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B.E. (Electronics Engg.) (Part - IV) (Semester - VII) (Revised)
Examination, November - 2017

INFORMATION THEORY AND CODING TECHNIQUES

Sub. Code : 67526

Day and Date : Friday, 10 - 11 - 2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 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) Prove the following relationship:
 - i) $I(Y, X) = H(Y) - H(Y/X)$
 - ii) $H(XY) = H(X/Y) + H(Y)$
- b) What do you mean by Binary Erasure channel? Determine the capacity of binary erasure channel, whose channel matrix is given by,

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

- c) Explain the encoding & decoding procedure for (n, k) linear block code.
- d) State Shannon Hartley theorem. Prove that maximum Channel Capacity is given by, $C_\infty = \lim_{B \rightarrow \infty} C = 1.44 [S/N_0]$

$$B \rightarrow \infty$$

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

- a) i) Determine the parity check matrix (H) for (5, 3) code. Show that $GH^T = 0$ & $CH^T = 0$ for $C = [1 \ 1 \ 0 \ 1 \ 0]$. The generator matrix is

$$\text{given as, } G = \begin{bmatrix} 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \end{bmatrix}$$

P.T.O.

- ii) What is entropy coding? Explain the procedure for Huffman coding algorithm.
- b) A discrete source transmits message X_1 , X_2 and X_3 with probabilities $P(X_1) = 0.3$, $P(X_2) = 0.25$ and $P(X_3) = 0.45$ respectively. The source is connected to channel whose conditional probability matrix is,

$$P[Y/X] = \begin{matrix} & \begin{matrix} Y_1 & Y_2 & Y_3 \end{matrix} \\ \begin{matrix} X_1 \\ X_2 \\ X_3 \end{matrix} & \begin{bmatrix} 0.9 & 0.1 & 0 \\ 0 & 0.8 & 0.2 \\ 0 & 0.3 & 0.7 \end{bmatrix} \end{matrix}$$

Calculate all the entropies and mutual information with this channel.

- c) i) Explain the distance properties of linear block code.
- ii) A Gaussian channel has a bandwidth of 1 MHz. Calculate the channel capacity if the signal power to noise spectral density ratio is 10^5 Hz. Also calculate the maximum information rate.

Q3) Solve any two of the following.

[16]

- a) A parity check matrix (H) of a (7, 4) linear block code is given by,

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

Determine:

- Generator matrix (G)
- All Code vectors
- Minimum distance
- Error detection & correction capability.
- Show that how syndrome vector helps in detecting & correcting the error

- b) Apply Shannon-fano Coding procedure for the following message ensemble:

$$[X] = [X_1 \quad X_2 \quad X_3 \quad X_4 \quad X_5 \quad X_6 \quad X_7]$$

$$P[X] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.08 \quad 0.04]$$

Determine the entropy of source, average code word length, Coding efficiency & redundancy.

- c) i) State and explain the properties of mutual information.
- d) The channel matrix is given by,

$$\begin{bmatrix} 0.9 & 0.1 \\ 0.2 & 0.8 \end{bmatrix}$$

- i) Draw the channel diagram
- ii) Determine the probabilities associated with outputs assuming equiprobable inputs.

SECTION - II

Q4) Attempt any three from the following:

[18]

- a) Determine the generator matrix and parity check matrix for Systematic (7, 4) Cyclic code for the given generator polynomial is, $g(x) = X^3 + X^2 + 1$.
- b) What is convolutional code? Explain the time domain approach for generating output code sequence in convolutional code.
- c) State the features of BCH code. Explain the decoding procedure for BCH code.
- d) Determine the generator polynomial, code polynomial & code for (7, 3) RS double error correcting code for message vector $(\alpha^2, \alpha^3, \alpha^4)$ using systematic form method.

Q5) Attempt any Two of the following: [16]

- a) Determine the generator polynomial for t error correcting BCH code for the extension field $GF(16)$ with the primitive polynomial $X^4 + X + 1$ over $GF(2)$ and error correcting capability $t_c = 1, 2$.
- b) A Convolutional encoder using three shift registers and $r = 1/2$ has two generating vectors are as : $g_1 = [1 \ 0 \ 1]$, $g_2 = [1 \ 1 \ 1]$
 - i) Sketch the encoder configuration
 - ii) Determine generator matrix (G)
 - iii) If the message sequence is $(1 \ 0 \ 0 \ 1)$, determine the output sequence of the encoder.
 - iv) Draw Code tree and State diagram.
- c) Write a short note on the following.
 - i) Maximum likelihood decoding
 - ii) Minimum Polynomial

