) uninitialized variable
c) regular variable d) none of above



- 8) A sequence of log record is called
a) file b) database c) log file d) none of above
- 9) Shadowpaging was introduced by
a) Bohem b) E. F. Codd c) Lorie d) None of above
- 10) A schedule that will always produce identical result is
a) equivalent schedule b) complete
c) serial schedule d) non-serial schedule

2. Answer **any five**. **10**

- 1) What is shared lock ?
- 2) Which attributes are used for explicit cursor ?
- 3) What are the problems due to concurrency ?
- 4) Write advantages of PL/SQL.
- 5) Write syntax of for loop with e.g.
- 6) Define transaction and list properties of it.

3. A) Answer **any 2**. **6**

- 1) List the types of schedule.
- 2) Discuss different types of failures.
- 3) Define starvation and timestamp.

B) Write a PL/SQL function to check number is prime or not. **4**

4. Answer **any 2**. **10**

- 1) What is trigger ? How it works ? Explain its types.
- 2) Discuss the protocols used in dead lock prevention.
- 3) Write PL/SQL block for addition and multiplication of three numbers.

5. Answer **any two**. **10**

- 1) Explain the states of transaction.
 - 2) Explain parameterized cursor with e.g.
 - 3) Write a note on function and procedure. What is difference between them ?
-



Seat No.	
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B.Sc. (ECS) – III (Semester – VI) Examination, 2014
COMPUTER SCIENCE
Advanced Java (Paper – III)

Day and Date : Wednesday, 5-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives : 10
- 1) In URL query string, parameter pairs are separated using _____ symbol.
a) ? b) = c) & d) None of these
 - 2) The GET and POST methods are specified in a _____
a) CGI program b) Java program
c) HTML program d) URL string
 - 3) By default, Tomcat runs on a port
a) 8080 b) 1080 c) 9090 d) 9890
 - 4) The _____ event is generated when button is clicked.
a) Item b) Action
c) Change d) None of these
 - 5) To provide a behaviour to the Applet one has to override the _____ method in the Applet class.
a) start () b) applet () c) load () d) init ()
 - 6) The _____ interface provides methods that are used to execute static SQL statements.
a) Connection b) Result set
c) Driver manager d) Statement
 - 7) _____ can encapsulates common set of SQL commands.
a) Stored procedure b) Statements
c) Prepared statements d) Callable statements



- 8) _____ are strings of text that a server can send to a client.
a) Session b) State c) Cookies d) All of these
- 9) _____ objects are used without need to explicitly declare them.
a) Explicit b) Request c) Response d) Implicit
- 10) _____ is called for each HTTP Request.
a) init () b) service () c) update () d) change ()

2. Answer **any five** of the following : **10**
- a) Explain any two event classes.
 - b) Explain briefly JButton Class.
 - c) Explain all four types of JDBC drivers.
 - d) Note on servlet model.
 - e) Explain MVC architecture briefly.
 - f) What is cookies ? Explain its usage.
3. A) Answer **any two** of the following : **6**
- 1) Explain any three methods of statement interface.
 - 2) Explain JFrame Class with the help of example.
 - 3) Explain briefly three kinds of EJBs.
- B) Explain various JSP elements in briefly. **4**
4. Answer **any two** of the following : **10**
- 1) Write a program to design a Applet that will demonstrate event handling mechanism using Mouselistener Interface.
 - 2) Write a program to design a Login Page by using servlet technology.
 - 3) Explain Servlet Life Cycle.
5. Answer **any two** of the following : **10**
- 1) Write a program that will demonstrate implementation of prepared statement.
 - 2) What is JApplet ? What are its advantages and disadvantages ?
 - 3) What is Swing technology ? Explain its advantages over AWT.
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Seat No.	
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B.Sc. (ECS) – III (Semester – VI) Examination, 2014
COMPUTER SCIENCE
Compiler Construction (Paper – IV)

Day and Date : Friday, 7-11-2014

Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Choose the correct alternatives : 10

- 1) A set of terminal symbols, sometimes referred to as _____
 - a) Tokens
 - b) Patterns
 - c) Lexemes
 - d) All
- 2) An intermediate representation is typically some combination of graphical notation and _____
 - a) Three-address code
 - b) Intermediate code
 - c) Code for dag
 - d) Code for syntax tree
- 3) _____ collectors visit and mark all reachable objects in first tracing step and then sweep the heap to free up unreachable objects.
 - a) Mark-and-sweep
 - b) Unmark-and-sweep
 - c) Garbage
 - d) All above
- 4) _____ errors include misspelling of identifiers.
 - a) Semantic
 - b) Syntactic
 - c) Lexical
 - d) Logical
- 5) A _____ is a pair consisting of a token name and optional attribute value.
 - a) Token
 - b) Pattern
 - c) Lexeme
 - d) All



