Seat No.	

B.E. (Electronics) (Part-II) (Semester-VIII) Examination, April - 2017
MICROWAVE ENGINEERING
Sub. Code : 67777

Day and Date : Tuesday, 25-04-2017　　　　　　　**Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :　　1)　**All questions are compulsory.**
　　　　　　　　　2)　**Assume suitable data if necessary.**
　　　　　　　　　3)　**Figures to the right indicates full marks.**

SECTION-I

Q1) Attempt any two questions.　　　　　　　　　　　　　　　　　**[16]**
　　a)　Explain with suitable equations TM mode equations for rectangular waveguide.
　　b)　Explain two cavity klystron amplifiers with suitable diagram and equations.
　　c)　Determine the cut off wavelength for the dominant mode in a rectangular waveguide of breadth 10cms. For a 2.5 GHz signal propagated in this waveguide in the dominant mode; calculate the guide wavelength, the group and phase velocities?

Q2) Attempt any two questions.　　　　　　　　　　　　　　　　　**[16]**
　　a)　Explain different materials used for MMIC.
　　b)　What is magic Tee? Explain its operation with diagram.
　　c)　The dimensions of guide are 2.5×1cms. The frequency is 8.6GHz. Find the following
　　　　i)　Possible modes
　　　　ii)　Cut off frequencies
　　　　iii)　Guide wavelength

Q3) Write short notes on any three.　　　　　　　　　　　　　　　**[18]**
　　a)　Directional coupler
　　b)　Reentrant Cavities
　　c)　Microwave clean rooms
　　d)　BWCFA

P.T.O.

SECTION-II

Q4) Attempt any two of the following: [16]
   a) Explain three valley model for InP diode.
   b) Draw basic structure of HEMT (High electron mobility transistor) and explain processing steps for fabrication.
   c) Describe the operating principles with characteristics of the IMPATT diode.

Q5) Attempt any two of the following: [16]
   a) Explain in detail high power measurement calorimeter method.
   b) Explain reflectometer method for impedance measurement.
   c) Draw the diagram and explain the experimental procedure to measure microwave power using thermister.

Q6) Attempt any three of the following: [18]
   a) Explain directivity and beam width of slotted antenna.

   b) Explain parabolic reflector and how gain of this antenna is determined.

   c) Define and explain the terms

      i) SWR

      ii) Antenna gain

   d) Write note on conical antenna.

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Seat No.	

B.E. (Electronics Engineering) (Semester-VIII) (Revised) Examination, April - 2017
WIRELESS COMMUNICATION NETWORK
Sub. Code : 67778

Day and Date : Thursday, 27-04-2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**
                       2)   **Use suitable assumptions if required.**
                       3)   **Draw necessary figures on right side of answer sheet.**

SECTION-I

Q1) Solve any three: **[18]**

     a) Discuss different techniques used for improving coverage and capacity in cellular systems.

     b) If total of 30Mhz band is allocated for FDD cellular system which uses two 25Khz simplex channels to provide full duplex voice and control channels Compute the no of channels available per cell if system uses 1) 4 cell reuse structure 1) 7 cell reuse structure 2) 12 cell reuse structure. Assume 1Mhz is allocated spectrum for control channels distribute voice and control channels for each cell?

     c) Differentiate Fixed and Dynamic channel assignment strategies.

     d) Define Co-channel Interference, Adjacent-channel Interference and near-far effect.

Q2) Solve any two.   **[16]**

     a) Explain the channel allocation in GSM.

     b) Compare between FDMA,CDMA and SDMA.

     c) What is the main reason to accept hexagon shape for construction of cell? Explain concept of Frequency Reuse.

Q3) Solve any two.   **[16]**

     a) In brief explain objectives and advantages of GSM.

     b) GSM architecture & interfaces.

     c) Compare 2G and 3G wireless Networks.

SECTION-II

Q4) Write a short note on any three: **[18]**

   a)   Bluetooth protocols

   b)   SMS

   c)   Wireless transport layer security

   d)   WML

Q5) Attempt any two. **[16]**

   a)   Draw and explain architecture of an Infrastructure based 802.11 network.

   b)   Explain speech coding and decoding in GSM.

   c)   Draw and explain GPRS architecture reference model.

Q6) Attempt any two. **[16]**

   a)   Explain in detail architecture of Bluetooth with neat diagram.

   b)   What is MESs, MDBS, MDIS & CDPD handover in concern with CDPD architecture.

   c)   Explain functions and components of Wireless Application Protocol(WAP) architecture.

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Seat No.

B.E. (Electronics) (Part-IV) (Semester-VIII) Examination, April - 2017
POWER ELECTRONICS & DRIVES
Sub. Code : 67779

Day and Date : Saturday, 29-04-2017

Total Marks : 100

Time : 2.00 p.m. to 5.00 p.m.

Instructions :
1) **All Questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if necessary & state it clearly.**

SECTION-I

Q1) Solve any two of the following. **[18]**

a) Explain with different operating modes the operation of three phase semiconverter with RL load. Derive expression for average and rms load voltage for three phase semiconverter considering Transformer Leakage Inductance $Lc=0$.

b) A three phase fully controlled bridge circuit is fed from 400V, 3 phase main supply. The load resistance is 15 ohms. The average output voltage is 60% of maximum possible o/p voltage.

Find.
   i) firing angle.
   ii) average load current.
   iii) rectification efficiency.

c) Draw the neat circuit diagram and waveform of three phase half wave converter & derive the equation for Vdc & Vrms.

Q2) Solve any two of the following. **[16]**

a) Explain in detail 180° mode of conduction of three phase IGBT based inverter.

b) Explain different methods of voltage and frequency control of inverters.

c) List different harmonic reduction techniques & explain. Harmonic reduction by transformer connection.

P.T.O.

Q3) Solve any two of the following. **[16]**

    a)   What is the need of cycloconverter? Explain operation of bridge type single phase to single phase cycloconverter.

    b)   Explain single phase cycloconverter which divides the supply frequency by four.

    c)   Expalin methods of harmonic reduction in cycloconverter output.

SECTION-II

Q4) Solve any two. **[16]**

    a)   Explain the parts of electric drives.

    b)   Explain speed control of separately excited DC motor using single phase half controlled rectifier with appropriate waveform.

    c)   Draw torque speed characteristics of induction motor. Explain the following operating modes.

        i) Motoring region   ii) Breaking region iii) Generating region

Q5) Solve any two. **[16]**

    a)   What are the advantages of electric drives.

    b)   Explain the speed control of induction motor by static rotor resistance control.

    c)   A 230V, 960rpm & 200A separately excited D.C. motor has an armature resistance of 0.02Ω the motor is fed from a chopper which provides both motoring and braking operation. The source has voltage of 230V. assuming continuous conduction.

        i)   Calculate duty ratio of chopper for motoring operation at 350rpm.

        ii)   Calculate duty ratio of chopper for breaking operation at 350rpm.

Q6) Write note on any three. **[18]**

    a)   Auto transformer starter.

    b)   Plugging or reverse voltage braking of induction motor.

    c)   Speed control of D.C. series motor using rectifier.

    d)   Selection criteria of a electric drive.

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Seat No.

B.E. (Electronics and Telecommunication) (Semester - VIII) Examination, April - 2017
DIGITAL IMAGE PROCESSING (Revised)
Sub. Code : 67818

Day and Date : Saturday, 29 - 04 - 2017　　　　　　　**Total Marks : 100**
Time : 02.00 p.m. to 05.00 p.m.
Instructions:　　*1)　All questions are compulsory.*

　　　　　　　　2)　Figures to the right indicate full marks.

