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**B.E. (Electronics) (Part-IV) (Semester-VIII) Examination, May - 2018**

**MICROWAVE ENGINEERING**

**Sub. Code: 67777**

Day and Date : Friday, 04 - 05 - 2018

Total Marks : 100

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

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

**SECTION-I**

**Q1) Attempt any two questions : [16]**

- a) Explain with suitable equations TM mode equations for a rectangular waveguide.
- b) What is TWT? Explain in detail operation of TWT.
- c) When the dominant mode is propagated in an air filled rectangular waveguide, the guide wavelength for a frequency of 9000 Mhz is 4 cm. Calculate breadth of the guide?

**Q2) Attempt any two questions : [16]**

- a) With suitable example explain MMIC fabrication process.
- b) Explain in detail operation of circulator with suitable diagram.
- 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?

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

- a) Velocity modulation Process
- b) BWCFA
- c) Power losses waveguides
- d) Anechoic chambers

**P.T.O.**

SECTION-II

- Q4) Attempt any two of the following : [16]
- Explain how tunneling action takes place in tunnel diode. What are its applications?
  - Explain CdTe diodes
  - Explain construction detail, operating principle and energy band diagram of HEMT.
- Q5) Attempt any two of the following : [16]
- Explain power ratio method and substitution method for attenuation measurement.
  - Explain in detail high power measurement calorimeter method.
  - Explain reflectometer method for impedance measurement.
- Q6) Attempt any three of the following : [18]
- Explain horn antenna with all type of feeding methods.
  - Define and explain the terms :
    - SWR
    - Antenna gain
    - Band width
    - Directivity
  - Explain various feed technique for parabolic reflector
  - Explain LENS antenna and list the advantages and disadvantages of dielectric lens.



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**B.E. (Electronics Engineering) (Semester - VIII)  
(Pre-revised Syllabus) Examination, May - 2018  
WIRELESS COMMUNICATION NETWORK  
Sub. Code: 67778**

Day and Date : Monday, 07 - 05 - 2018

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.

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

- a) What is handoff? Explain the various types of Handoff processes available.
- b) Assume that 50 MHz is available for forward channels, and you will deploy GSM. Each channel is 200 kHz, but using TDMA, 8 simultaneous calls can be made on each channel. How large is  $k$ ? How many forward calls can be made simultaneously for the cellular system with  $N=4$ .
- c) Explain the Signal processing in GSM.
- d) Explain the Challenges in wireless networking.

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

- a) Draw and Explain the Frame structure for GSM.
- b) Compare between FDMA, TDMA, and CDMA.
- c) Compare 2G and 3G wireless Networks.

**P.T.O.**



Q3) Solve any two:

- a) Explain the GSM system architecture with neat sketch.
- b) Differentiate Fixed and Dynamic channel assignment strategies.
- c) Explain in detail cell splitting and Sectoring. Define co-channel reuse ratio in detail.

Q4) Attempt any two:

[16]

- a) Compare single cell WLAN configuration with multiple cell WLAN configuration.
- b) Explain functions and components of the WAP architecture.
- c) What is MESS, MDBS, MDIS & CDPD handover in concern with CDPD architecture?

Q5) Attempt any two:

[16]

- a) What are different frames used in IEEE 802.11. Explain its use with formats.
- b) What is WML? Explain its features in detail.
- c) Draw neat diagram of GPRS system architecture and explain it in detail.

Q6) Write notes on (Any Three):

[18]

- a) Wireless Datagram Protocol.
- b) EDGE.
- c) Bluetooth device addresses.
- d) Infrastructure based and ad hoc networks.

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**B.E. (Electronics) (Part - IV) (Semester - VIII)**  
**Examination, May - 2018**  
**POWER ELECTRONICS & DRIVES**  
**Sub. Code: 67779**

Day and Date : Friday, 11 - 05 - 2018  
 Time : 2.30 p.m. to 5.30 p.m.