3. A) Answer **any two** of the following : **6**
- 1) Explain with example, the use of algebraic identities.
 - 2) Explain case statement.
 - 3) Give the algebraic properties of regular expressions.
- B) Discuss any two implementations of three-address statement. **4**
4. Answer **any two** of the following : **10**
- 1) Explain synthesized attribute on the parser stack with example.
 - 2) What is bootstrapping ? Explain.
 - 3) Explain handle and handle-pruning with example.
5. Answer **any two** of the following : **10**
- 1) Discuss the parameter passing techniques.
 - 2) Explain recursive and non-recursive predictive parsing.
 - 3) Construct the dag for the following basic block :
- $t_1 := a + b$
 - $t_2 := c + d$
 - $t_3 := e - t_2$
 - $t_4 := t_1 - t_3$
- Also give the code sequence and revised code sequence of the same.
-



Seat No.	
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B.Sc. (ECS) – III (Sem. – VI) Examination, 2014
COMPUTER SCIENCE (Paper – VI)
Visual Programming and Application Software – II

Day and Date : Monday, 10-11-2014
Time : 11.00 a.m. to 1.00 p.m.

Max. Marks : 50

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

1. Choose the correct alternative. **10**
- 1) Which of the following assembly is referenced by more than one application ?
a) Private assembly b) Shared assembly
c) Both a) and b) d) None of these
 - 2) _____ allows users to select a date or time value in a number of different formats.
a) Date Picker b) Time Picker
c) Date Time Picker d) All of these
 - 3) Radio buttons are generally used as a group _____
a) True b) False
 - 4) _____ property allows you to navigate all the controls in a logical manner.
a) Index b) Tab c) Tab Index d) Tab Order
 - 5) An assembly contains the MSIL code of the compiled application.
a) True b) False
 - 6) In a multicast delegate, the result of _____ method invoked.
a) First b) Last c) All d) None of these
 - 7) _____ is used to implement the event handling mechanism.
a) Properties b) Indexers c) Delegates d) None of these
 - 8) In LINQ _____ is used to filter the data returned by a query.
a) group clause b) order by clause
c) select clause d) where clause



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

10

- i) Define – Attribute.
- ii) State empirical relation between mean, median and mode.
- iii) Define – open-end classes.
- iv) Let $n = 10$, $\sum X^2 = 400$, $\sum X = 25$. Find S.D.
- v) Let $n = 15$, $\sum u = 30$, $u = \frac{X - 5}{10}$, find \bar{X} .
- vi) Let $\mu'_1 = 4$, $\mu'_2 = 16$, $\mu'_3 = 256$, find μ_3 .
- vii) The sum and difference of upper and lower quartiles are 40 and 30 respectively. Find Q. D.

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

10

- I) Define – A.m. State merits and demerits of A.m.
- II) Define – population, census method. State limitations of census method.
- III) The A.m. of salary of all workers in a factory was Rs. 1,000. The A.m. of salary paid to male and female employees were Rs. 1,400 and Rs. 700 respectively. Find ratio of male and female employees in the factory.

B) Attempt **any one** :

10

- I) Define – Skewness. Explain types of skewness. State different measures of skewness.
- II) Draw histogram to represent the following data and hence find mode

Marks :	20 – 25	25 – 30	30 – 35	35 – 40
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No. of students :	9	14	27	25
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Marks :	40 – 45	45 – 50	50 – 55
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No. of students :	18	12	6
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SECTION – II

1. Select most correct answer : 5

i) How many three letters words can be formed using the letters of the word 'COMPUTER' without repetition.

- a) 21 b) 56 c) 336 d) 356

ii) ${}^{12}C_4 + {}^{12}C_3 = ?$

- a) ${}^{13}C_4$ b) ${}^{13}C_3$ c) ${}^{12}C_7$ d) ${}^{13}C_7$

iii) If A, B and C are exhaustive events defined on sample space Ω then $P(A \cup B \cup C)$ is _____

- a) 1 b) zero c) 0.3 d) 0.5

iv) For a discrete r.v.X if $E(X) = 1$ then $E(10 - X) =$ _____

- a) 1 b) 10
c) 9 d) any constant value

v) Let $X \sim B(n, 0.3)$ and $v(x) = 2.1$ then $n =$ _____

- a) 12 b) 10
c) 15 d) none of these

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

i) Define mutually exclusive events and equally likely events.

ii) Define discrete random variable.

iii) State additive property of Poisson distribution.

iv) For a binomial distribution with parameters $n = 10$ and $p = 0.4$, find mean and S.D.

v) Give relative frequency approach definition of probability.

vi) If $P(A) = \frac{3}{10}$, $P(B) = \frac{5}{10}$, $P(A \cap B) = \frac{4}{10}$ find $P(A/B)$ and $P(A \cup B)$.

vii) In how many ways 2-digit numbers can be formed using the digits 1, 2, 6, 8, 9 if repetition is allowed.