　　　　　　　　3)　Assume suitable data if necessary.

Q1) Attempt any two of the following:　　　　　　　　　　**[2 × 8 = 16]**

　　a)　Explain the components of image processing system with neat block diagram.

　　b)　Explain various modalities of image acquisition and sensing.

　　c)　Draw the structure of human eye and explain elements of visual perception.

Q2) Attempt any two of the following:　　　　　　　　　　**[2 × 8 = 16]**

　　a)　Explain various arithmetic and logical operations in Digital Image Processing.

　　b)　What is meant by histogram of an Image? Explain the significance of histogram equalization

　　c)　Explain the Hadamard transform in Digital image processing.

Q3) Attempt any two of the following:　　　　　　　　　　**[2 × 9 = 18]**

　　a)　Explain sharpening filters in frequency domain.

　　b)　Explain the significance of first order and second order derivative for image sharpening.

　　c)　Explain linear and non-linear smoothing filters in spatial domain.

P.T.O.

Q4) Attempt any two of the following: **[2 × 8 = 16]**

   a)   Explain Erosion operation in detail along with mathematical expressions and example.

   b)   Explain thinning algorithm in detail with example. Also mention the mathematical expression for thickening operation.

   c)   Explain Closing operation along with example. Also state the use of closing operation in morphological image processing.

Q5) Attempt any two of the following: **[2 × 8 = 16]**

   a)   How to detect a line or edge in an image explain with an example?

   b)   What is use of thresholding operation? Explain global thresholding with an example.

   c)   What is region based segmentation? Explain region splitting and merging algorithm in detail.

Q6) Attempt any two of the following: **[2 × 9 = 18]**

   a)   What is coding redundancy? Explain with the help of example.

   b)   What is lossless predictive coding, explain in detail.

   c)   What is a colour model? Explain in detail various colour models.

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Seat
No.

B.E. (Electronics) (Semester - VIII) Examination, May - 2017
HIGH PERFORMANCE COMPUTER NETWORK
Sub. Code : 67786

Day and Date : Wednesday, 03 - 05 - 2017　　　　　**Total Marks : 100**
Time : 02.00 p.m. to 05.00 p.m.
Instructions :　　1)　**All questions are compulsory.**
　　　　　　　　　2)　**Assume suitable datait necessary.**

SCETION-I

Q1) Attempt any two　　　　　　　　　　　　　　　　　　　　　**[18]**

　　a)　Compare and contrast OSI and TCP-IP Model.

　　b)　Explain IEEE (802.11) wircless lan standerd.

　　c)　Draw and explain FDDI Network.

Q2) Attempt any two.　　　　　　　　　　　　　　　　　　　**[16]**

　　a)　State and explain signaling system-7

　　b)　What are possible configurations for ISDN user interface? Explain various functional groupings in ISDN

　　c)　Differentitate between ISDN and ATM.

Q3) Attempt any two.　　　　　　　　　　　　　　　　　　　**[16]**

　　a)　Draw and explain cell header structure for NNI.

　　b)　Draw and explain various Adpation layers.

　　c)　Explain virtual path and virtual channel.

SCETION-II

Q4) Attempt any two.　　　　　　　　　　　　　　　　　　　**[18]**

　　a)　Discuss in detail multi protocol label switching (MPLS)

　　b)　Draw and explain frame relay interworking with ATM.

　　c)　With help of block diagram explain optical lans.

P.T.O.

Q5) Attempt any two. [16]

    a)   State and explain frame relay protocol.

    b)   Draw and explain WDM System.

    c)   Explain congestion control in frame relay.

Q6) Attempt any two. [16]

    a)   Discuss in detail RSVP.

    b)   Explain in detail frame relay protocal.

    c)   Describe in detail optical cross connect.

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Seat No.	

B.E. (Electronics Engineering) (Semester - VIII) (Old) Examination, May - 2017
(Elective - II): WIRELESS COMMUNICATION NETWORK
Sub. Code : 49438

Day and Date : Wednesday,03-05-2017   **Total Marks :100**

Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**

2)   **Assume suitable data, if necessary.**

3)   **Draw neat diagrams wherever necessary.**

4)   **Exercise the option as indicated in individual question.**

5)   **Figures to right indicate full marks.**

Q1) Solve any two.   **[18]**

a)   Explain Cellular system architecture & operation.

b)   Compare the multiple access techniques in terms of modulation, FEC coding, diversity, system complexity and multiple access interference (MAI).

c)   If GSM uses a frame structure where each frame consist of eight time slots & each time slot contains 156.25 bits & data is transmitted at 270.833 kbps in the channel find,

i)   the duration of the bit

ii)   the time duration of the slots

iii)   the time duration of the frame.

Q2) Solve any two.   **[16]**

a)   Explain how the adjacent channel interference is reduced in cellular system.

b)   What is hand off? Explain the different hand off strategies used in wireless communication.

P.T.O.

c) A spectrum of 30 MHz is allocated to a wireless FDD cellular system which uses two 25 kHz simplex channel to provide full duplex voice & control channels, compute the number of channels available per cell if a system uses,

    i)   four-cell reuse,

    ii)   seven-cell reuse

    iii) 12-cell reuse

If 1 MHz of the allocated spectrum is dedicated to control channels, determine on equitable distribution of control channels & voice channels in each cell for each of the three systems.

Q3) Solve any two. **[16]**

a) With suitable diagram explain frame structure of GSM.

b) In IS-95 CDMA system, if W=1.25MHz, R=9600bps and N=14 users

    i)   Calculate Eb/No

    ii)   When no voice activity is there, calculate Eb/No for omnidirectinal antennas

    iii) If voice activity = 3/8 and three sector antennas are used, calculate the total number of users per cell.

c) Explain how MSC together with HLR & VLR data bases provide call routing & roaming capability to GSM.

Q4) Solve any two. **[18]**

a) What are the advantages of wireless LAN in terms of flexibility, design & robustness? Draw the configuration of IEEE802.11 architecture?

b) With suitable timing diagram describe power management function & roaming function.

c) Draw protocol stack of Bluetooth and describe RFCOMM cable replacement protocol.

Q5) Solve any two. [16]

a) With suitable timing diagram explain distributed foundation wireless medium access control.

b) Explain Bluetooth Scatter Net.

c) Draw network architecture of CDPD & briefly describe,

Mobile End Systems (M-ESs), Mobile Data Base Station (MDBS), Mobile Data Intermediate Systems (MDIS) and CDPD handover.

Q6) Solve any two. [16]

a) Explain in detail frame control field of Wi-Fi MAC frame.

b) With suitable timing diagram explain how hidden node problem is solved in IEEE 802.11 using RTS, CTS, ACK & net allocation vector.

c) Draw and explain WAP programming architecture. Explain the function of the elements of WAP programming architecture.

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Seat
No.

B.E. (Electronics) (Semester - VIII) (Revised) (Old) Examination, May - 2017
BROADBAND COMMUNICATION (Elective - II)
Sub. Code : 49437

Day and Date : Wednesday,03-05-2017   **Total Marks :100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**
                     2)   **Neat Diagrams must be drawn wherever necessary.**
                     3)   **Assume suitable data if necessary.**

SECTION - I

Q1) Attempt any two.   [18]

   a)   Explain the terms: Propagation delay, node delay and transmission time.

   b)   Explain the principle & working of SONET.

   c)   Write a note on B-ISDN services.