Total Marks : 100

- 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 semiconvertor with neat diagram and wave form for  $\alpha \leq \pi/3$ . Derive the equation for vdc and vrms for  $\alpha \leq \pi/3$ .
- b) A three-phase fully-controlled bridge converter is connected to 415V. Supply, having a reactance of  $0.3\Omega$  phase and resistance of  $0.05\Omega$ / phase. The converter is working in the inversion-mode at a firing advance angle of  $35^\circ$ . Compute the average generator voltage. Assume  $I_d = 60A$  and thyristor drop = 1.5V.
- c) With neat circuit diagram & waveforms explain the effect of source Inductance on the performance of 3 phase full converter.

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

- a) Explain in detail  $120^\circ$  mode of conduction of three phase IGBT based inverter.
- b) Explain the different harmonic reduction, reduction techniques in three phase inverter.
- c) List out the voltage control methods for three phase inverters and explain any one in detail.

**P.T.O.**

**Q3) Solve any two of the following:**

[16]

- Draw and explain single phase to single phase cyclo converter for non circulating mode operation.
- Draw and explain three phase to single phase cyclo converter for circulating current mode operation. Also draw wave forms.
- Discuss in details the harmonic reduction techniques for cyclo converter along with waveforms.

**SECTION - II**

**Q4) Solve any two:**

[16]

- Compare A.C. & D.C. drives.
- Explain speed control of separately excited DC motor using chopper controlled D.C. drive with appropriate waveform.
- Explain speed control of induction motor by static rotor resistance control.

**Q5) Solve any two:**

[16]

- What are different types of D.C. motors depending on field connections. Explain the performances.
- A 200V motor (separately excited) runs at 1500rpm at no load. When armature draws full load current of 20 Amp. Assume that at no load armature current is zero & armature resistance  $R_a = 1\Omega$ . Then find the duty cycle (ratio) for  $N = 1000\text{rpm}$ , I/P voltage of D.C. chopper is 200V.
- Name different braking methods used in induction motor? Explain dynamic braking system in detail with circuit diagram.

**Q6) Solve any three:**

[18]

- Explain rotor resistance starter.
- Draw & explain static scherbius drive along with speed torque curves.
- Types of 3 phase induction motors.
- Explain the operation of a four quadrant chopper DC drive.





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**B.E. (Electronics) (Semester - VIII) Examination, May - 2018**  
**HIGH PERFORMANCE COMPUTER NETWORK (Elective - II)**  
**Sub. Code : 67786**

Day and Date : Monday, 14 - 05 - 2018

Total Marks : 100

Time : 02.30 p.m. to 05.30 p.m.

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

**SECTION - I**

**Q1)** Solve any two of the following : [16]

- Draw and explain OSI and TCP-IP Model.
- Discuss in detail SMDS.
- Draw and explain frame format for IEEE 802.5.

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

- Explain in detail ISDN BRI and PRI Interface.
- Draw and explain Broadband ISDN protocols and architecture.
- Discuss in detail Signaling System 7 (SS7).

**Q3)** a) Draw and explain ATM cell header for UNI.  
b) Draw and explain VP and VC switching in ATM.  
c) State and explain AAL Layers in ATM.

[18]

*P.T.O.*

SECTION - II

**Q4)** Solve any two of the following : [16]

- a) Discuss in detail frame relay protocols.
- b) Explain in detail congestion control related to frame relay.
- c) State and explain concept of frame relay Via ATM.

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

- a) Draw and explain concept of optical Paths and networks.
- b) Discuss in detail WDM Systems.
- c) Draw and explain in detail optical cross - connects.

**Q6)** a) Draw and explain Multi Protocol Label Switching (MPLS). [9]

b) State and explain in detail Resource Reservation Protocol (RSVP). [9]





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**B.E. (Electronics Engg.) (Semester - VII)**

**Examination, April - 2018**

**INFORMATION THEORY AND CODING TECHNIQUES (Revised)**

**Sub. Code : 67526**

**Day and Date : Tuesday, 24 - 04 - 2018**

**Total Marks : 100**

**Time : 02.30 p.m. to 05.30 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) Determine the parity check matrix H for the (5, 3) code. Show that  $GH^T=0$  and  $C.H^T=0$  for  $C=(1\ 10\ 10)$  and Generator matrix is given as,