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

10

- i) State addition and multiplication principles of counting. Give one example for each.
- ii) The p.m.f. of a discrete r.v. X is as follows :

X	-2	-1	0	1	2	3
$P(X = x)$	0.1	0.15	0.05	0.20	0.30	0.20

Find $P(X^2 \leq 5)$ and $P(|X| \leq 1)$.

- iii) Find the value of n if ${}^{15}P_{n-1} : {}^{16}P_{n-2} = 3 : 4$.

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

10

- i) Give axiomatic definition of probability. Prove that if A is subset of B , then $P(A) \leq P(B)$.
 - ii) Suppose A and B are two events defined on the sample space Ω . If the events A and B are independent, then prove that \bar{A} and B are also independent events. Also prove that A and \bar{B} are also independent.
-

SLR-Q – 6



9) An interface between user and computer system is _____

- a) Machine
- b) Operating system
- c) CPU
- d) None of these

10) Digitize is an _____ device.

- a) Output
- b) Touch screen
- c) Storage
- d) Input

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

- a) Low level language
- b) Gray code
- c) Note book computer
- d) Multi programming
- e) Joy sticks
- f) Application of computer.

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

- i) Explain batch files with parameters.
- ii) Write a note on weighted and unweighted code.
- iii) Write a note on monitors.

B) Convert the following : **4**

$(1A3.4F)_{16}$ to Decimal, octal and binary.

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

- 1) Explain different type of operating system.
- 2) Write a note on commands on file.
- 3) Explain laser printer.

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

- 1) Differentiate frame work computer and super computer.
- 2) Explain real time operating system.
- 3) Explain control unit of computer with suitable diagram.



Seat No.	
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B.Sc. (ECS) (Part – I) (Semester – I) Examination, 2014
COMPUTER SCIENCE (Old)
Programming Using ‘C’ – I (Paper – II)

Day and Date : Monday, 3-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose correct alternatives : 10

- 1) C is a case sensitive language.
a) True b) False
- 2) Linker is used to create executable code file with extension .exe.
a) True b) False
- 3) A _____ statement is a sequence of two or more number of statements and enclosed inside the braces [{ }].
a) Conditional b) Sequential
c) Compound d) None
- 4) What is o/p of following program ?

```
Main ( )  
{  
  
    double x = 1/2.0 - 1/2;  
  
    printf ( " x = % .2f \n", x ) ;  
  
}
```

- a) x = 0.00 b) x = 0.25
- c) x = 0.50 d) x = 1.00



5) How many x are printed ?

For (i = 0, j = 10; i < j ; i ++, j --)

printf ("x") ;

- a) 10 b) 5 c) 4 d) none

6) The array elements are represented by _____

- a) index value b) subscripted value
c) array name d) size of an array

7) Main() function is user defined function

- a) True b) False

8) The gets () is available in _____ header file.

- a) <stdio.h> b) <conio.h>
c) <math.h> d) <string.h>

9) _____ is a fundamental data type in C language.

- a) array b) char
c) enum d) typedef

10) By default a real number is treated as _____

- a) float b) double
c) long double d) int

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

10

- 1) State difference between character constant and string constant.
- 2) What is loop ? List the looping statements.
- 3) Explain the terms compiler and interpreter.
- 4) State the applications of 'C' language.
- 5) What is the use of goto statement ?
- 6) How symbolic constant is defined ?



