Seat No.	

M.Sc. (Electronic Science) (Semester – I) (New) (CBCS) Examination, 2017
COMMUNICATION SYSTEM

Day & Date: Saturday, 22-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Attempt **five** questions.*
*2) Q **(1)** and **(2)** are **compulsory.***
*3) Attempt **any three** from Q.**3** to Q.**7**.*
4) Use of non programmable calculator.

Q.1 A) Choose the most correct alternative: **08**

1) The most suitable method for detecting a modulated signal $g(t)=(3 \text{ to } \cos 2Xf_m t) \cos 2Xf_c t$ is
   a) Envelope detector b) Synchronous detector
   c) Ratio detector d) Both a and b

2) When the number of quantising levels is 16 in PCM, the number of pulses in a code group will be _____.
   a) 3 b) 4 c) 8 d) 16

3) 24 telephone channels are frequency division multiplexed using an SSB modulation. Assuming 3 kHz frequency per channel, the required band width is …….
   a) 8 kHz b) 27 KHz c) 21 KHz d) 72 KHz.

4) A 1000 kHz carrier is simultaneously modulated by 300 Hz and 2 kHz audio sine wave. Which of the following frequency will not be present in the output?
   a) 998 kHz b) 999.7 kHz c) 1000.3 kHz d) 700 kHz

5) In an FM signal, the modulating frequency is 2KHz and maximum deviation is 10KHz. The bandwidth requirement is _____.
   a) 2 kHz b) 10 kHz c) 5 kHz d) 32 kHz

6) Noise can be measured by _____.
   a) D.C. voltmeter b) A.C. voltmeter
   c) Either of the above d) None of the above

7) In TV transmitter, the function of duplexer is _____.
   a) To amplify video signal
   b) To remove distortions in audio signal
   c) To combine outputs of visual and audio transmitters
   d) To amplify audio signal

8) A 400 w carrier amplitude modulated with m=0.75. The total power in AM is _____.
   a) 400 W b) 512W c) 588W d) 650W

Q.1 B) State **Truth/False** **06**

1) To separate channels in FDM receiver we have to use Band pass filter.
2) An angle modulated signal is given by $s(t) = \cos 2\pi (2 \times 10^6 t + 30 \sin 150t + 40 \cos 150t)$. The maximum frequency and phase deviation of s(t) are 7.5 KHz and 100 p rad.
3) In a 100% amplitude modulated signal, the power in the upper sideband when carrier power is to be 100 W and modulation system SSBSC. is 50W.
4) For attenuation of low frequencies we should use series capacitance.
5) The simplest method of suppression of unwanted side band in AM is filter method.
6) 24 telephone channels are frequency division multiplexed using an SSB modulation. Assuming 3 kHz per channel, the required band width is 21 KHz.

Q.2 Attempt the following: **14**

a) Discuss the operation of Class B power amplifier. **05**
b) Differentiate between TDM and FDM **05**
c) Explain about RZ and NRZ codes. **04**

Q.3 A) Explain the block diagram of low level modulated AM transmitter. **08**
B) Draw the block diagram of AM receiver and explain each block. **06**

Q.4 A) Explain the demodulation of an FM signal using dual slope detector. **08**
B) Explain the block diagram of PLL. **06**

Q.5 A) Explain how cross talk can be eliminated in TDM. **08**
B) Differentiate between PAM, PWM and PPM. **06**

Q.6 A) Explain the modulation technique of BPSK signal. **08**
B) Discuss in brief the various transmission modes. **06**

Q.7 A) Explain the acquisition of a DS signal. **08**
B) What is CDMA? Explain in detail.

Seat No.	

M.Sc. (Electronic Science)(Semester – I)(Old) (CBCS) Examination, 2017
MICROPROCESSORS AND MICROCONTROLLERS

Day & Date: Thursday, 20-04-2017 Max. Marks: 70

Time: 10:30 AM to 01.00 PM

N.B. : *1) Q. No.* ***(1), (2)*** *and* ***(6)*** *are compulsory.*
2) Attempt ***any three*** *from Q. No. (3), (7)*
3) All questions ***carry*** *equal marks.*
4) ***Use*** *of non programmable* ***calculator*** *is allowed.*

Q.1 a) Select the most correct alternative: 08

1. Which of the following instruction is an example of the direct addressing mode?
   a) MOV A, @R0 b) MOV R0, #10H
   c) MOV 10H, A d) MOV R5, A

2. Which instruction cannot force the 8086 processor out of 'halt' state?
   a) Interrupt request b) Reset
   c) Hold d) Both a and b

3. 8086 can access up to _____ memory locations.
   a) 2MB b) 1 MB
   c) 4 MB d) 8 MB

4. The 8086 has _____ queue pipelined architecture.
   a) 4 byte b) 4 bit
   c) 8 byte d) 16 bit

5. Which command enables the PIC microcontroller to enter into the power down mode during operation of watching timer (WDT)?
   a) SLEEP b) RESET
   c) STATUS d) CLR

6. Which operational feature of PIC allows it to reset especially when the power supply drops the voltage below 4 V?
   a) Built-in Power-on-reset b) Brown-out-reset
   c) Both a & b d) None of the above

7. PIC microcontroller has _____ address bus for data Memory.
   a) 32 bytes b) 8 bytes
   c) 12 bit d) 128 bytes

8. In 8086, BIU prefetches the instruction from memory and store them in ____.
   a) Stack b) Register
   c) Memory d) Queue

b) State true or false: **06**

1. Physical address in 8086 microprocessor is the 20 bit address.
2. The 8086 has external clock generator.
3. In minimum mode operation of 8086 microprocessor, the control signals are issued by the 8288 bus controller.
4. The PIC microcontroller has Harvard architecture.
5. The PICI 18 contains a program stack that stores up to 41 return addresses.
6. Polling interrupt in microcontroller can continuously monitor the status of a given device.