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

- b) What do you mean by joint & Conditional entropy? Derive relation between joint and conditional entropies.
- c) State the Shannon channel capacity theorem. Show that the maximum channel capacity is given by,

$$C_{\infty} = \lim_{B \rightarrow \infty} C = 1.44 [S / N_0]$$

**P.T.O**

d) A Channel has the following channel matrix,

$$\begin{pmatrix} 1-P & P & 0 \\ 0 & P & 1-P \end{pmatrix}$$

- i) Draw the channel diagram.
- ii) If the source has equally likely output, compute the probabilities associated with channel output for  $p = 0.2$

Q2) Attempt any Two of the following [16]

- a)
  - i) What is entropy coding? Explain procedure for Shannon Fano Coding algorithm.
  - ii) An AWGN Channel has bandwidth of 4 KHz and noise power spectral density ( $N_0/2$ ) is  $10^{-12}$  W/Hz, the signal power required at the receiver is 0.1 mW. Calculate the capacity of the channel.
- b) A discrete source transmits message  $X_1, X_2$  and  $X_3$  with probabilities  $P(X_1) = 0.3, P(X_2) = 0.25, P(X_3) = 0.45$  respectively. The Source is connected to the channel whose conditional probability matrix is,

$$P[Y/X] = \begin{matrix} & \begin{matrix} Y_1 & Y_2 & Y_3 \end{matrix} \\ \begin{matrix} X_1 \\ X_2 \\ X_3 \end{matrix} & \begin{pmatrix} 0.8 & 0.2 & 0 \\ 0 & 0.6 & 0.4 \\ 0 & 0.2 & 0.8 \end{pmatrix} \end{matrix}$$

Calculate all the entropies and mutual information of this channel.

c) In an Linear Block Code, the Syndrome is given by,

$$S_1 = r_1 + r_2 + r_3 + r_5$$

$$S_2 = r_1 + r_2 + r_4 + r_6$$

$$S_3 = r_1 + r_3 + r_4 + r_7$$

- i) Determine Parity Check Matrix (H) and Generator Matrix (G)
- ii) Draw the encoder circuit.
- iii) Determine the code word for all message sequences.
- iv) How many errors it can detect & correct?
- v) Determine the syndrome vector for the received code word (1 0 1 10 1 1)

Q3) Attempt any Two of the following

[16]

- a) Determine the average length of coded message and coding efficiency using Shannon Fano Coding & Huffman's Coding for the following message ensemble:

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

$$P [X] = [ 0.4 \quad 0.19 \quad 0.16 \quad 0.15 \quad 0.10 \quad ]$$

Compare and Comment on the result.

- b) i) What is mutual information? State the properties of mutual information.  
 ii) Explain encoding & decoding procedure for linear block code in detail.
- c) i) Show that in Binary Symmetric Channel, the channel capacity is given by,  $C = 1 + P \log P + (1-P) \log (1-P)$   
 ii) Design a single error correcting Hamming code for a message length of 4.

### SECTION -II

Q4) Attempt any Three of the following

[18]

- a) The generator polynomial for a (7,4) cyclic code is given by  $g(x) = 1+X^2+X^3$ . Determine the code vectors for the message vectors (0111), (1110) and (1110) using Nonsystematic and Systematic form method.
- b) Determine minimal polynomial of GF (8) whose trans field is GF(2) with Primitive Polynomial  $X^3+ X^2 + 1$ . Also determine generator polynomial for  $tc=1, 2$ .
- c) State the feature of RS code. Explain the decoding for RS Code.
- d) Explain the Structural & distance properties of Convolutional code.