Q2) Attempt any two.   [16]

   a)   What is need of interworking? Explain types of interworking.

   b)   Explain with neat diagram ISDN protocol architecture.

   c)   Compare between packet switching and circuit switching.

Q3) Attempt any two.   [16]

   a)   Describe in details signal hierarchy and system hierarchy.

   b)   What are ISDN connections for end to end communication? Explain one of them.

   c)   Explain the importance of ISDN standards. What is the structure of i-series recommendation?

P.T.O.

Q4) Attempt any two. **[16]**

a) What are the different traffic parameters in ATM? Describe these parameters in brief. What is the need of so many parameters?

b) With the help of neat diagram explain ATM swich.

c) Discuss the following parameters for ATM cell.

    i) Latency,

    ii) Speed effect.

Q5) Attempt any two. **[16]**

a) State & explain various traffic descriptors.

b) What are the key aspects of Classical IP over ATM? Explain with reference to the followings: Address Resolution, Caching and MTU size.

c) Explain the ATM Signaling reference model and discuss the role of different protocols in this model.

Q6) Write short notes (Attempt any TWO). **[18]**

a) AAL5 services and protocols.

b) Rate based traffic control.

c) End to end traffic bounds.

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Seat No.

B.E. (Electronics Engineering) (Pre-revised) (Semester-VIII) (Old) Examination, April - 2017
MICROWAVE ENGINEERING
Sub. Code : 49436

Day and Date : Saturday, 29-04-2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All Questions are compulsory.**
                2)   **Figures to right indicate full marks.**
                3)   **Assume suitable data if necessary.**

SECTION-I

Q1) Attempt any two of the following.

a) Explain the modes of propagation in case of circular waveguides. Explain the losses in the waveguide.   **[8]**

b) With suitable diagram, explain the operation of directional coupler. What are it's applications?   **[8]**

c) A rectangular waveguide of inside dimensions a=4.5cm, b=3cm. With 9GHZ signal propagated in it. Find.   **[8]**

   i)   The cut off wavelength.

   ii)   the guide wavelength

   iii)   the group and phase velocities

   iv)   the characteristic wave impedance for TE_{10} mode of operation.

Q2) Attempt any two of the following.

a) With the aid of schematic diagram describe the travelling wave tube. What is slow wave structure? Why does TWT. need such a structure?

   [9]

b) Describe the construction and working of magnatron as oscillator.   **[8]**

c) Explain following in connection with reflex klystron   **[9]**

   i)   Velocity modulation and electron bunching

   ii)   Condition for obtaining power output.

P.T.O.

Q3) Attempt any two of the following.

    a)   Explain LSA diodes. **[8]**

    b)   With the help of schematic diagram explain construction and operation of MESFET. Give it's applications. **[8]**

    c)   Explain the principle of the Gunn diode and list the modes of operation. **[8]**

SECTION-II

Q4) Attempt any two of the following.

    a)   Explain MMIC fabrication techniques. **[8]**

    b)   Explain various types of microwave radiation Hazards. **[8]**

    c)   Write short note on anechoic chambers and microwave clean rooms. **[8]**

Q5) Attempt any two of the following.

    a)   Explain in detail high power measurment Calorimeter method. **[9]**

    b)   Explain working of wavemeter method to measure microwave frequency. **[8]**

    c)   Explain Balometer method for measurment of microwave power. **[9]**

Q6) Attempt any two of the following.

    a)   With neat diagram explain microstrip antenna and it's radiation mechanism. **[9]**

    b)   Explain LENs Antenna and list the advantages and disadvantages of dielectric lense. **[8]**

    c)   Explain in detail Horn antenna with all type of feeding methods. **[8]**

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Seat No.

BE (Electronics) (Part - IV) (Semester - VIII) (Old) Examination, April - 2017
OPERATING SYSTEM
Sub. Code : 49435

Day and Date : Thursday,27-04-2017   **Total Marks :100**

Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**

2)   **Assume suitable data if required and mention it clearly.**

SECTION - I

Q1) Solve any three (each 6 marks):

a)   Describe compiler in brief.

b)   Give in detail usage and implementation of semaphore.

c)   Describe SJF scheduling algorithm.

d)   Explain concept of context switch with diagram.

e)   Describe various services offered by Operating System.

Q2) Solve any two (each 8 marks):

a)   Describe semaphore based solution to the producer consumer problem using bounded buffer.

b)   What is critical section and critical region? What are requirement of mutual exclusion?

c)   Explain the Banker's algorithm for dead-lock avoidance.

P.T.O.

Q3) Solve any two (each 8 marks):

a) What are software solutions for mutual exclusion?

b) What do you mean by semaphore? What are the limitations of semaphore?

c) What is a Safe State and what is its use in deadlock avoidance?

SECTION - II

Q4) Write a short note on (any three) (each 6 marks):

a) Address translation in segmentation.

b) Translation Look aside buffer (TLB).

c) Device drivers.

d) Real time operations in Embedded OS.

e) Secondary storage structure and disk structure.

Q5) Solve any two (each 8 marks):

a) Explain the concept of paging scheme in memory management.

b) Explain FIFO algorithm used for page replacement.

c) Explain the principle of operation of dynamic partitioned memory allocation.

Q6) Solve any two (each 8 marks):

a) Describe the concept of swapping of two processes using disk as backing store.

b) Describe different allocation methods of file.

c) State virtual memory concept.

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Seat No.

B.E. (Electronics Engg.) (Semester - VII) (Revised) Examination, May - 2017
REAL TIME SYSTEMS (Elective I)
Sub. Code : 67536

Day and Date : Friday, 19 - 05 - 2017　　　　　　　　**Total Marks : 100**

Time : 02.00 p.m. to 5.00 p.m.

Instructions :　　1)　All questions are compulsory.

　　　　　　　　2)　Numbers to the right indicate full marks.

　　　　　　　　3)　Assume suitable data wherever necessary.

SECTION-I

Q1) Solve any three　　　　　　　　　　　　　　　　　　　　　　**[18]**

　　a)　With suitable block diagram explain air traffic/flight control hierarchy.

　　b)　Discuss briefly hard and soft time constraints.

　　c)　Which are the possible functional parameters? Explain any one in detail.

　　d)　Briefly explain Least - Stack - Time-First (LST) algorithm.

Q2) Solve any two.　　　　　　　　　　　　　　　　　　　　　　**[16]**

　　a)　Explain the concept of effective timing constraints with suitable example.

　　b)　With the help of real time model system explain the concept of scheduler.

　　c)　What is meant by soft real time system? Briefly discuss with suitable example.

Q3) Solve any two.　　　　　　　　　　　　　　　　　　　　　　**[16]**

　　a)　Which are the characteristics and requirements of real time databases? Briefly write about them.

　　b)　Discuss data dependency in detail.

　　c)　Write a short note on Priority driven scheduling approach.

P.T.O.

SECTION-II

Q4) Solve any three. **[18]**

a) Discuss briefly cyclic executive approach with reference scheduler.

b) Write short note on Rate monotonic fixed priority scheduling algorithm.

c) What is meant by sporadic serves? Which are the servers available? Explain any one in detail.

d) Briefly write about constant utilization server algorithm.

Q5) Solve any two. **[16]**

a) Define stack sharing priority - ceiling protocol. Also write about the rules of the same.

b) Briefly write about Preemptive weighted fair queuing algorithm.

c) With the help of suitable timing diagrams, explain the concept of tick-scheduling.

Q6) Solve any two. **[16]**

a) Discuss briefly the practical considerations of scheduling tasks on multiprocessor system.

b) Explain the concept of time demand analysis.

c) Define basic Priority - Inheritance protocol related to scheduling algorithms. Also discuss rules of the same in detail.