Q.2 Answer the following. **14**

a) Explain the interrupts of a PIC microcontroller. **05**

b) Briefly explain the minimum mode configuration of 8086. **05**

c) List the features of PIC 18FXXXX microcontroller. **04**

Q.3 a) Explain the addressing modes of 8086 with the help of examples? **10**

b) Write an ALP in 8086 to find a sum of numbers in array? **04**

Q.4 a) Explain the branching and looping instructions in 8086 with suitable example for each. **10**

b) Describe any four assembler directives used in 8086 assembly language programming. **04**

Q.5 a) Draw and explain the pin configuration of 8086 and explain the function of each. **10**

b) Write an assembly language program for multiplication of 16- bit number using 8086 instructions. **04**

Q.6 a) Give a detailed account of the architecture of PIC microcontroller. **10**

b) Write a note on overview & features of PIC 18F microcontroller. **04**

Q.7 a) Interface a smart LCD to PIC microcontroller. Write the ALP for interfacing. **10**

b) Explain the watchdog timer of PIC microcontroller. **04**

Seat No.	

M. Sc.(Electronic Science) (Semester – I)(Old CBCS) Examination, 2017
COMMUNICATION SYSTEMS

Day & Date: Saturday, 22-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Questions **NO.1** and **2** are **Compulsory.***
*2) Answer **any three** questions from **Q.NO.3** to **Q.NO.7***
*3) All questions **carry** equal marks.*
*4) Use of non programmable **calculator** is allowed.*

Q.1 A) Select the most correct alternative. **08**

1) Demodulation is done in _____.
   a) Receiving antenna b) Transmitter
   c) Radio receiver d) Transmitting antenna

2) CDMA technology in inherently resistant to _____.
   a) Interference b) Jamming
   c) Both a & b d) None of the above

3) In TV transmission, sound signal is _____ modulated.
   a) Amplitude b) Frequency
   c) Phase d) None of the above

4) Which of the following noise does not occur in transistors?
   a) Partition noise b) Shot noise
   c) Flicker noise d) Resistance noise

5) The Intermediate frequency is 455 kHz. If the radio receiver is tuned to 885 kHz, then local oscillator frequency is ____.
   a) 455 kHz b) 1310 kHz
   c) 1500 kHz d) 1520 kHz

6) The standard value for intermediate frequency (IF) in AM receivers is _____
   a) 455 KHz b) 580 KHz
   c) 10.7 MHz d) 50 MHz

7) For telegraphy, the most commonly used modulation system is _____.
   a) PCM b) FSK
   c) ASK d) Single tone modulation

8) DSSS technique expands band width of a signal by replacing each data bit with _____.
   a) n+1 bits b) n-1 bits
   c) n bits d) both a and c

B) State True/False: **06**

1) As the modulation level is increased, the carrier power remains the same.
2) The polarities in RZ format uses the complete pulse duration.
3) A buffer amplifier acts as a high gain ac amplifier.
4) In pulse code modulation system, a large bandwidth is required.
5) In CDMA, the bit rate of the digital data is called chipping frequency.
6) A high Q tuned circuit will permit an emplifier to have high selectivity.

Q.2 Answer the following: **14**

1) Explain the Phase shift keying with its waveforms. **05**
2) Briefly explain the sampling theorem. **05**
3) What are the advantages of single side band transmission? **04**

Q.3 a) Draw and explain circuit diagram of dual slope detector. **08**
b) Explain Cross talk in TDM. **06**

Q.4 a) Describe with a suitable circuit diagram and waveforms of single transistor low level (emitter) AM Modulator. **10**
b) What is delta modulation? **04**

Q.5 a) Sketch the block diagram of F.M. receiver and explain. **10**
b) Differentiate between FDM and TDM. **04**

Q.6 a) Explain how PWM and PPM signals are generated? **10**
b) What is the frequency hopping spread spectrum technique? **04**

Q.7 a) Discuss a Class B audio amplifier. **08**
b) Draw the NRZ and RZ code for the digital data 10110001. **06**

SLR-RH – 366

Seat No.	

M.Sc. (Electronic Science) (Semester –II) (New) (CBCS) Examination, 2017
CONTROL SYSTEMS

Day & Date: Wednesday19-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1)* ***Q.(1) and (2)*** *are* ***compulsory.***
2) Answer any ***three*** *questions from* ***Q.3 to Q.7****.*
3) All questions carry ***equal*** *marks.*
4) Use of nonprogrammable calculator is allowed.

Q.1 A) Select the correct alternative **08**

1) The input to a controller is_____.
   a) Sensed signal b) Desired variable value
   c) Error signal d) Servo-signal

2) The laplace transform of unit step signal is _____.
   a) 1/s b) 1 c) $1/s^2$ d) $1/s^3$

3) Two loops are said to be non-touching only if no common _____ exists between them.
   a) Loop b) Feedback path c) Branch d) Node

4) While specifying the angle and magnitude conditions, angles are added whereas magnitudes get_____.
   a) Subtracted b) Multiplied
   c) Divided d) All of the above

5) If any root of the characteristic equation has a positive real part, the system is_____.
   a) Stable b) Unstable
   c) Oscillatory d) Conditionally stable

6) _____ system has tendency to oscillate.
   a) Open loop system b) Closed loop system
   c) Both a and b d) Neither a and b

7) Controller with a proportional term and a derivative term is called_____ controller.
   a) PI b) P c) PD d) PID

8) When two blocks are connected in series, the transfer functions are to be_____.
   a) Added b) Subtracted
   c) Multiplied d) Divided

B) Say true or false. **6**

1) A refrigerator is an example of closed loop system.
2) Transfer function is applicable to linear time-variant system.
3) Frequency response of a system is the steady state response to a unit step input signal.
4) A compensating network is added to alter the locus of the roots as the system parameter is varied.
5) Root locus technique is applicable to single as well as multiple loop system.
6) DC servomotors are also called two phase induction motors.