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

- a) Determine the generator polynomial for $(7, 5)$ RS code over $GF(8)$ if the message vector is $\{\alpha^0, 0, \alpha^3, \alpha^4\}$ and error polynomial $e(x) = \alpha^4 X^4$. Also find code vector $C(x)$ & received vector $r(x)$. Verify whether decoding of $r(x)$ results into $C(x)$.
- b) Design an encoder and Syndrome calculator for the $(7, 3)$ Cyclic code generated by, $g(X) = X^4 + X^2 + X + 1$ and verify its operation using the message vector $(1 \ 1 \ 0)$. Also determine syndrome Vector for the error pattern (0100000) .
- c)
 - i) Why the need of error control coding? State the difference between block code & Convolutional code.
 - ii) What is cyclic redundancy check code? Explain the procedure to obtain CRC code.



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B.E. (Electronics) (Part - IV) (Semester - VII) (Revised)**Examination, November - 2017****EMBEDDED SYSTEM DESIGN****Sub. Code : 67527****Day and Date : Monday, 13-11-2017****Total Marks : 100****Time : 2.30 p.m. to 5.30 p.m.**

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

SECTION - I**Q1) Solve any three (Six marks for each question) [18]**

- a) Define embedded system. What are important characteristics of embedded system?
- b) With suitable block diagram explain process of converting assembly language program into machine implementable software.
- c) With suitable diagram explain switching of ARM from user mode to Fiq_mode due to FIQ interrupt and back to user after serving ISR.
- d) Fill “*” in the table below with suitable words and 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?

| Cycle | | | | 1 | 2 | 3 | 4 | 5 |
|---------|-----------|---|---|---|---|---|---|---|
| Address | Operation | | | | | | | |
| 0x8000 | BL | * | * | * | * | * | | |
| 0x8004 | X | | * | * | | | | |
| 0x8008 | XX | | | * | | | | |
| 0x8FEC | ADD | | | | * | * | * | |
| 0x8FF0 | SUB | | | | | * | * | * |
| 0x8FF4 | MOV | | | | | | * | * |

P.T.O.

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

- a) Write short note on ARM data processing instructions.
- b) Draw and explain flowchart of non-nested interrupt handler. What are the advantages and disadvantages of non-nested interrupt handler
- c) Write an assembly language code, which copies a 32 bit words from one memory location to another. The address of start of the source array is in r1, the length (no of words) in r2 and the start of the destination address in r3. (Use of necessary assembler directives is essential in the program).

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

- a) With suitable timing diagram discuss how clock synchronization achieved in 12C Bus?
- b) List five error types of CAN bus. Explain Stuffing error in detail.
- c) Draw and explain frame format of 12C bus for master transmitter addressing slave and writing two bytes on slave and slave receives all bytes successfully.

SECTION - II

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

- a) Explain with diagram the memory map of LPC 2148 Microcontroller.
- b) Explain the role of various buffers in Memory Acceleration Module (MAM) and operation modes of MAM.
- c) Describe with diagram the oscillator selection algorithm for LPC 2148.
- d) Explain various types of resets used on LPC 2148.

Q5) Answer any two of the following

- a) Explain the registers associated with the GPIOs on LPC 2148.
- b) Explain with block diagram the UART1 on LPC 2148 microcontroller.
- c) Explain with Block diagram PWM unit on LPC 2148 Microcontroller.
- d) Describe the role of ADC global Data register and ADC channel data register and differentiate between them.

Q6) Answer any two of the following

[16]

- a) Explain role of RTOS in development of high end microcontroller based systems.
- b) Explain different task scheduling algorithms.
- c) Explain role of Pipe in inter task communication.



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B.E. (Electronics) (Part - IV) (Semester - VII) (Revised)**Examination, November - 2017****COMPUTER NETWORK****Sub. Code: 67528****Day and Date : Wednesday, 15 - 11- 2017****Total Marks : 100****Time : 2.30 p.m. to 6.30 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) Compare microwave, infrared wave & radio wave transmission media.
- b) What are different types of random access methods? Explain CSMA/CD technique.
- c) With a neat schematic explain token bucket algorithm.

Q2) Solve any two: [16]

- a) Draw header format of IPV4 datagram and explain all fields.
- b) What are the drawbacks of STOP and WAIT protocol? Explain the operation of Selective Repeat ARQ technique for lost frame.
- c) With a suitable schematic explain working principle of Bellman Ford algorithm.