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Seat
No.

B.E. (Electronics) (Semester - VII) (Revised)
Examination, May - 2017
SATELLITE COMMUNICATION (Elective - I)
Sub. Code : 67531

Day and Date : Friday, 19 - 05 - 2017   **Total Marks : 100**
Time : 02.00 p.m. to 05.00 p.m.

Instructions : 1) **All Questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if necessary.**

Q1) Solve any Four.   **[4 × 4 = 16]**

   a)   Explain frequency allocation in satellite communication.

   b)   Define the term Reliability.

   c)   Explain the term attitude control.

   d)   Draw and explain the term sun transit outage.

   e)   What is look angle?

   f)   Explain any four application of satellite.

Q2) Solve any Two.   **[2 × 8 = 16]**

   a)   Explain attitude + orbit control system (AOCS) of satellite.

   b)   Explain the elevation angle calculation and azimuth angle calculation for antenna at receiving earth station.

   c)   What do you mean by transponder? Explain double conversion transponder system.

Q3) Solve any Three.   **[3 × 6 = 18]**

   a)   Explain antenna used in satellite.

   b)   Explain power system in satellite communication.

   c)   What is meant by frequency reuse?

   d)   How communication system performance affected by orbital effect.

   e)   Draw block diagram of spacecraft communication system and explain.

P.T.O.

Q4) Solve any FOUR. **[4 × 4 = 16]**

  a)   Define - i) Noise figure. ii) Noise temperature.

  b)   What is GPS time?

  c)   Explain Split-IP implementation of VSAT network architecture.

  d)   Define following terms - i) Horizontal dilution of precision. ii) Vertical dilution of precision.

  e)   Draw and explain signal format of VSAT inbound signal.

  f)   Explain term Effective isotropically Radiated Power.

Q5) Solve any TWO. **[2 × 8 = 16]**

  a)   Derive general link equation and find out expression for C/N and G/T ratio.

  b)   Draw and explain schematic of a typical Hub master control earth station.

  c)   An earth station antenna has a diameter of 30m, has an overall efficiency of 68% and is used to receive a signal at 4150 MHz. At this frequency, the system noise temperature is 79K when the antenna points at the satellite at an elevation angal of 28°. What is the earth station G/T ratio under these conditions?

Q6) Solve any THREE. **[3 × 6 = 18]**

  a)   Draw and explain protocol architecture of a star VSAT network.

  b)   With a block diagram explain working of a GPS receiver.

  c)   State different types of codes used in GPS? Explain any one code in detail.

  d)   With block diagram explain System noise temperature.

  e)   Write a note on satellite signal acquisition.

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Seat
No.

B.E. (Electronics Engg.) (Part-I) (Semester-VII) (New) (Revised) Examination, May - 2017
INFORMATION THEORY AND CODING TECHNIQUES
Sub. Code : 67526

Day and Date : Monday, 15-05-2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**
               2)   **Figures to the right indicate full marks.**
               3)   **Assume suitable data if necessary.**

SECTION-I

Q1) Attempt any Three of the following.   **[18]**

a) What is mutual information? State and prove the properties of mutual information.

b) Explain the encoding & decoding procedure for (n, k) linear block code.

c) A channel has the following channel matrix is given by,

$$P(Y/X) = \begin{bmatrix} 1\text{-}p & p & 0 \\ 0 & p & 1\text{-}p \end{bmatrix}$$

     i)   Draw Channel Diagram.

     ii)   If the sources has equally likely outputs, find probability of output if $P = 0.7$

d) Determine the parity check matrix (H) for the (5, 3) code. Show that $G.H^T=0$ and $C.H^T=0$ for $C=(1\ 1\ 0\ 1\ 0)$. The generator matrix is,

$$\begin{bmatrix} 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \end{bmatrix}$$

P.T.O.

Q2) Attempt any two of the following. [16]

   a) Using Huffman's Coding for the following message ensemble:

   [X] = [X_1 X_2 X_3 X_4 X_5 X_6 X_7]

   P [X] = [0.45   0.15   0.1   0.1   0.08   0.08   0.04]

   Determine entropy of the source, average length of coded message and the coding Efficiency.

   b) Prove the following relationship:

   i) $I (X Y) = H (Y) - H (Y / X)$

   ii) $H (X Y) = H (X / Y) + H (Y)$

   c) A (6, 3) linear block code generated by the generator matrix as

   $$G = \begin{bmatrix} 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$$

   Determine: i)   Parity check Matrix (H)

   ii) All code wards

   iii) Minimum distance & error correction capability of code

   iv) Prepare decoding table.

   v)   If received code vector R = [0 0 0 1 0 1] is received. Find the corrected code ward.

Q3) Attempt any Two of the following. [16]

   a) For the given channel matrix, determine the all entropies & mutual information. Given P (y_1) = 0.6, P (y_2) = 0.3 and P (y_3) = 0.1

   $$P(X/Y) = \begin{matrix} & Y_1 & Y_2 & Y_3 \\ X_1 & \begin{bmatrix} 0.8 & 0.5 & 0.1 \\ X_2 & 0 & 0.2 & 0.5 \\ X_3 & 0.2 & 0.3 & 0.4 \end{bmatrix} \end{matrix}$$

   b) i) For an AWGN channel with 4 kHz bandwidth, noise power spectral density ($\eta/2$) is 1 pico watts/Hz and the signal power at the receiver is 0.1 mW. Determine the actual & maximum capacity of channel.

   ii) A binary sequence is emitting an independent sequence of $0'$s and $1'$s with probabilities P and (1-P) respectively. Prove that entropy is maximum when both messages are equally likely. Also Plot the entropy of this source versus P (0 < P < 1).

c) i) Derive an expression for channel capacity of binary symmetric channel.

ii) What is minimum Distance? Explain how error detection and correction Capabilities of block code are related to minimum distance?

SECTION-II

Q4) Attempt any Three of the following. **[18]**

a) Explain the procedure for constructing extension field GF (2^m) using suitable primitive polynomial. Also prepare addition & multiplication table for GF (8).

b) A (7, 3) cyclic code has generator polynomial $g(x) = X^4 + X^2 + X + 1$. Determine the code vectors for the message vector (101) and (111) using nonsytematic & systematic form method.

c) Explain the structural & distance properties of convolutional code.

d) Find the generator polynomial for (7, 5) RS code over GF (8). Also determine the code polynomial & code if the message vector is (α^2, α^5, α^3).

Q5) Attempt any Two of the following. **[16]**

a) Design an encoder and Syndrome calculator for the (7, 4) Cyclic code generated by, $g(X) = X^3 + X^2 + 1$ and verify it's operation using the message vector (1111). Also determine syndrome Vector for the error pattern (0100000).

b) A (15, 7) BCH double error correcting code has the generator polynomial, $g(X) = X^8 + X^4 + X^2 + X + 1$. Find the transmitted Code ward, if the received code ward is $(X^3 + X^2)$. Consider a Primitive polynomial is $f(x)=X^4 + X^3 + 1$.

c) i) Write a short note on Minimal polynomial.

ii) What is cyclic redundancy Check Codes? Explain the procedure to obtain CRC.