Q.2 Attempt the following. **14**

1) Explain the terms utilized in signal flow graph. **05**
2) Write a short note on on-off controller. **05**
3) Briefly describe the concept of stability. **04**

Q.3 a) Draw a block diagram of closed loop system and an expression for its transfer function. **08**

b) Derive an expression for transfer function using LTI differential equation. **06**

Q4 a) Find the gain of the system represented by the following equations. **08**

$X_2 = a_{22}\, x_1 + a_{32}\, x_3$

$X_3 = a_{23}\, x_2 + a_{34}\, x_4$

$X_4 = a_{24}\, x_2 + a_{34}\, x_3 + a_{44}\, x_4$

$X_5 = a_{25}\, x_2 + a_{45}\, x_4$

Here, the input node is x_1 and output node is x_5.

b) What is signal flow graph? Explain mason's gain formula. **06**

Q5 a) Consider the system with G(S). H(S) = K/S(S+2) (S+4)and S=-1.21 confirmed to be on the root locus. Determine at what value of k, S=-1.21 is one of the roots of 1+G(s). H(s). use magnitude condition. **08**

b) Explain the stability of given equation using Hurwitz method. **06**

$S^3 + 4S^2 + 3S + 8 = 0$

Q.6 a) Obtain gain margin and phase margin for the loop transfer function using Bode plot. **08**

G(s) H(s)=80/s (1+s/50)(1+s/20)

b) Explain state model from transfer function using direct method. **06**

Q.7 a) Design and explain a PI controller. Mention its advantages and disadvantage? **08**

b) Draw and explain the working of potentiometer error detector and represent in block diagram form. **06**

SLR-RH– 367

Seat No.	

M.Sc.(Electronic Science)(Semester – II) (New)(CBCS) Examination, 2017
Digital Electronic of VHDL (HCT 2.2)

Day & Date: Friday, 21-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Q.(1)and(2) are compulsory.*
2) Answer any three questions from Q3 to Q.7.
3) All questions carry equal marks.
4) Use of nonprogrammable calculator is allowed.

Q.1 A) Select the correct alternative: **08**

1) The beginning and end of a loop in a Verilog is defined as ____
   a) Begin---end b) Curly brackets ()
   c) None of these d) Both a and b

2) Verilog supports _____dimensional array of registers, integers, nets or times.
   a) One b) Two c) Three d) Both a and b

3) The _____condition statement is used to make a decision whether a statement is executed or not.
   a) while b) If-else c) for d) repeat

4) How many flip –flops are required to produce a divide –by-256 device?
   a) 1 b) 4 c) 8 d) 7

5) The high impedance state or floating state in verilog is _____.
   a) 1 b) X c) Z d) Both X and Z

6) How many stable state/ states present in flip-flop?
   a) 2 b) 3 c) 0 d) 4

7) Once a PAL has been programmed _____.
   a) It cannot be reprogrammed
   b) Its output are only active HIGH
   c) Its outputs are only active LOW
   d) its Logic capacity is lost

8) In Tb flip-flop when state of T flip-flop has to be complemented, T must be_____.
   a) 0 b) 1 c) T d) T+1

Q.1 B) State True or False: **06**

1) Verilog is case sensitive.
2) A combinational logic circuit is one whose output depends on current as well past input
3) Modules communicate with external world using ports.
4) Verilog synthesizers with the white space ' ' and carriage returns differently.
5) Data flow modeling is low level of abstraction as compared to behavioral modeling.
6) Flip-flop stores I – bit information.

Q.2 Attempt the followings.

a) With a neat block diagram, explain Mealy and MOORE models. **05**
b) Design half adder and draw its truth table. **05**
c) Compare: encoder and decoder. **04**

Q.3 a) Design Carry look ahead adder and draw its logic diagram. **08**
b) Distinguish between tasks and functions. **06**

Q.4 a) Design 4-bit Johnson counter using J-K flip flop with its timing diagram. **08**
b) Explain state table reduction and state assignment technique using the state table given below. **14**

06

Present State	Next State		Output(Z)	
	Input (x)		Input (x)	
	X=0	X=1	X=0	X=1
A	A	B	0	0
B	D	C	0	1
C	F	E	0	0
D	D	F	0	1
E	B	G	0	0
F	G	C	0	1
G	A	F	0	0

Q.5 a) Write a Verilog code for the following using behavioral modeling style. **10**
i) 3:8 decoder
ii) 4-bit binary adder
b) Write a Verilog code for 4:1 multiplexer using case statement. **04**

Q.6 a) Explain in detail operators in Verilog. **08**
b) Design a PLA to realize the following three logic function and show the internal connections. **06**

f_1 (A,B,C,D,E)= A'.B'.D'+B'.C.D'+A'.B.C.D.E'
f_2(A,B,C,D,E)= A'.B.E + B'.C.D'.E
f_3(A,B,C,D,E)= A'.B'.D'+B'.C'.D'.E+A'.B.C.D

Q.7 a) What is FPGA? Explainthe working of its different blocks with a neat diagram. **08**

b) Write a Verilog HDL code for S-R flip-flop using gate level modeling **06**

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Seat No.	