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

- a) Addresses in IPV6.
- b) HDLC.
- c) Bridge.
- d) Sub netting and super netting.

P.T.O.

SECTION-II

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

- a) What are the contents of TCP segment? Explain each in detail.
- b) Draw and explain various TCP timers.
- c) With suitable example explain DNS protocol.

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

- a) Draw and explain SMTP protocol.
- b) State and explain application of message integrity and authentication.
- c) Explain how process to process delivery is achieved in transport layer.

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

- a) State and explain cryptography.
- b) What are the security attacks? Explain each in detail.
- c) With suitable example explain TELNET protocol.

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B.E. (Electronics) (Semester - VII) (Revised)
Examination, November - 2017
IMAGE PROCESSING
Sub. Code: 67529

Day and Date :Tuesday, 21 - 11 - 2017

Total Marks : 100

Time :2.30 p.m. to 5.30 p.m.

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

Q1) Attempt any Four : **[20]**

- a) Describe various types of pixel adjacency.
- b) Explain spatial and intensity resolution of an image.
- c) Explain types of interpolation method.
- d) Explain Contrast stretching used in Image processing.
- e) Describe different types of distance used in Image processing.

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

- a) Explain various fundamental steps in digital image processing.
- b) Describe different components used in image processing system.
- c) Explain different types of image sensors used for image acquisition.

Q3) Attempt any Two: **[14]**

- a) Explain Negative and Power law transformation.
- b) What is Histogram? Explain histogram equalization process with an example.
- c) Explain image averaging & Image subtraction for image enhancement.

P.T.O.

Q4) Attempt any Four:**[20]**

- a) Explain basics of spatial filtering.
- b) Explain average filtering of an image.
- c) Explain median filter with an example.
- d) Explain CMY color model.
- e) Explain concept of Gradient operator used for image enhancement.

Q5) Attempt any Two :**[16]**

- a) Explain how to detect various gray level discontinuities in digital image.
- b) Describe Thresholding and Write an algorithm used for global Thresholding.
- c) What is region based segmentation. ? Write basic region growing algorithm.

Q6) Attempt any Two :**[14]**

- a) Explain RGB color model.
- b) Explain gray level to color transformations.
- c) Explain converting colors from RGB to HSI Model and vice versa.



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

Day and Date :Thursday, 23 - 11 - 2017**Total Marks : 100****Time :2.30 p.m. to 5.30 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 what is meant by frequency reuse?
- b) Draw and explain the term sun transit outage.
- c) Frequency allocation technique in satellite communication.
- d) What is an orbit?
- e) Explain the term apogee and perigees.
- f) What is reliability of communication satellite.

Q2) Solve any two:**[2×8=16]**

- a) Explain attitude + orbit control system (AOCS) of satellite.
- b) What are Kepler's three laws of planetary motion? Also explain the parameters to describe the satellite orbit.
- c) What do you mean by transponder? Explain double conversion transponder system.

P.T.O.

Q3) Solve any three:**[3×6=18]**

- a) Draw block diagram of spacecraft communication system and explain.
- b) Write short note on antennas used in satellite communication system.
- c) Explain the term redundancy.
- d) Write short note on application of satellite communication
- e) Define power system in satellite communication.

Q4) Solve any Four:**[4×4=16]**

- a) Explain in brief Link Budget.
- b) Explain GPS navigation message.
- c) Draw and explain signal format of VSAT inbound signal.
- d) Define Effective isotropically radiated power.
- e) Explain one-way implementation of VSAT network architecture.
- f) What is Link performance?

Q5) Solve any Two:**[2×8=16]**

- a) Draw and explain schematic of a typical Hub master control earth station.
- b) 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 angle of 28°. What is the earth station G/T ratio under these conditions?
- c) What is GPS position location principle? With a block diagram explain workings of a GPS receiver.

Q6) Solve any Three:**[3×6=18]**

- a) Write the design procedure for satellite communication link.
- b) State different types of codes used in GPS? Explain any one code in detail.
- c) Explain different types of antennas used in VSAT systems.
- d) Write a note on satellite signal acquisition.
- e) Draw and explain protocol architecture of a star VSAT network.