Q6) Attempt any Two of the following. **[16]**

a) Generate a (7, 4) systematic cyclic code using generator matrix. What are the error correcting Capabilities of this code. Design a decoding method using parity check matrix if the following code wards are received as

    i)   1101101 and

    ii)   0101000, find the corrected transmitted code ward.

b) A convolutional encoder using three shift registers and $r = 1/3$ has three generating vectors as : $g_1 = [1\ 1\ 0]$, $g_2 = [1\ 0\ 1]$ and $g_3 = [1\ 1\ 1]$

    i)   Sketch the encoder configuration

    ii)   Determine the generator matrix

    iii)   Determine the output code sequence of the encoder for the message sequence is (1 0 1 1).

    iv)   Draw Code Tree and state diagram.

c)   i)   State the difference between code tree & code trellis in convolutional code.

    ii)   Determine the various primitive elements of the Galois field GF (5).

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Seat No.

B.E. (Electronics Engineering) (Semester - VII) (Old) Examination, May - 2017
REAL TIME SYSTEMS (Elective - I)
Sub. Code : 47956

Day and Date : Friday, 19 - 05 - 2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions : 1) Figures to the right indicate full marks.
2) Assume suitable data, if necessary.
3) All questions are compulsory.

SECTION - I

Q1) Answer the following (Any Two)   **[16]**

a) Describe a computer system which is completely a Real Time System.

b) Explain structure of Real Time System. What are different task classes?

c) How hard deadlines are performance measured for the real time system?

Q2) Answer the following (Any Two)   **[16]**

a) Differentiate between classical uniprocessor scheduling and fault tolerant scheduling.

b) Discuss various approaches used for real time software specification and verification.

c) Explain Run-time error and its handling in Real Time System.

Q3) Write short notes (Any Three)   **[18]**

a) Difference between embedded system and RTS.

b) Fixed priority and dynamic priority scheduling algorithms.

c) IRIS Tasks.

d) Precedence graph.

P.T.O.

SECTION - II

Q4) Answer the following (Any Three) [18]

    a)   Define the terms-atomicity, consistency, isolation.

    b)   What is transaction aborts? Explain it in brief.

    c)   Write a note on-disk scheduling algorithm.

    d)   Describe network topologies.

Q5) Answer the following (Any Two) [16]

    a)   Explain the common ways of sending messages.

    b)   Explain the token based protocol.

    c)   Write a note on- fault tolerant routing.

Q6) Answer the following (Any Two) [16]

    a)   Describe fault and error containment.

    b)   Explain reliability models for hardware redundancy.

    c)   Explain fault tolerant synchronization in hardware.

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Seat No.	

B.E. (Electronics) (Semester - VII) (Pre - Revised) (Old) Examination, May - 2017
DIGITAL IMAGE PROCESSING (Elective - I)
Sub. Code : 47955

Day and Date : Friday, 19 - 05 - 2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

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

SECTION - I

Q1) Attempt any Two   **[18]**

   a)   Explain fundamental steps in digital image processing.

   b)   Describe sampling, quantization and representation of Image.

   c)   Explain Neighbors of a pixel, adjacency and different distance measures.

Q2) Attempt any Two   **[16]**

   a)   What is Histogram? Explain histogram equalization process with an example.

   b)   Explain contrast stretching and gray level slicing.

   c)   Describe image subtraction and image averaging.

Q3) Attempt any Two   **[16]**

   a)   Describe Laplacian filter.

   b)   Explain smoothing liner filters.

   c)   Explain basic steps for filtering in the frequency domain.

P.T.O.

SECTION - II

Q4) Attempt any Two [18]

   a)   Explain Hit-or-Miss transformation.

   b)   Explain Morphological opening and closing with neat diagram.

   c)   Describe region Thickening and skeletons.

Q5) Attempt any Two [16]

   a)   Explain edge detection in details.

   b)   Describe Thresholding and Write an algorithm used for global Thresholding.

   c)   Explain region splitting and merging.

Q6) Attempt any Two [16]

   a)   Explain coding redundancy and Fidelity criteria.

   b)   Explain general compression system model.

   c)   Explain Lossy predictive coding model.

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Seat No.

B.E. (Electronics) (Semester - VII) (Pre - Revised) (Old) Examination, May - 2017
BIOMEDICAL INSTRUMENTATION (Elective - I)
Sub. Code : 47952

Day and Date : Friday, 19 - 05 - 2017　　　　　　　　**Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

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

SECTION - I

Q1) Attempt any THREE from following　　　　　　　　　　　　**[18]**

　　a)　What is meant by cell? What are resting and action potential?

　　b)　Explain needle electrodes used for EEG.

　　c)　Explain working of ultrasonic blood flow meter.

　　d)　With neat sketch explain working of isolation amplifier.

Q2) Attempt any TWO.　　　　　　　　　　　　　　　　　　**[16]**

　　a)　Write note on body surface electrodes.

　　b)　Draw suitable diagram of differential amplifier and explain how it is used in biomedical instrumentation.

　　c)　What is meant by contact impedance? Explain the effect of high contact impedance.

Q3) Attempt any TWO　　　　　　　　　　　　　　　　　　**[16]**

　　a)　Explain how thermistor and strain gauge can be used for respiratory measurement system.

　　b)　With neat sketch explain electromagnetic blood flow meter.

　　c)　Explain with example how electrical activity of eye can be monitored?

P.T.O.

SECTION - II

Q4) Attempt any three from following   **[18]**

    a)   Explain lead system used for EEG recording.

    b)   Explain any one method for heart rate measurement.

    c)   What are different biological effect of X-ray on human body. Suggest necessary precautions.

    d)   What are different transducers selection factors for biomedical applications.

Q5) Answer any TWO   **[16]**

    a)   With block schematic explain working of ECG recording machine.

    b)   With neat sketch explain the working of image intensifier.

    c)   What are different preventive measures to reduce shock hazards.

Q6) Answer any TWO   **[16]**

    a)   Explain in detail working and characteristics of :-

        i)   Differential amplifier.

        ii)   Carrier amplifier.

    b)   Explain the effect of electrode placement in EMG recording. What are effective electrode placement used for EMG measurement?

    c)   Explain different blood pressure measurement methods.

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Seat No.	

B.E. (Electronics) (Part - IV) (Semester - VII) (Old) Examination, May - 2017
SATELLITE COMMUNICATION (Elective - I)
Sub. Code : 47951

Day and Date : Friday, 19 - 05 - 2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**
                           2)   **Figures to the right indicate full marks.**
                           3)   **Assume suitable Data wherever necessary.**

SECTION - I

Q1) Solve any Two   **[16]**

a)   What are kepler's three laws of planetary motion? Also explain the parameters to describe the satellite orbit.

b)   Explain following terms:

   i)   EIRP.

   ii)   Link Budget.

c)   Explain GEO, IEO and MEO satellite. Compare these three with respect to factors such as size and shape of the orbit propagation delay period of rotation and application.

Q2) Solve any Two   **[16]**

a)   Draw the block diagram of spacecraft communication system and explain their function.

b)   Derive general link equation and find out expression for C/N and G/T ratio.

c)   A satellite at a distance of 40,000 km from the a point on the earth surface radiates a power of low from an antenna with a gain of 17 Db in the direction of observer. If it operate at 11GHz frequency and receiving antenna gain is 52.3 Db. Find the receiving power.

P.T.O.

Q3) Solve any Three [18]

a) Write the design procedure for satellite communication link.

b) Explain attitude and orbit control system in detail.

c) Explain frequency allocation technique in satellite communication.

d) Explain the applications of satellite communication.

SECTION - II

Q4) Solve any Two [16]

a) Explain the concept of demand accesses multiple accesses with neat schematic.

b) Explain with block diagram working of transmitter part of earth station.

c) Explain codes used in GPS in details.