M.Sc. (Electronic Science) (Semester-II) New (CBCS) Examination, 2017
PIC Microcontroller

Day & Date: Monday, 24-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

Instructions : *1) Questions **NO.1** and **2** are **Compulsory.***
2) Question 1 and 2 are compulsory.
3) Attempt any three from Q.3 to Q.
4) Figures to the right indicate full marks.
5) Use of non programmable calculator is allowed.

Q.1 A) Select correct alternative **8**

1) PIC18 Fxxxx is……. Microcontroller.
   A) RISK B) CISK
   C) RISC D) CISC

2) …… is true about PIC microcontroller.
   a) It is an 8-bit microcontroller
   b) It has Harvard architecture
   c) It is a RISC CPU
   d) All the these

3) Most PORT pins of PIC microcontroller can source/sink…… mA current.
   a) 1 b) 0.5
   c) 25 d) 100

4) What is the operating frequency range of HS clocking configuration when crystal is used as a clock source?
   a) 5-200 KHz b) 100 KHz – 4 MHz
   c) 0-4 MHz d) 4-20 MHz

5) …… instruction / instructions clear the watchdog timer of PIC.
   a) CLEAR b) CLRWDT
   c) SLEEP d) Both b and c

6) PIC microcontrollers CALL instruction takes ……. Machine cycles to execute.
   a) 1 b) 2
   c) 4 d) 8

7) …….. device use MISO/MOS1 pins.
   a) RS232 b) 1^2C
   c) SPI d) All of these

8) The address of 'row 2 column 1' character of 16*2 LCD is…..
   a) 80h b) 88H
   c) C0h d) FFhs

B) State TRUE or FALSE **6**

1) PICI8Fxxxx microcontrollers have a-21-bit program counter.
2) GOTO is an unconditional jump instruction.
3) PIC port pins cannot drive LED directly.
4) PIC microcontroller is reset by holding the MCLR pin LOW.
5) The PIC microcontroller will enter in Brown-our Reset when VDD rises above VBOR.
6) I^2C is a serial protocol for one-wire interface between PIC microcontroller and peripherals.

Q2 **Give a brief account of**

a) Features of simulator in MPLAB IDE. **5**
b) Explain the use of watchdog timer. **5**
c) Compare DC motor with stepper motor. **4**

Q3

a) Explain memory organization in PIC microcontroller. **8**
b) Write a program to generate square wave on all PORTB pins. **6**

Q4

a) Explain bit-oriented operations in PIC microcontroller with suitable example program. **8**
b) Explain rotate instructions of PIC microcontroller with suitable examples. **6**

Q5

a) Give a brief overview of clock sources in PIC18Fxxxx microcontroller. **10**
b) Write a short note on CCP module of PIC microcontroller. **4**

Q6

a) Explain how to interface : i) LED, ii) relay, iii) Single push button, and iv) opt coupler with PIC microcontroller. **8**
b) Explain C protocol. **6**

Q7

a) Draw schematic of interfacing sensor LM35 and write a program to display the temperature using PIC microcontroller. **8**
b) Interface 16*2 LCD display with PIC microcontroller and write a program to display "temperature" on the LCD on second line. **6**

SLR-RH – 370

Seat No.	

M. Sc Electronics (Communication Science) (Semester – II) (Old)
(CBCS) Examination, 2017
MODERN ANTENNA DESING

Day & Date: Wednesday, 19-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Questions **NO.1** and **2** are **Compulsory.***
*2) Answer **any three** questions from **Q.NO.3** to **Q.NO.7***
*3) All questions **carry** equal marks.*

Q.1 Objective Questions. **14**

A) Choose the correct alternative given in the bracket. **06**

1) An antenna have radiation resistance 73 Ω and its total ohmic loss resistance is 7Ω its efficiency is
   a) 81% b) 91% c) 71% d) None

2) Dipole antenna has maximum radiation in a plane.
   a) Normal to the axis b) Both
   c) Far field region d) None

3) Fresnel field region is also called _____ region.
   a) Reactive near field b) Radiating near field
   c) Far field region d) None of the above

4) Which of the following is non uniform amplitude array
   a) Broad side b) End fire
   c) Binomial d) Harsen and wood yard

5) The advantage of the offset feed system is
   a) Avoid aperture blocking b) Reduction in spill over
   c) Increase in spill over d) None

6) Front fed parabolic reflectors suffer due to
   a) Aperture blocking b) Both
   c) Mismatch in main feed d) None

B) State True/False **08**

1) Power pattern is half of the field pattern.
2) Beam area of a radiator is inversely proportional to the total radiated power.
3) The vertical plane pattern of short dipoles and half wave dipole is dumbbell.
4) Linear antennas are straight thin wire radiators.
5) Half wave dipole is derived from the $\lambda/2$.
6) Total charge in the array phase function $\psi\ is\ 2\beta d$
7) Resonant antenna carries current of standing wave.

8) In lens antennas the spherical wave to plane wav is front is achieved based on principle of Reflection.

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Q.2 Answer the following: **14**

1) State some applications of folded dipoles. **05**
2) Discuss patch antenna. Write down the advantages. **04**
3) What are radiation pattern F/B ratio? **05**

Q.3 Answer the following: **14**

1) Write a suitable diagram, the construction and operation of a Yagi antenna. **10**
2) If the effective height of an aerial is $1/150^{th}$ of the wave emitted determine its radiations resistance. **04**

Q4 Answer the following: **14**

1) Derive the expression for relation between current and charge of single wire. What are different conditions while radiation is possible in single wire? **08**
2) Explain Beam width of major lode **06**

Q.5 Answer the following: **14**

1) Describe the parabolic reflector used at micro frequencies? **08**
2) Write short notes on Luneburg lens? **06**

Q.6 Answer the following: **14**

1) Define radiation intensity. The radial component of the radiated power density is given by, $W_{rad} = a_r W_r = a_r A_0 \sin\theta / r^2 (W/m^2)$. **08**
2) Differentiate broad side End fire array? **06**

Q.7 Answer the following: **14**

A) Write detailed notes on **10**
   1) Parabolic reflectors
   2) Log periodic antennas

B) Write a note on effective aperture of the antenna **04**

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Seat No.	