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**B.E. (Electronics Engineering) (Semester - VII) (Revised)
Examination, November - 2017**

BIOMEDICAL INSTRUMENTATION (Elective - I)

Sub. Code: 67532

Day and Date :Thursday, 23 - 11 - 2017

Total Marks : 100

Time :2.30 p.m. to 5.30 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 sodium pump? Explain Elementary ideas of cell structure.
- 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) Explain in brief heart and circulatory system.

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

- a) What is mean by diagnostic equipment? Explain any one diagnostic equipment.
- b) With suitable diagram explain electrodes tissue interface, contact impedance, and effects of high contact impedance.
- 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 ECG, EEG and EMG.

P.T.O.

- b) How electrical activity of human eye can be monitored explain in brief.
- c) With neat sketch explain physiology of central nervous system.

SECTION-II

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

- a) With neat diagram explain the Spirometer working principle.
- b) List the different types of amplifier used in biomedical instrumentation. Explain any one in detail.
- c) Explain various methods of blood pressure measurements.
- d) Classify different transducers used for detection of physiological parameters.

Q5) Attempt any Two: **[16]**

- a) Explain ECG leads system with typical waveform for _____.
 - i) Unipolar limb leads
 - ii) Bipolar limb leads
- b) With neat sketch explain the working principle of ultrasound blood flow meter.
- c) What are different preventive measures to reduce shock hazards.

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

- a) Describe in detail the physiological effects of electric current on human body.
- b) Explain in brief the working principle of LVDT. Describe how it can be employed to measure the muscle movement?
- c) Explain in detail the working and characteristics of following amplifiers...
 - i) Differential Amplifier.
 - ii) Carrier amplifier.



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B.E. (Electronics) (Part - IV) (Semester - VIII)**Examination, November - 2017****MICROWAVE ENGINEERING****Sub. Code : 67777****Day and Date : Wednesday, 01 - 11 - 2017****Total Marks : 100****Time : 10.00 a.m. to 1.00 p.m.**

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

SECTION - I**Q1) Attempt any two questions : [16]**

- a) Explain with suitable equations TE mode equations for a rectangular waveguide.
- b) What is magnetron oscillator? Explain in detail operation of cavity magnetron.
- c) An air-filled rectangular waveguide of inside dimensions 7×3.5 cm operates in the dominant TE_{10} mode.
 - i) Find the cutoff frequency.
 - ii) Determine the phase velocity of the wave in the guide at a frequency of 3.5 GHz.
 - iii) Determine the guided wavelength at the same frequency.

Q2) Attempt any two questions : [16]

- a) With suitable example explain MMIC fabrication process.
- b) Explain in detail operation of isolator with suitable diagram.
- c) An air filled waveguide with a cross section 2×1 cm transports energy in the TE_{10} mode at the rate of 0.5 hp. The impressed frequency is 30 GHz. What is the peak value of the electric field occurring in the guide?

P.T.O.

Q3) Write short notes on any three :

[18]

- a) Microwave Hazards.
- b) FWCFA.
- c) Excitation modes in waveguides.
- d) Electromagnetic compatibility.

SECTION - II

Q4) Attempt any two of following :

[16]

- a) Draw and explain V-I characteristic of tunnel diode with applications.
- b) Explain how tunneling action takes place in tunnel diode. What are it's applications?
- c) Describe the operating principles with characteristics of the IMPATT diode.

Q5) Attempt any two of the following :

[16]

- a) Explain in detail procedure for measurement of VSWR with block diagram.
- b) Explain in detail high power measurement calorimeter method.
- c) Define attenuation and insertion loss. Explain substitution method for attenuation measurement.

Q6) Attempt any three of following :

[18]

- a) Explain directivity and beam width of slotted antenna.
- b) Explain horn antenna with all type of feeding methods.
- c) Write note on LENS antenna.
- d) Write note on micro strip antenna and it's radiation mechanism.



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B.E. (Electronics) (Semester - VIII) (Revised)
Examination, November - 2017
WIRELESS COMMUNICATIONS NETWORK
Sub. Code: 67778

Day and Date :Thursday, 02 - 11 - 2017

Total Marks : 100

Time :10.00 a.m. to 1.00 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) How coverage and capacity in cellular systems can be improved? Explain various methods.
- b) Explain three types of dedicated control channels in GSM.
- c) If a signal to interference ration of 15dB is required for satisfactory forward channel performance of a cellular system what is frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is
 - i) $n = 4$
 - ii) $n = 3$

Assume that 6 co-channel cells in the first tier and all of them are at same distance. Use suitable approximations.