Q5) Solve any Two [16]

a) What is the GPS position location principal? With neat block diagram explain the working of GPS receiver.

b) What is meant by DBS-TV system? Explain with respect to DBS-TV receiver.

c) Explain the terms:

   i) Equatorial orbit.

   ii) Inclined orbit.

   iii) Sun Synchronous orbit.

Q6) Solve any Two [18]

a) Compare TDMA, FDMA and CDMA.

b) Write short notes on following system:

   i) Iridium.   ii) Teledesic.

c) Compare radio navigation and satellite navigation.

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Seat
No.

B.E. (Electronics Engineering) (Semester - VII)
(Pre-revised) (Old) Examination, May - 2017
FIBER OPTICAL COMMUNICATION (Elective - I)
Sub. Code : 47950

Day and Date : Friday, 19 - 05 - 2017　　　　　　**Total Marks : 100**
Time : 02.00 p.m. to 05.00 p.m.

Instructions : 1) **All Questions are compulsory.**
　　　　　　　　2) **Figures to the right indicate full marks.**
　　　　　　　　3) **Assume suitable data if necessary.**

SECTION - I

Q1) Attempt any two of the following.　　　　　　　　　　**[16]**

　　a)　Explain optical fiber communication system and state basic network information rates.

　　b)　Explain attenuation and absorption meachanisms in optical fiber.

　　c)　Describe internal quantum efficiency and external quantum efficiency of optical source. Derive necessary expressions.

Q2) Attempt any two of the following.　　　　　　　　　　**[16]**

　　a)　What is signal distortion? Explain conditions to achieve distortion less optical fiber system.

　　b)　Explain in detail double crucible method of fiber manufacturing. Mention its advantages and disadvatages.

　　c)　A multimode step index fiber with a core radius of 25 μm and relative refractive index difference of 0.01 is operating at 0.84 μm wavelength. If refractive index of core is 1.48, determine normalized frequency and number of modes.

P.T.O.

Q3) Write notes on any three of the following. **[18]**

    a)   Types of fibers.

    b)   Bending Losses.

    c)   Fiber optical cables.

    d)   Nonlinear optical effects.

SECTION - II

Q4) Attempt any two of the following. **[16]**

    a)   Explain with neat diagram structure of surface emitting LED.

    b)   Explain laser diode modes and threshold conditions.

    c)   Explain with neat diagram, DFB laser diode.

Q5) Attempt any two of the following. **[16]**

    a)   Draw and explain the structure of InGaAs APD.

    b)   Explain in detail operational principle of WDM and WDM components.

    c)   With the help of suitable figure, explain basic sections of an optical receiver.

Q6) Write notes on any three of the following. **[18]**

    a)   PIN photodiode.

    b)   Receiver Sensitivity.

    c)   Quantum efficiency and LED power.

    d)   Light source linearity.

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Seat No.

B.E. (Electronics Engineering) (Semester-VII) (Old) (Revised) Examination, May - 2017
VIDEO ENGINEERING
Sub. Code : 47948

Day and Date : Wednesday, 17-05-2017　　　　　　　　**Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :　　**1)**　**All questions are compulsory.**
　　　　　　　　2)　**Use suitable assumptions if required.**
　　　　　　　　3)　**Draw necessary figures on right side of answer sheet.**

SECTION-I

Q1) Solve any three.　　　　　　　　　　　　　　　　　　　　　**[18]**

　　a)　Draw constructional detrails of Image Orthicon camera tube and describe its working.

　　b)　Draw the block diagram of SECAM decoder and write function of each block.

　　c)　Why AM is preferred for picture signal transmission and FM for sound signal transmission.

　　d)　Define the following terms related to T.V systems.

　　　　i)　Kell factor　　　　　　　ii)　Gama correction

　　　　iii)　Contrast　　　　　　　　iv)　Saturation

　　e)　Illustrate positive and negative modulation.

Q2) Solve any two.　　　　　　　　　　　　　　　　　　　　　**[16]**

　　a)　Why interlace scanning is necessary in TV system? Explain interlace scanning in brief.

　　b)　Explain compatibility considerations.

　　c)　Compare SECAM and NTSC T.V. system.

P.T.O.

Q3) Solve any two. [16]

    a) Explain Low level IF modulated color TV transmitter block diagram.

    b) How phase error is eliminated in PAL system.

    c) Compare Trinitron and PIL for its merit and demerits.

SECTION-II

Q4) Answer any THREE of the following. [18]

    a) Explain different Digital TV signals.

    b) Explain duo binary coding in HDTV.

    c) Explain various LCD matrix types with suitable diagram.

    d) Explain with diagram basic satellite system with uplink and downlink frequencies.

Q5) Answer any two of the following. [16]

    a) Explain Video processor in Digital TV receiver.

    b) Explain different HDTV Standards & compatibility.

    c) Draw and explain satellite TV receiver.

Q6) Answer any two of the following. [16]

    a) Explain Merits of Digital technology. Compare Digital TV and Analog TV.

    b) Draw and explain CCTV.

    c) Explain operating principle of Plasma receiver.

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Seat No.

B.E. (Electronics) (Semester - VII) (Pre-revised) (Old) Examination, May - 2017
POWER ELECTRONICS AND DRIVES
Sub. Code : 47947

Day and Date : Tuesday, 16 - 05 - 2017　　　　　　　　**Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :　　1)　**All questions are compulsory.**
　　　　　　　　2)　**Figures to the right indicate full marks.**
　　　　　　　　3)　**Assume suitable data if necessary.**
　　　　　　　　4)　**Use of non-programmable calculator is allowed.**

SECTION - I

Q1) Solve any two of the following:　　　　　　　　　　　　　　　　**[18]**

　　a)　Explain the operation of three phase semi control converter with RL load & draw the output voltage & current waveform for $\alpha \le \pi / 3$.

　　b)　3 phase full converter is operating with purely resistive load R = 10Ω. If α = 75º.
　　　　Calculate:
　　　　i)　Average output voltage.
　　　　ii)　rms output voltage
　　　　iii)　ripple factor

　　c)　With neat waveforms explain operation of 3 phase half wave controlled rectifier.

Q2) Solve any two of the following:　　　　　　　　　　　　　　　　**[16]**

　　a)　With neat circuit diagram explain the microcontroller based firing scheme for single phase full converter.

　　b)　What is need of isolation? Explain two techniques used for isolation.

　　c)　Write a note on cosine based firing circuit.

P.T.O.

Q3) Solve any two of the following: **[16]**

a) Explain the operation of single phase to 3 phase cycloconverter feeding R load. Draw the Waveforms.

b) Explain the operation of 3 phase to single phase cycloconverter feeding R load. DRaw necessary Waveforms.

c) Explain harmonic reduction techniques for cycloconverter.

SECTION - II

Q4) Solve any two of the following: **[18]**

a) Draw circuit diagram and wave forms of IG-BT based single phase half bridge inverter compare half bridge and full bridge inverter.

b) Explain working of single phase full bridge Mc-Murray inverter with necessary waveforms.

c) Explain 120 and 180 mode of conduction of three phase bridge inverter with necessary waveforms.

Q5) Solve any two of the following: **[16]**

a) Explain working of Three phase fully controlled rectifier control of seperately excited d.c. motor.

b) Explain operation of chopper controlled d.c. drives.

c) Explain multiquadrant operation of seperately excited d.c. motor.

Q6) Solve any two of the following: **[16]**

a) State and explain speed control methods of three phase induction motor.

b) With the help of block diagram explain working of closed loop control of A.C. drives.

c) Draw and explain torque-speed characteristics of Induction motor. Explain following modes.

　　i) Motoring

　　ii) Generating

　　iii) Breaking

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Seat No.	