Q5) Attempt any Two of the following

[16]

- a) A (15,5) BCH double error correcting code has the generator polynomial,  $g(x) = x^{10} + x^8 + x^5 + x^4 + X^2 + X + 1$ . Find the transmitted code word if the received code word is  $X^2 + X^4$ . Consider Primitive Polynomial is  $X^4 + X + 1$ .
- b) A Convolutional encoder using three shift registers with the code rate,  $r = 1/2$  has two generating Vectors as:  $g_1 = [1 \ 1 \ 1]$  and  $g_2 = [10 \ 1]$
- Sketch the encoder configuration
  - Determine generator matrix for convolutional code
  - If the message sequence is (1 1 1 1), determine the output sequence of the encoder using transform domain approach.
  - Draw Code tree and State diagram.
- c)
  - Explain the procedure for constructing extension field  $GF(2^4)$  using suitable Primitive polynomial.
  - What is cyclic redundancy Check Codes? Explain the procedure to obtain CRC.

Q6) Attempt any Two of the following

[16]

- a) Construct encoder and Syndrome calculator for the systematic (7,4) Cyclic code generated by,  $g(X) = X^3 + X^2 + 1$  and verify its operation using the message vector (0101). Also determine syndrome Vector for error pattern (0100000).
- b) Determine the generator polynomial for (7,5) RS code over  $GF(8)$ . If the message vector is {111, 101, 010, 110} & error vector polynomial  $e(x) = \alpha^2 X^3$ . Also find code vector, Code polynomial  $C(x)$  & received Polynomial  $r(x)$ . Also verify whether decoding of received polynomial results into transmitted code polynomial  $C(x)$ .
- c) Write a note on
- Primitive element
  - Code trellis



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**B.E. (Electronics) (Part - II) (Semester - VII) (Revised)**  
**Examination, April - 2018**  
**EMBEDDED SYSTEM DESIGN**  
**Sub. Code : 67527**

Day and Date : Wednesday, 25- 4 - 2018

Total Marks : 100

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

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

**SECTION - A**

**Q1) Solve any three**

- a) Classify following three cases in to three types of embedded systems and discuss method to design those system 1. Blood pressure monitoring system 2. Adaptive cruise control 3, ATM machine. [6]
- b) Discuss ARM 7 register set and usage of each. [6]
- c) Discuss method of switching from USER mode to SYSTEM mode.[6]
- d) Discuss important features of RS 485 protocol and compare it with RS422. [6]

**Q2) Solve any two**

- a) What will be outcome of execution of following instruction [8]
  - i) SUB R4,R5,R7,LSR R2
  - ii) STR R1,[R2],R4
  - iii) LDREQB R1,[R6,#5]
  - iv) LDMFD SP,!{R15}
  - v) MLAEQS R1,R2,R3,R4
  - vi) MSR CPSR\_FLG,#0×F0000000
  - vii) BLCC sub
  - viii) ADD R1, R2, #0×70, LSR#3
- b) Explain nested call operation in ARM with suitable example. [8]
- c) Demonstrate use of SWI instruction with suitable example. [8]

**P.T.O.**



Q3) Solve any two:

- Draw frame format of standard CAN bus protocol and discuss each field. [8]
- With suitable timing diagram discuss I2C bus arbitration process. [8]
- With suitable example explain use of PUSH and POP instruction using LR and PC in respective instructions when ARM is in thumb state. [8]

**SECTION - B**

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

- Explain the role of AHB-APB Bridge and APB divider in LPC 2148.
- Explain various functional blocks used by Memory Acceleration Module on LPC 2148.
- Explain, the operation of Brown Out Detect facility provided on LPC 2148
- Explain various types of resets used on LPC 2148.

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

- Explain how the power control is implemented on LPC 2148 with related registers.
- Explain the capture operation of timer, also explain role of capture registers and capture control register for timer in LPC 2148.
- Write a short note on A to D converters available on LPC 2148. Explain Burst mode operation.
- Explain the operation of Boot loader on LPC 2148.

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

- Explain different task scheduling algorithms.
- Explain working mechanism followed by Mutex.
- Explain role of mailboxes and message queues in inter task synchronization and communication.

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**B.E. (Electronics) (Part - IV) (Semester - VII) (Revised) (New)**

**Examination, April - 2018**

**COMPUTER NETWORK**

**Sub. Code : 67528**

**Day and Date : Thursday, 26 - 04 - 2018**

**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 necessary data wherever required.

**SECTION - I**

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

- a) Draw OSI model & explain in brief the functions at each layer.
- b) With a neat schematic explain GO-Back-N ARQ technique for the lost frame operation.
- c) With a suitable schematic explain Link State Routing protocol.