- d) Explain the various types of Handoff processes available.

Q2) Solve any two. [16]

- a) Explain the GSM system architecture with neat sketch.
- b) Compare between FDMA, TDMA, SDMA.
- c) Explain the GSM protocol stack

P.T.O.

Q3) Solve any two.

[16]

- a) Draw and Explain the Frame structure for GSM.
- b) Explain challenges in front of Wireless Communication.
- c) Explain co-channel Interference and Adjacent-channel Interference. How it can be reduced?

SECTION-II

Q4) Write a short note on any three.

[18]

- a) Wireless Datagram Protocol
- b) EDGE
- c) Piconet & scatternet
- d) WML

Q5) Attempt any two

[16]

- a) Explain Advantages and Disadvantages of IR LAN.
- b) Explain functions and components of Wireless Application Protocol (WAP) architecture.
- c) Explain IEEE 802.11 Architecture with neat diagram.

Q6) Attempt any two.

[16]

- a) How security is offered in Bluetooth? Explain with flowchart.
- b) Draw and explain CDPD architecture.
- c) Discuss GPRS architecture reference model.



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B.E. (Electronics) (Part-IV) (Semester-VIII)**Examination, November - 2017****POWER ELECTRONICS & DRIVES****Sub. Code :67779****Day and Date : Friday, 03- 11 - 2017****Total Marks : 80****Time : 10.00 a.m. to 1.00 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.
 - 4) Use of non programmable calculator is allowed.

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

- a) Explain the working of three phase semiconverter with neat diagram and waveforms for $\alpha = 90^\circ$. Derive the equation for V_{dc} & V_{rms} for $\alpha \geq \pi/3$.
- b) A three-phase fully-controlled bridge converter is connected to three-phase a.c. Supply of 400V, 50 Hz and operates with a firing angle $\alpha = \pi/4$. The load current is maintained constant at 10 Amp and the load voltage is 360 Volts. Compute.
 - i) Source inductance, L_s
 - ii) Load resistance R .
 - iii) Overlap angle μ ,
- c) With neat circuit diagram and waveform explain the operation of three-phase Half wave controlled rectifier for continuous conduction. Derive the equation for V_{dc} & V_{rms} when firing angle $\alpha < \pi/6$.

P.T.O.

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

- a) Draw the circuit diagram & waveform of IGBT based single phase full bridge inverter. Also derive the equation for the rms output voltage.
- b) Explain in detail 120° mode of conduction of three phase IGBT based inverter.
- c) Compare CSI & VSI inverters in details.

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

- a) Explain single phase cycloconverter which divides the supply frequency by three.
- b) Compare circulating & non circulating mode operation of cycloconverter.
- c) Explain three phase to three phase cycloconverter along with circuit diagram.

SECTION - II

Q4) Solve any two. [16]

- a) Draw & explain block diagram of Electric drive.
- b) Explain speed control of separately excited DC motor using single phase full controlled converter with appropriate waveform.
- c) Explain stator voltage control technique used for speed control of induction motor.

Q5) Solve any two. [16]

- a) Compare A.C. & D.C. drives.
- b) A d.c. shunt motor takes a current of 80A on a 480v supply and runs at 960rpm. The armature resistance is 0.25Ω and the field resistance is 120Ω . A chopper is used to control the speed of the motor in the range of 400-750rpm having constant torque. The on period of the chopper is 3ms. The field is supplied directly from 480v supply. Determine the range of frequencies of the chopper.
- c) Explain the variable frequency speed control of an induction motor.

Q6) Write note on any three.

- a) Star-delta starter.
- b) Dynamic breaking in D.C. Motor.
- c) Selection criteria of a electric drive.
- d) Types of 3 phase induction motors.



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B.E. (Electronics) (Semester-VIII)**Examination, November - 2017****HIGH PERFORMANCE COMPUTER NETWORK (Elective - II)****Sub. Code : 67786****Day and Date : Monday, 06-11-2017****Total Marks : 100****Time : 10.00 a.m. to 1.00 p.m.**

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

SECTION-I**Q1) Attempt any two: [18]**

- a) Draw and explain frame format for (IEEE 802.3) Ethernet.
- b) With neat sketch explain SMDS.
- c) Draw and explain frame format for (IEEE 802.5) Token Ring.

Q2) Attempt any two: [16]

- a) State and explain various ISDN functional groupings.
- b) State and explain ISDN interfaces.
- c) Explain B-ISDN protocol Architecture.