M.Sc. (Electronic)(Semester – II) (Old) (CBCS) Examination, 2017
Microwave Engineering (Paper VI)

Day & Date: Friday, 21-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Question number 1, 2 and 6 are compulsory.*
*2) Attempt **<u>any three</u>** from questions number 3 to 7.*
3) All questions carry equal marks.
4) Use of nonprogrammable calculator is allowed.

Q.1 A) Select the correct alternatives. **08**

1) In a circular waveguide, the dominate mode is _____
   a) TE_{01} b) TE_{11} c) TE_{20} d) TE_{21}

2) C band in microwave region has _____frequency range.
   a) 4 to 8 GHz b) 18 to 26 GHz
   c) 8 to 12 GHz d) 26 to 40 GHz

3) The reflection coefficient on a line is $0.2 \angle 45^0$. The SWR is ___
   a) 0.8 b) 1.1 c) 1.2 d) 1.5

4) Which of the following is not a travelling wave?
   a) $e = E_m \sin(\beta x - \omega t)$ b) $e = E_m \cos(\beta x - \omega t)$
   c) $e = E_m \sin(\omega t - \beta x)$ d) $e = E_m \sin(\beta x)$

5) Reflex Klystron is a _____
   a) Microwave amplifier
   b) Microwave oscillator
   c) Microwave passive device
   d) Microwave phase shifter

6) Which of the following parameters is negligible in transmission lines?
   a) R b) L c) G d) C

7) In case of open circuit transmission lines the reflection coefficient is
   a) 1 b) 0.5 c) -1 d) Zero

8) A waveguide section in microwave circuit acts as a _____
   a) Low pass filter b) Band pass filter
   c) High pass filter d) Band reject filter

B) State true or false. **06**

1) When transmission line is terminated to an open circuit, the

SWR is infinite.

2) Skin effect is more pronounced at high frequencies.
3) Reflex klystron is essentially a low power device.
4) TM_{10} mode in rectangular waveguide has lowest cutoff frequency.
5) The wavelength corresponding to a microwave frequency range is 3 to 30 GHz.
6) Gauss law is not applicable to the closed surface.

Q.2 Attempt the following.

1) Differentiate TWT from that of the klystron. **05**
2) Explain what do you mean by waveguide phase shifter. **05**
3) Mention the applications of microwaves. **04**

Q.3 A) Derive an expressions for cut off frequency and phase constant in a rectangular wave guide. **10**

B) What are strip lines? Mention their advantages over transmission lines. **04**

Q.4 A) A 600 MHz electromagnetic wave is propagating through a perfect nonmagnetic dielectrics having $\in_R = 6$. Calculate **08**

1) Wavelength and phase constant.
2) With wave travelling in the +z direction, the sinusoidal electric field at z=50cm is delayed relative to the fields at z=75cm. Calculate the time delay and the phase delay.
3) Calculate the average power density in the wave if the peak value of the magnetic field is 0.4A/m.

B) Give a brief note on matched loads. **06**

Q.5 A) Derive an expression for wave propagation in a perfect insulators. **10**

B) Explain lossy-line attenuator in a co-axial line. **04**

Q.6 A) Sketch and explain standard coaxial connectors. **10**

B) What is a Gunn effect? **04**

Q.7 A) With a neat circuit diagram and relevant equations, explain the velocity modulation process in a two cavity klystron. **10**

B) Write a short note on Microwave spectrum. **04**

Seat No.	

M. Sc Electronics (Communication Science) (Semester – II) (Old) (CBCS) Examination, 2017
ADVANCED MICROCONTROLLERS

Day & Date: Monday, 24-04-2017 Max. Marks: 70

Time: 10.30 AM to 01.00 PM

N.B. : *1) Questions **NO.1** and **2** are **Compulsory.***
*2) Answer **any three** questions from **Q.NO.3** to **Q.NO.7***
*3) All questions **carry** equal marks.*

Q.1 Objective Questions. **14**

A) Choose the correct alternative given in the bracket. **6**

1) In data indirect with displacement mode, the maximum displacement added to the pointer is _____ bit.
a) 2 b) 6 c) 8 d) 16

2) For LPM instruction, constant byte address is specified by _____ register.
a) X b) Y c) z d) Any of these

3) The AVR ALU does not support arithmetic and logic operation between _____.
a) Between a constant and a register b) Registers
c) Between a memory and a register d) Both a and c

4) ARM920Tsupports _____ address.
a) Virtual Address b) Modified Virtual Address
c) Physical Address d) All of these

5) _____ register contains the control bits of the ARM920T.
a) Register 0 b) Register 1 c) Register 2 d) Register 3

6) The ARM9TDMI has a _____ stage pipeline design.
a) 3 b) 4 c) 5 d) 7

B) State True/False **08**

1) Most of AVR instructions have fixed 16-bit format.
2) AVR instruction SNF is used to set the negative flag.
3) Atmel's AVR microcontroller do not use pipeline.
4) AVR External Reset is generated by a high level on the RESET pin.
5) Internally, the ARM920Tclocked by signal BCLK.
6) SWI instruction allows a user mode program to request privileged operations from supervisor mode.
7) Increasing the block size of cache memory increases performance.
8) Interrupt stops execution of the instruction in middle, while it is being executed.