3. A) Answer **any two** of the following : **6**
- 1) Write a algorithm to calculate factorial of any number.
 - 2) Explain nested for loop with example.
 - 3) Explain size of operator with example.
- B) Write a program to calculate area and perimeter of circle. **4**
4. Answer **any two** of the following : **10**
- 1) What is flowchart ? Design flowchart for find out digit sum of given number.
 - 2) What is constant ? Explain types of constant.
 - 3) Write a program to find out sum of 1st five perfect number.
5. Answer **any two** of the following : **10**
- 1) What is data type ? Explain data types used in 'C' language.
 - 2) Write a program to calculate multiplication of two matrix.
 - 3) Explain control statements with example.
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Seat No.	
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B.Sc. (ECS) – I (Sem. – I) Examination, 2014
ELECTRONICS
Linear Electronics – I (Paper – III) (Old)

Day and Date : Wednesday, 5-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

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

1. Choose correct alternative.

10

- 1) A semiconductor has generally _____ valence electrons.
a) 2 b) 8 c) 4
- 2) When a pure semiconductor is heated its resistance _____
a) goes up b) goes down c) remains the same
- 3) The leakage current in a pn junction is of the order of _____
a) A b) mA c) μ A
- 4) A zener diode is always _____ connected.
a) reverse b) forward c) either reverse or forward
- 5) The main function of a capacitor is to _____
a) block current flow b) help current flow c) store energy
- 6) A potentiometer is used for changing the value of voltage whereas a rheostat is used for changing _____
a) current b) voltage c) capacitance
- 7) The color printed on resistor are yellow, green and black the value of resistor is _____
a) 45Ω b) 450Ω c) 4.5Ω
- 8) Barrier potential _____ with increase in junction temperature.
a) Decreases b) Constant c) Increases

P.T.O.



9) The property of the coil to oppose change in the _____ is called an inductance.

- a) current b) voltage c) frequency

10) Ripple factor for centre tapped full wave rectifier is _____

- a) 48 b) 4.8 d) 0.48

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

10

- 1) State and explain Ohm's law.
- 2) Define intrinsic and extrinsic semiconductor.
- 3) When $\alpha = 0.98$ then calculate β ?
- 4) Define Knee voltage and breakdown voltage in diode.
- 5) What is function of filter in rectifier ?
- 6) Draw diagram of bridge rectifier.

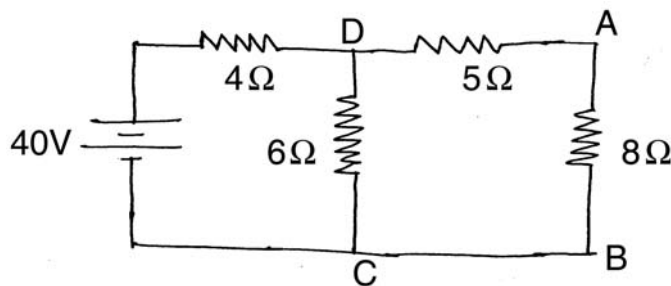
3. A) Attempt **any two** of the following :

6

- 1) Explain dc load line.
- 2) Explain zener diode as voltage regulator.
- 3) Explain IC 7805 and 7905.

B) Using Norton's theorem calculate current flowing through 8Ω resistor.

4



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

10

- 1) Explain working of N-P-N transistor.
- 2) Define resistor. Explain any two types of fixed resistor.
- 3) State and explain Thevenin's theorem.

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

10

- 1) Explain voltage divider biasing method of transistor.
- 2) Explain energy band description of conductors, semiconductors and insulators.
- 3) Explain working of photoconductor with diagram.



Seat No.	
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B.Sc. (ECS) – I (Semester – I) Examination, 2014
ELECTRONICS (Paper – IV) (Old)
Digital Electronics – I

Day and Date : Friday, 7-11-2014
Time : 3.00 p.m. to 5.00 p.m.

Max. Marks : 50

- Instructions:** i) **All questions are compulsory and carry equal marks.**
ii) **Draw neat diagram wherever necessary.**
iii) **Any type of calculator allowed.**

1. Fill in the blanks with correct alternative and rewrite : 10

- 1) The decimal equivalent of octal number 56 is _____
a) 46 b) 66 c) 53 d) 49
- 2) The decimal 8 in excess-3 code is given by _____
a) 1011 b) 1100 c) 1111 d) 1000
- 3) In the following code, successive code characters differ in only one bit position _____
a) BCD code b) Gray code
c) Excess-3 code d) Cyclic code
- 4) The hexadecimal equivalent of decimal 1000 is _____
a) 3E8 b) 4E8 c) 3CF d) None of these
- 5) The result of binary subtraction $(1101) - (1011)_2$ is given by _____
a) 0011 b) 0100 c) 0010 d) 0101
- 6) $A\bar{B} + \bar{A}B = D$ represents _____
a) OR gate b) EX-OR gate
c) Equivalence gate d) NOR gate
- 7) Which of the following Boolean algebra rules is correct ?
a) $A \cdot \bar{A} = 1$ b) $A + A \cdot B = A + B$
c) $A + \bar{A} \cdot B = A + B$ d) $A(A + B) = B$

P.T.O.