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

- a) What is traffic shaping? Explain Leaky bucket algorithm.
- 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's algorithm

**P.T.O.**

SECTION - II

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

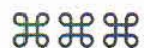
- a) Explain UDP datagram format.
- b) Explain the various TCP services.
- c) Explain the principle of congestion control in TCP.

**Q5. Attempt any two:** [18]

- a) Discuss how SMTP works? Can multimedia message be transmitted using SMTP?
- b) Note on 'Header format of HTTP'.
- c) Explain the different control connection and data connection in FTP.

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

- a) Explain the message integrity using MAC.
- b) Explain the substitution cipher with an example.
- c) Write short note on symmetric key cryptography.



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**B.E. (Electronics) (Semester - VII)**  
**(Revised) Examination, April -2018**  
**IMAGE PROCESSING**  
**Sub. Code : 67529**

Day and Date : Friday, 27 - 04 - 2018  
Time : 2.30 p.m to 5.30 p.m.

Total Marks : 100

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

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

- a) Describe sampling and quantization process for images.
- b) Explain spatial and intensity resolution of an image.
- c) Describe 8-adjacency and m-adjacency of pixel.
- d) What is Contrast stretching? Why used in image processing.
- e) Describe types of distance metric used in Image processing.

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

- a) Draw and explain fundamental steps in digital image processing.
- b) Write various application of image processing.
- c) Explain image sensors used for image acquisition.

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

- a) Explain Log and Gamma transformation.
- b) What is Histogram matching? Write how histogram matching is obtained.
- c) How image averaging & Image subtraction help for image enhancement.

*P.T.O.*



**Q4) Attempt any Four.**

- a) Explain mechanics of linear spatial filtering 3 by 3 filter mask.
- b) Explain smoothing linear filtering of an image.
- c) Explain Unsharp masking and Highboost filtering.
- d) Describe CMY color model with neat diagram.
- e) Explain concept of Gradient operator used in image enhancement.

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

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

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

- a) Describe RGB color model.
- b) Explain pseudo color image processing.
- c) How to convert colors from RGB to HSI Model and vice versa.



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**B.E. (Electronics) (Semester - VII) (Revised)**  
**Examination, April - 2018**  
**BIOMEDICAL INSTRUMENTATION - I (Elective-I)**  
**Sub. Code : 67532**

Day and Date : Saturday, 28 - 4 - 2018

Total Marks : 100

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

- With neat schematic diagram explain physiology of central nervous system.
- What are different selection factors for transducers used for biomedical application?
- Give the classification of electrodes used for sensing biosignal.
- Explain skin contact impedance measurement method with suitable diagram.

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

- Give the classification of biomedical equipment with suitable example.
- Explain following bioelectric signal with their typical characteristics.
  - Electromyogram (EMG)
  - Electro - oculogram (EOG)
- Draw diagrams illustrating the process of respiration and air circulation in respiratory system.

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

- With neat sketch explain electrodes used for ECG, EEG and EMG.
- What is the frequency range of biomedical signals? Explain the requirements of recorder used for these.
- What is meaning of evoked potential? Explain with suitable example.

**P.T.O.**

SECTION-II

**Q4)** Attempt any THREE from following: [18]

- a) Explain basic X-ray components.
- b) Explain needle electrodes used for EEG.
- c) What is meaning of electrode - electrolyte interface?
- d) Explain with block schematic the working of EMG machine.

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

- a) What are different transducers selection factors for biomedical applications.
- b) Explain direct and indirect blood pressure measurement methods. Define systolic and diastolic blood pressure.
- c) Explain with neat sketch the working of spirometer.

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

- a) List various methods of respiration rate measurements. Explain any one in detail.
- b) Explain different ways used for trouble shooting and maintenance of X-ray machine.
- c) Give comparison between macroshock and microshock. Also mention the preventive measures to reduce shock hazards.