Q.2	**Write short notes:**	**14**
	1) Explain any two program control instructions of AVR with suitable examples.	**05**
	2) Give RISC features of ARM.	**05**
	3) How to switch between ARM and THUMB modes?	**04**
Q.3	1) Give a brief overview of AVR ports. Explain the steps in configuring port as an A) input and B) output	**10** **08**
	2) Write a short note on AVR flags,	**06**
Q.4	1) Explain memory organization of AVR microcontroller. With a neat diagram external SRAM interfacing with AVR microcontroller.	**10**
	2) Explain LPM instruction of AVR.	**04**
Q.5	1) Explain interrupt system of AVR.	**08**
	2) What is pipeline? Explain ARM pipeline.	**06**
Q.6	1) With a neat diagram explain ARM processor modes and associated register set.	**08**
	2) Write a short note on software interrupt in ARM.	**06**
Q.7	1) Explain 'Conditional Execution' feature of ARM.	**08**
	2) Give differences in ARM and THUMB modes of operation.	**06**

Seat No.	

M.Sc – Electronics (communication Science) (Semester – III) (Old) (CGPA) Examination, 2017
DIGITAL COMMUNICATION

Day & Date: Thursday, 20-04-2017 Max. Marks: 70

Time: 2:30 PM to 05.00 PM

N.B. : *1) Q. No.**(1)and** (2) are **compulsory.***
*2) Answer **any three** questions from **Q.3 to Q.7.***
***3)** All questions carry equal marks.*
***4) Use** of nonprogrammable **calculator** is allowed.*

Q.1 a) Select the most correct alternative: **08**

1. The square root of variance is called _____.
   a) Mean b) Random variable
   c) Standard deviation d) Correlation coefficient

2. Granular noise occurs when _____.
   a) Step size is too small b) Step size is too large
   c) Interference from the adjacent channel
   d) Bandwidth is too large

3. If minimum distance (d_{min}) is 3, means it detect up to _____ errors.
   a) 3 b) 2
   c) 1 d) 4

4. For a (7,4) block code, 7 is the total number of bits and 4 is the number of _____.
   a) Redundant bits b) Total bits-information bits
   c) Information bits d) None of the above

5. The sequence of operations in which PCM is done is.
   a) Sampling, quantizing, encoding
   b) Quantizing, encoding, sampling
   c) Quantizing, sampling, encoding
   d) Sampling, encoding, quantizing

6. In uniform quantization process the step size_____.
   a) Remains same
   b) Varies according to the input signal amplitude
   c) Varies according to the input signal phase
   d) Varies abruptly

7. The expected information contained in a message is called _____.

a) Entropy b) Efficiency c) Coded signal d) Decoded signal

8. Parity check bit coding is used for _____.
   a) Error correction b) Error detection
   c) Both a and b d) Name of the above

b) State true or false: **06**

1. DPCM requires larger bandwidth than PCM.
2. The practically used value of A-law companding is 255.
3. Compression of signal at transmitter and expansion at receiver is called combinely as companding.
4. Information rate is defined as information per unit time.
5. Probability density function (PDF) plays a role in describing a discrete random variable.
6. A random process X(t) is said to be stationary in the strict sense if its statics is not affected by a time shift.

Q.2 Answer the following. (any 3): **14**

a) Explain carrier synchronization. **05**

b) Write a short note on random process. **05**

c) What is a binary cyclic code? **04**

d) What is ergodicity? **04**

Q.3 a) With a neat block diagram, explain in brief a coherent BPSK system. **08**

b) State and explain Shannon- Hartly theorem. **06**

Q.4 a) What is a matched filter? Derive an expression for its output SNR. **08**

b) With the suitable derivation explain what do you mean by an optimum receiver. **06**

Q.5 a) Use Shannons encoding procedure for the following symbols and find the code efficiency. **08**

Symbol	S1	S2	S3	S4	S5
Probability	P1=0.4	P2=0.2	P3=0.2	P4=0.1	P5=0.1

b) An analog signal bandwidth limited to 10 KHz quantized states are 8 levels of PCM system with probability of ¼,1/5,1/5,1/10,1/20, and 1/20, respectively. Find the entropy and rate of information. **06**

Q.6 a) Explain the adaptive delta modulation (ADM) with a neat block diagram. **08**

b) Explain with an example what do you mean by non uniform quantization? **06**

Q.7 a) The generator polynomial of a (7,4) cyclic code is $g(X) = 1 + X + X^3$. Find out 16 code words of the above systems. **10**

b) Compare between DM and ADM systems. **04**

Seat No.	

M.Sc. (Electronic Science) (Semester–IV) (New)(CBCS) Examination, 2017
VLSI Design

Day & Date: Wednesday, 19-04-2017 Max. Marks: 70

Time: 02.30 PM to 05.00 PM

N.B. : *1) Q. 1 and Q.2 are **compulsory.***
*2) Attempt **any three** from Q.3 to Q.7*
3) All questions carry equal marks.
4) Use of nonprogrammable calculator is allowed.