B.E. (Electronics Engineering) (Part-IV) (Semester-VII) (Old) (Pre-Revised) Examination, May - 2017
INFORMATION THEORY AND CODING
Sub. Code : 47949

Day and Date : Thursday, 18-05-2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   **1)**   **All questions are compulsory.**
                2)   **Figures to the right indicate full marks.**
                3)   **Assume suitable data if necessary.**

SECTION-I

Q1) Attempt any Three of the following.   **[18]**

a)   What do you mean by Binary symmetric channel? Show that in Binary Symmetric Channel, the channel capacity is given by,

$$C = 1 + P \log P + (1-P) \log (1-P)$$

b)   Prove the following.

   i) $H(X, Y) = H(Y/X) + H(X)$

   ii) $I(X ; Y) = H(X) + H(Y) - H(X/Y)$

c)   State the Shannon channel capacity theorem. Show that the maximum channel capacity is given by, $C_{\infty} = \lim\limits_{B \to \infty} C = 1.44 [S/N_0]$

d)   What is mutual information? State and prove the properties of mutual information.

P.T.O.

Q2) Attempt any Two of the following. **[16]**

a) For the given channel matrix, determine the all entropies & mutual information. Given $P(Y_1) = 0.6$, $P(Y_2) = 0.3$ and $P(Y_3) = 0.1$

$$P(X/Y) = \begin{array}{c} \\ X_1 \\ X_2 \\ X_3 \end{array} \begin{array}{ccc} Y_1 & Y_2 & Y_3 \\ \begin{bmatrix} 0.8 & 0.5 & 0.1 \\ 0 & 0.2 & 0.5 \\ 0.2 & 0.3 & 0.4 \end{bmatrix} \end{array}$$

b) i) What is minimum Distance? Explain how error detection and correction capabilities of block code are related to minimum distance.

   ii) What is entropy? Derive an expression for entropy.

c) The Parity digits of a (6, 3) linear block code are given as,

$$C_4 = m_1 \oplus m_2, \ C_5 = m_1 \oplus m_2 \oplus m_3, \ C_6 = m_1 \oplus m_3$$

Determine:

   i) Generator matrix (G) and Parity check matrix (H)

   ii) All code wards

   iii) Error detecting and correcting capability.

   iv) If the received code ward is (101101), find the transmitted message.

Q3) Attempt any Two of the following. **[16]**

a) A discrete memory less source has five symbols X_1, X_2, X_3, X_4 and X_5 with Probabilities $P(X_1) = 0.4$, $P(X_2) = 0.2$, $P(X_3) = 0.15$, $P(X_4) = 0.15$, $P(X_5) = 0.1$.

   i) Construct Shannon fano Code and Huffman's Code.

   ii) Calculate code efficiency of both codes and compare the result with Comment.

b) i) A Gaussian channel has a bandwidth of 4 KHz and a two sided noise power spectral density ($\eta/2$) of 10^{-14} Watt/Hz. The signal power at the receiver has to be maintained at a level less than or equal to 0.1 mW. Calculate the capacity of this channel.

ii) Explain in brief the procedure of encoding and decoding operation in linear block code.

c) i) Show that generator matrix G is the parity check matrix of dual code.

ii) Write a note on Binary Erasure channel.

SECTION-II

Q4) Attempt any Three of the following. **[18]**

a) Find the generator matrix and parity check matrix for Systematic (7, 4) Cyclic code. The primitive polynomial is $g(X) = 1 + X + X^3$.

b) Explain in brief the encoding and decoding procedure of Turbo code.

c) Explain the following terms in connection to convolution code:

i) Constraint length   ii) State diagram

d) What do you mean by cryptography? Explain symmetric cryptography technique.

Q5) Attempt any Two of the following. **[16]**

a) Design an encoder and Syndrome calculator for the (7, 4) Cyclic code generated by, $g(X) = X^3 + X + 1$ and verify it's operation using the message vector (0110).

Also Determine syndrome Vector for error pattern (0001000).

b) Determine the systematic code for (7, 3) RS double error correcting code using message (α^2, α^3, α^4) . Consider primitive polynomial $f(X) = 1 + X^2 + X^3$.

c) The Parity Check matrix of a (7, 4) linear Block code is given by,

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

Determine:

i) Generator matrix (G)

ii) All Code vectors

iii) Minimum distance

iv) Error detection and error correction capability

v) Show how syndrome helps in detecting & correcting error.

Q6) Attempt any two of the following. **[16]**

a) A Convolutional encoder using three shift registers and $r = 1/2$ has two generating vectors as: $g_1 = [1\ 0\ 1]$ and $g_2 = [0\ 1\ 1]$.

i) Sketch the encoder configuration

ii) If the message sequence is (0 1 0 1), determine the output sequence of the Encoder using time domain approach.

iii) Draw Code Tree and State diagram.

b) Write a note on:

i) Maximum likelihood decoding

ii) RSA Algorithm

c) Design a coder for (7, 3) BCH code for error correcting capability tc =1. Decode the received vector X^6.

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Seat No.

B.E. (Electronics) (Part-I) (Semester-VII) (Old) Examination, May - 2017
EMBEDDED SYSTEM DESIGN
Sub. Code : 47946

Day and Date : Monday, 15-05-2017　　　　　　　　　**Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

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

SECTION-I

Q1) Solve any three.　　　　　　　　　　　　　　　　　　　　　**[18]**

　　a)　Write suitable instruction to

　　　　i)　Return from Non-nested call

　　　　ii)　Return from nested call

　　　　iii)　Return from mode change due to SWI

　　　　iv)　Return from ISR due to IRQ

　　　　v)　Switch from ARM to THUMB state

　　　　vi)　Switch from THUMB to ARM state

　　b)　With suitable diagram explain switching of ARM from user mode to Fiq _ mode due to FIQ interrupt and back to user after serving ISR.

　　c)　With suitable example explain why and where return address is stored after execution of branch with link instruction, when and how return address is adjusted in link register.

　　d)　Why ARM offers pseudo instructions? Describe any two ARM pseudo instructions. What will be the ARM instruction generated by assembler for the following pseudo instructions.

　　　　i)　LDR R_0, = 42;

　　　　ii)　LDR R_1, = 0 × 55555555;

　　　　iii)　ADR r_1, value1

P.T.O.

Q2) Solve any two. [16]

a) Draw encoding of Conditional, Unconditional and long branch instruction offered by THUMB instruction set and explain range limits of branch addresses.

b) With suitable diagram explain method to switch from user mode to system mode return back to user mode.

c) Write short note on ARM data processing instructions.

Q3) Solve any two. [16]

a) Draw and explain flowchart of non-nested interrupt handler. What are the advantages and disadvantages of non-nested interrupt handler.

b) Write short note on exceptions in THUMB mode.

c) Write a subprogram which copies a 32 bit words from one memory location to another. The start of the source arry will be passed in r_1, the length (no of words) in r_2 and the start of the destination in r_3.

SECTION-II

Q4) Write answers to any four of following. [20]

a) Write a program in Embedded C for 8051, that converts a given 8 bit hex number in variable 'p' to a three digit decimal number 'xyz'. Hundreds digit of decimal number is represented by variable 'x', tens digit of decimal number is represented by variable 'y' and ones digit of decimal number is represented by variable 'z'.

b) Describe various data types defined in Embedded 'C' and are different from 'C' language.

c) Describe the terms CCLK and PCLK and their relation with crystal oscillator frequency, in contet with LPC 21xx series of microcontrollers.

d) Explain various registers those control the operation of GPIOs in LPC21xx.

e) Explain the differences between UART0 and UART1 of LPC2148 microcontroller.