Q3) Attempt any two: [16]

- a) Why various types of AAL'S required in ATM? Explain it in detail.
- b) Draw and explain ATM cell header for UNI.
- c) Explain ATM switching building blocks.

P.T.O.

SECTION-II

Q4) Attempt any two: [18]

- a) With neat diagram explain WDM system.
- b) Discuss in detail optical paths and networks.
- c) Explain in detail Multiprotocol Label Switching (MPLS).

Q5) Attempt any two: [16]

- a) Explain in detail Resource Reservation protocol (RSVP).
- b) Explain in detail optical cross connects.
- c) Discuss in detail congestion control in frame relay.

Q6) Attempt any two: [16]

- a) State and explain frame relay protocol.
- b) Describe frame relay interworking with Internet.
- c) Discuss in detail frame relay via ATM.



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**B.E. (Electronics Engg.) (Part -IV) (Semester - VIII) (Old)
(prerevused) Examination, November - 2017**

MICROWAVE ENGINEERING

Sub. Code :49436

Day and Date : Friday, 03 - 11 - 2017

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

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

SECTION - I

Q1) Attempt any two of the following: [16]

- a) Explain electron motion in magnetic field.
- b) What is reflection coefficient and transmission coefficient of transmission line? Derive the expression for the same
- c) What do you mean by voltage standing wave ratio? What is its significance?

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

- a) Explain the modes of operation in case of rectangular wave guide. Explain the losses in the waveguide.
- b) A rectangular waveguide measures 3×4.5 cm with 9 GHz signal propagating Find
 - i) Cut off wavelength
 - ii) Guide wavelength
 - iii) Characteristic wave impedance for TE_{10} mode
- c) With the help of suitable diagram explain operation of hybrid T junction. What are its applications?

P.T.O.

Q3) Attempt any three of the following: [18]

- a) Explain the velocity modulation in bunching formation in case of Klystrons amplifier
- b) Describe construction and working of Magnetron as oscillator
- c) Explain the importance of directional coupler
- d) Write note on travelling wave tube (TWT)

SECTION - II

Q4) Attempt any two of the following: [16]

- a) Draw and explain V-I characteristic of Tunnel diode. Explain how tunneling occurs.
- b) Explain the operation of IMPATT diode as oscillator. How avalanche multiplication occurs.
- c) Explain three valley models for Inp diode

Q5) Attempt any two of the following: [16]

- a) With suitable example explain MMIC fabrication process.
- b) Explain LSA diode
- c) Explain anechoic chambers and microwave clean rooms.

Q6) Attempt any three of the following: [18]

- a) Explain the method of converting receiving voltage to electric field intensity.
- b) Write note on Microwave hazards.
- c) Write note on Electromagnetic compatibility.
- d) Write note on plane wave propagation in shielded room.

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B.E. (Electronics) (Semester - VIII) (Elective - II) (Old)**Examination, November - 2017****BROADBAND COMMUNICATION
(Revised Syllabus w.e.f. from 2010-2011)****Sub. Code : 49437****Day and Date : Monday, 6-11-2017****Total Marks : 100****Time : 10.00 a.m. to 1.00 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) Discuss in detail switching technologies and signaling for switching networks.
- b) Draw and explain the Basic SONET Frame structure.
- c) What are possible configurations for ISDN user interface network? Explain one in details.

Q2) Attempt any two [16]

- a) Write a short note on B-ISDN services.
- b) Explain in detail B-ISDN protocol reference model.
- c) What are ISDN connections for end to end communication? Explain one of them.

Q3) Attempt any two [16]

- a) Give comparison between packet switching and circuit switching
- b) Explain in detail ISDN Protocol Architecture
- c) Explain in detail LAPF frame format.

P.T.O.

SECTION-II

Q4) Attempt any two [16]

- a) Write a short note on Frame Relay Technology.
- b) Draw and explain the ATM switch.
- c) Why various types of AAL's required in ATM Networks? Explain example of AAL5 transmission.

Q5) Attempt any two [16]

- a) Differentiate between ISDN, Frame Relay and ATM.
- b) Draw and explain the ATM protocol Stack. Comment on the significance of AAL Layer.
- c) State & explain various traffic descriptors.

Q6) Write short notes (Attempt any two) [18]

- a) SS7 control plane and information plane.
- b) Comparison X.25, TCP/IP reference model, and ISDN at Network layer.
- c) Benefits of VoIP and IP Telephony.