Q.1 A) Choose the correct alternatives. **08**

1) _____are located at the intersection of the vertical and horizontal channels.

a) CLBs b) Switch boxes
c) Vertical connection box d) None of these

2) _____design is fully customized to highest performance and smallest size.

a) Semi custom b) Gate array c) Full custom d) FPGA

3) The carry generator in carry look ahead can be expressed using ____ gate

a) AND b) OR c) NOR d) XOR

4) The _____, of a cell is usually kept low to avoid driving problems.

a) Fanout b) fanin
c) input impedence d) all of the above

5) An antifuse is normally an open circuit until you force a programming current through it about _____mA.

a) 15 b) 5 c) Less than 15 b) Greater than 15

6) In CMOS circuits, which type of power dissipation occurs due to switching of transient current and charging & discharging of load capacitance?

a) Dynamic dissipation b) Static dissipation
c) Both a and b d) None of these

7) In 3:8 decoder the number of inputs are_____

a) 2 b) 1 c) 8 d) 3

8) CMOS operates more reliably than TTL in a high-noise environment because of its_____

a) Lower noise margin b) Smaller power dissipation
c) High input impedance d) Higher noise margin

B) State true or false. **06**

1) A Transmission Gate (TG) is a complementary CMOS switch.
2) In dynamic logic the second phase, when Clock is high, is called the setup phase.
3) Gate array implementation requires a two-step manufacturing process.
4) We write indices of logic cell in ascending order.
5) To compensate, we make the shape factor, (W/L) of the p-channel Transistor in an inverter about twice that of the n – channel transistor.
6) Use heavy lines ((1.5 point wide) with a stroke to denote a data bus and regular lines (0.5 point) to denote the control signals.

Q.2 Answer the following: **14**

A) Write a note on a shift register **05**
B) Explain standard cell based design **05**
C) CMOS inverter logic structure **04**
D) Design a one bit magnitude comparator. **04**

Q.3 A) What do you mean by logic cell? Explain the sequential logic cell in detail. **08**
B) Explain ASIC design flow. **06**

Q.4 A) What are the implementation strategies for digital ICs? Explain semi custom design style in brief. **08**
B) Explain the datapath logic cell. **06**

Q.5 A) Explain briefly the DC analysis and voltage transfer characteristics of CMOS inverter. **08**
B) Distinguish between dynamic and static CMOS. **06**

Q.6 A) What is the difference between fuse and antifuse? Explain antifuse in detail. **08**
B) What is a decoder? Design 3 to 8 line decoder. **06**

Q.7 A) Explain in detail the super MOS transistor. **08**
B) Explain NMOS inverter. **06**

Seat No.	

M.Sc. (Electronics Science) (Semester – IV) (New) (CBCS) Examination, 2017

MOBILE COMMUNICATION

Day & Date: Friday, 21-04-2017 Max. Marks: 70

Time: 02.30 PM to 05.00 PM

N.B. : *1)* ***Question*** *number* ***1, 2*** *and 6 are* ***compulsory****.*
2) Attempt ***any three*** from *questions number* ***3 to 7.***
3) All questions ***carry*** *equal* ***marks****.*
4) Use of nonprogrammable ***calculator*** *is* ***allowed****.*

Q.1 A) Select the correct alternatives. **08**

1) The access point (AP) in the wireless is equivalent to _____in a wired LAN.
a) Switch b) Repeater c) Hub d) Gateway

2) _____code is used for error detection.
a) CRC b) Hamming c) Huffman d) Convolution

3) Maximum synchronization channels on a forward CDMA link are _____
a) 0 b) 1 c) 7 d) 8

4) The mechanism used in Indirect-TCP is _____
a) Split TCP connection into two
b) Split TCP connections, choke sender
c) Snoop data
d) Snoops data and acknowledgement

5) _____is a mechanism as taking a packet consisting of packet header and data pushing it into the data part of a new packet.
a) Decapsulation b) Encapsulation
c) Synchronous d) Asynchronous

6) Which among the following is a license free band?
a) ISM b) GSM c) CDMA d) AMPS

7) If two or more stations access the medium at the _____collision occurs.
a) Same time b) Different time
c) Any time d) Both b and c

8) What is CDMA digital cellular standard?
a) IS-95 b) IS-96 c) IS-59 d) Both a and c

B) State true or false. **06**

1) DHCP is based on client-server model.
2) In CDMA, channel is orthogonal code.
3) A Bluetooth operates at 2 GHz band.
4) TDMA is an example of continuous transmission scheme.
5) Encapsulation is the mechanism of taking packet and putting it into the data part of a new packet.
6) The main advantage of infra red technology is wider bandwidth.

Q.2 Attempt the following. (any 3) **14**

1) Explain the need and applications of wireless communication. **05**
2) Explain the infrastructure network with suitable diagram. **05**
3) Mention the advantage of WLAN. **04**
4) What is selective retransmission and recovery? **04**

Q.3 A) Explain cellular system operation and planning in detail. **08**

B) Briefly explain multiple access technologies or cellular systems. **06**

Q.4 A) Explain IS-95 CDMA network with its forward and reverse channel mechanisms. **10**

B) Explain WATM services. **04**

Q.5 A) Describe Traditional TCP in detail and point out its different mechanism. **10**

B) Explain handover of WATM. **04**

Q.6 A) Explain IP packet delivery mechanism in model IP. **08**

B) Explain in brief DHCP. **06**

Q.7 A) Explain format of an IEEE 802.11 physical frame using DSSS and FHSS techniques. **10**

B) Explain bluetooth referred to its advantages and disadvantages. **04**

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Seat No.	

M.Sc.- (Electronics Science) (Semester-IV) (New) (CBCS) Examination, 2017
FIBER OPTIC COMMUNICATION

Day & Date: Monday, 24-04-2017 Max. Marks: 70

Time: 02.30 PM to 05.00 PM

Instructions : 1) *Q.(1) and (2) are compulsory.*
2) Answer any three questions from Q.3 to Q.7
3) All questions carry equal marks.
4) Use of nonprogrammable calculator is allowed.