Q5) Write answers to any two of following. [16]

    a)   Explain with neat block diagram the Architecture of LPC 21xx series of microcontrollers.

    b)   What are various system control blocks in LPC21XX? Explain the function of each block in short.

    c)   Explain various features of timers in LPC 21xx microcontroller.

Q6) Write answers to any two of following. [14]

    a)   Write a program in Embedded C, to generate a square wave on all pins of PORT0 of LPC 21xx microcontroller.

    b)   Explain the role of PIN connect block in LPC21xx microcontroller.

    c)   What are various data types in embedded C, associated with programming of 32 bit microcontroller.

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Seat No.	

B.E. (Electronics) (Part - I) (Semester - VII) (Revised) Examination, May - 2017
EMBEDDED SYSTEM DESIGN
Sub. Code : 67527

Day and Date : Tuesday, 16 - 05 - 2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**
       2)   **Figure to right indicate full marks.**
       3)   **Write answers to bits in questions at one place and in sequence. Do not place answers randomly.**
       4)   **Answers to the bits written randomly may not be assessed.**
       5)   **Write answers neatly and should be legible.**
       6)   **Draw diagrams neatly and giving appropriate labels and legends.**

SECTION - I

Q1) Solve any three: **[18]**

a)   What are advantages and disadvantages of coding using Machine coding, Assembly coding, C coding?

b)   Discuss important features observed in standard IDE (Integrated Development Environment).

c)   Write suitable instructions to perform following operations:

   i)   Return from non-nested call

   ii)   Return from nested call

   iii)   R0=R1*7

   iv)   Push register R0, R1, R, R3 on stack memory like 8085 stack operation

   v)   Loading constant 0xFF000000 in R0

   vi)   Load effective address of a variable 'Result' In R1.

d)   Explain with suitable diagram, how nested call is implemented in ARM CPU.

P.T.O.

Q2) Solve any two: [16]

a) With suitable example explain SWP instruction with suitable code, explain use of SWP instruction to handle semaphore in ARM system.

b) What is undefined mode of ARM? Why SWI and Undefined exception have same priority?

c) Write four assembly language codes to enabling and disabling FIQ and IRQ interrupts code in ARM assembly language.

Q3) Solve any two: [16]

a) With suitable diagram explain how SPI master communicate with, independent slaves and daisy chained slaves. What are advantages and disadvantages of each connection method?

b) What different frame types are in CAN bus? Discuss role of each frame.

c) Compare features of RS232 and RS485 communication protocol. Discuss advantages, disadvantages and applications of each.

SECTION - II

Q4) Answer any three of the following: [18]

a) Explain with Block diagram architecture of LPC214x series of Microcontroller.

b) Explain with block diagram role of Memory Acceleration Module on LPC 2148.

c) Explain role of Brown Out Detect facility provided on LPC 2148.

d) Explain various types of resets used on LPC 2148.

Q5) Answer any two of the following: **[16]**

   a) Explain with block diagram the UART0 on LPC 2148 microcontroller.

   b) Explain with block diagram how event capture (timer snapshot) can be taken using external input. Give an application example of such event capture.

   c) Write a short note on A to D converters available on LPC 2148.

   d) Explain the role of Boot loader on LPC 2148.

Q6) Answer any two of the following: **[16]**

   a) Explain different task scheduling algorithms.

   b) Explain working mechanism followed by Mutex.

   c) Explain role of mailboxes and message queues in inter task synchronization and communication.

Seat No.	

B.E. (Electronics Engineering) (Semester - VII) (Revised) Examination, May - 2017
BIOMEDICAL INSTRUMENTATION (Elective - I)
Sub. Code : 67532

Day and Date : Friday, 19 - 05 - 2017 **Total Marks : 100**
Time : 02.00 p.m. to 05.00 p.m.

Instructions : 1) **All Questions are compulsory.**
2) **Use suitable assumptions if required.**
3) **Draw necessary figures on right side of answer sheet.**

SECTION - I

Q1) Solve any three. **[18]**

a) What is the function of Cell? What are resting and action potentials?

b) Draw diagrams illustrating the process of respiration and circulation.

c) Name the different types of electrodes used for a Bio-medical Instrumentation system.

d) What is called Respiratory rate? How it can be measured?

Q2) Solve any two. **[16]**

a) What is mean by therapeutic equipment? Explain any one therapeutic equipment.

b) How electrical activity of human brain can be monitored explain in brief.

c) What is the frequency range of biomedical signals? Explain the requirements of recorder used for these signals.

Q3) Solve any two. **[16]**

a) With neat sketch explain electrodes used for EOG, ERG and EMG.

b) With suitable diagram explain electrodes tissue interface, contact impedance, and effects of high contact impedance.

c) With neat sketch explain physiology of musculoskeletal system.

P.T.O.

SECTION - II

Q4) Attempt any THREE. **[18]**

   a) What are different transducer selection factors for biomedical application.Explain with suitable example.

   b) State and describe different lungs volumes and lungs capacities. Give relationship between these parameters.

   c) Explain basic X-ray components.

   d) What are different safety standards applicable to medical instruments?

Q5) Attempt any TWO. **[16]**

   a) Explain with neat sketch the different methods used to measure blood pressure.

   b) What are different heart sounds? Explain how capacitive transducer is used to detect heart sounds.

   c) With neat block schematic, explain the working of EMG recording machine.

Q6) Attempt any TWO. **[16]**

   a) What is cardiac fibrillation ? Explain with neat diagram working of DC defibrillator.

   b) With suitable diagram explain 10-20 electrode system for measurement of EEG signal.

   c) Describe the working of image intensifier with detailed of diagram.

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Seat
No.

B.E. (Electronics) (Part-I) (Semester-VII) (Revised) Examination, May - 2017
COMPUTER NETWORK
Sub. Code : 67528

Day and Date : Wednesday, 17-05-2017   **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :   1)   **All questions are compulsory.**
                              2)   **Figures to the right indicate full marks.**
                              3)   **Assume necessary data wherever required.**

SECTION-I

Q1) Solve any two.   **[16]**

a)   What is bridge? What are its types? Explain Spanning tree algorithm with neat schematic.

b)   With a neat schematic explain GO-BACK-N ARQ technique for the lost frame Operation.

c)   Draw transition diagram of DHCP and explain its working.

Q2) Solve any two.   **[16]**

a)   With a suitable schematic explain Link State Routing protocol.

b)   Draw a frame format of IEEE 802.3 & explain each field.

c)   Compare TCP/IP reference model with OSI model.

Q3) Write short notes on (any three).   **[18]**

a)   CSMA/CA technique

b)   i)   Hub   ii)   Router

c)   IPV -6 header format

d)   Dijkstra algorithm

P.T.O.

Q4) Solve any two of the following. **[18]**

a) What are the contents of TCP header? Expalin each In detail.

b) "Transport layer is responsible for process to process delivery". Justify the statement in detail.

c) Explain how congestion control is achieved in transport layer.

Q5) Solve any two of the following. **[16]**

a) Draw and explain DNS protocol.

b) With suitable example explain SMTP protocol.

c) With suitable example explain FTP protocol.

Q6) Solve any two of the following. **[16]**

a) State and explain basics of security attacks.

b) Enlist algorithms for network security. Expalin in detail secret key algorithm.

c) State and explain application of digital signature.

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