Q.1 A) Select the most correct alternative **06**

1) Stimulated emission occur when the following condition is satisfied……
   A) $E_{fc} - E_{fv} = 0$ B) $E_{fc} - E_{fv} > E_g$
   C) $hf > E_g$ D) $E_{fc} - E_{fv} > hf > E_g$

2) The drawback with LED is……..
   a) Low optical power coupled into a fiber
   b) Usually lower modulated bandwidth
   c) Harmonic distortion
   d) All the above

3) The response of avalanche photo diode is limited by……..
   A) The transit time of the carrier across the absorption region.
   B) Diffusion time of carrier
   C) None of above
   D) All the above

4) The ray of light that passes through the axis of a fiber optic is called as……..
   A) Accepted ray B) Meriditional ray
   C) Critical ray D) None of these.

5) The OTDM stands for……..
   A) Orthogonal time duplex multiplexing
   B) Optical time duplex multiplexing
   C) Orthogonal time division multiplexing
   D) Optical time division multiplexing.

6) In optical cable design the strain on the fiber in cable does not exceed…….
   a) 0.2% b) 2.2% c) 0.8% d) 5%

B) State TRUE or FALSE **08**

1) The Mid-infrared range used for optical transmissions is 0.8 to 1.55 μm
2) A ray of light travels more slowly in an optical dense medium than in one that is less dense.
3) SBS (Stimulated Brilloum scattering) is mainly a backward process.
4) For an acceptance angle of 300^0, numerical aperture should be 0.8666.
5) The internal quantum efficiency of LED decreases with decrease in temperature.
6) Surface emitting LED offers constant spectral line width.
7) Demodulation means receiving information
8) Semiconductor photodiode without internal gain generate two electron-hole pairs per absorbed photon.

Q2 Write a short notes.

a) Explain Advantages and disadvantages of optical fibers? **05**

b) Explain the different types of scattering mechanisms in optical fiber? **05**

c) Explain the benefits and drawbacks of avalanche photodiode? **04**

Q3 a) When the mean optical power launched into an 8KM length of fiber is 120μW, the mean optical power at the fiber output is 3 μW. Calculate **08**

i) The overall signal attenuation or loss in decibels through the fiber assuming there are no connectors or splice.
ii) The signal attenuation per KM
iii) The overall attenuation for a 10KM optical link using the same fiber with splices at 1km Interval, each giving an attenuation of 1dB.
iv) The numerical input/output power ratio.

b) Briefly write about fiber joint losses? **06**

Q4 a) Write note on Avalanche photodiode. **08**

b) Write a note on fiber bending losses? **06**

Q5 a) Briefly explain the vapour phase deposition technique for optical fiber preparation. **08**

B Explain how fluoride glass fiber is manufactured. **06**

Q6 a) Defined the terms LED Power, LED efficiency and derive the expression between them **08**

b) What are the important factors that limit speed response of the photodiode? **06**

Q7 a) Explain any one technique used to measured the cutoff **08**

wavelength of optical fiber.

b) Write a note on effect of noise on receiver performance?

Seat No.	

M.Sc. (Electronics Science) (Semester – IV) (New) (CBCS) Examination, 2017

COMMUNICATION PROTOCOLS

Day & Date: Saturday, 29-04-2017 Max. Marks: 70

Time: 02.30 PM to 05.00 PM

N.B. : *1) Question number 1, 2 and 6 are compulsory.*
*2) Attempt **any three** from questions number 3 to 7.*
3) All questions carry equal marks.
4) Use of nonprogrammable calculator is allowed.

Q.1 A) Select the correct alternatives. **08**

1) Which of the following protocol is mainly intended to support the control of mechatronic elements?

a) IEEE 802.11 b) LIN
c) Flex Ray d) Bluetooth

2) _____ is a WLAN protocol.
a) USB b) I^2C
c) IEEE 802.11 d) None of the above

3) GPRS is introduced in _____.
a) 1G b) 2G c) 2.5G d) 3G

4) 1ub interface is the interface between _____&_____ in UMTS interface.
a) Node-B, RNC b) RNC,RNC
c) UE, Node-B d) MSC, SGSN

5) _____ roaming is complicated then the GSM.
a) NMT b) IS-95
c) EDGE d) GPRS

6) 3GPP has specified _____ standard.
a) R99 b) TACS c) NTT d) AMP

7) In the non-transparent mode of IP internetworking model, the _____ gets IP address directly from _____.
a) MS, SGSN b) MS, GGSN
c) GGSN, PDN d) GGSN, an external DHCP

8) PLMN stands for _____.
a) Primary level mobile network.
b) Packet location management node.
c) Public land mobile network.
d) Physical loop medium node.

B) State true or false. **06**

1) Data rate of fast moving users in 3G is up to 144 kbps.
2) In the word SGSN, G stands for gateway.
3) IPv4 is internet protocol version 4.
4) RS-422 port is available on any PC, no need to purchase.
5) Call waiting is a value added service.
6) BCCH channel is continuously active dummy burst substituted when there is no information to transmit.

Q.2 Attempt the following. (any 3)

1) Explain Bluetooth. **05**
2) Explain GPRS interfaces and reference points. **05**
3) What is call set-up procedure of GSM? **04**

Q.3 A) What is USB? Explain USB topology and mention its advantages. **08**
B) What is IEEE 802.11 standard? **06**

A) Draw and explain the types of GSM frame format. **10**
B) Discuss the MSC functioning of GSM. **04**

Q.5 A) Explain GPRS architecture with a suitable diagram. **10**
B) Write down the location management procedure of GPRS network. **04**

Q.6 A) Explain the mobility management of UMTS. **08**
B) Write a note on Node B and RNS of release-99. **06**

Q.7 A) What is MANET? Write down the applications of MANET. **10**
B) What is iGSM. **04**