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**Question Paper Code : 57298**

**B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Sixth Semester**

**Electronics and Communication**

**EC 6602 – ANTENNA AND WAVE PROPAGATION**

**(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. Define radiation resistance.
2. The radial component of the radiated power density of an antenna is given by  $W_{rad} = a_r W_r = a_r A_o \sin \theta / r^2$  (W/m<sup>2</sup>), where  $A_o$  is the peak value of the power density,  $\theta$  is the usual spherical coordinate, and  $a_r$  is the radial unit vector. Determine the total radiated power.
3. Why antenna measurements are usually done in fraunhofer zone ?
4. The radiation resistance of an antenna is  $72 \Omega$  and the loss resistance is  $8 \Omega$ . What is the directivity (in dB), if the power gain is 15 ?
5. Define gain of an antenna. Bring out a relationship between gain and aperture of an antenna.
6. Draw the radiation pattern of an isotropic point sources of same amplitude and opposite phase that are  $\lambda/2$  apart along X-axis symmetric with respect to origin.

7. On what principle slot antenna works ? Explain the principle.
8. State Rumsey principle on frequency independence.
9. Find the range of LOS system when the receive and transmit antenna heights are 10m and 100 m respectively.
10. What are the specific features of troposcatter propagation ?

**PART - B (5 × 16 = 80 Marks)**

11. (a) Derive the expression for the field quantities radiated from a  $\lambda/2$  dipole and prove that the radiation resistance to be  $73 \Omega$ . (16)

**OR**

- (b) Derive the expression for the field quantities (E and H) for a small oscillation current element. (16)

12. (a) Discuss the geometry of a parabolic reflector and the significance of f/D ratio. Explain its feed configurations. (16)

**OR**

- (b) Discuss the construction and design of a yagi uda array. Show that the impedance of a folded dipole is  $300 \Omega$ . (16)

13. (a) Obtain the expression for the field and the radiation pattern produced by a N element array of infinitesimal with distance of Separation  $\lambda/2$  and currents of unequal magnitude and phase shift 180 degree. (16)

**OR**

- (b) (i) Using pattern multiplication determine the radiation pattern for 8 element array, separated by the distance  $\lambda/2$ . (8)

- (ii) Write short notes on tapered array and phased array. (8)

14. (a) (i) Explain the design procedure for the construction of log periodic antenna. (10)

(ii) Discuss the construction equation for the helical antenna. (6)

OR

(b) Explain the measurement procedure for the measurement of VSWR and radiation pattern. (16)

15. (a) (i) In the ionospheric propagation, consider that the reflection takes place at a height of 400 km and that the maximum density in the ionosphere corresponds to a refractive index of 10 MHz. Determine the ground range for which this frequency is the MUF. Take earth's curvature into consideration. (6)

(ii) Describe the structure of the atmosphere and explain each layer in detail. (10)

OR

(b) (i) Discuss the effects of earth's magnetic field on ionosphere radio wave propagation. (8)

(ii) Describe the troposphere and explain how ducts can be used for microwave propagation. (8)

Reg. No. 

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**Question Paper Code : 57241**

**B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Sixth Semester**

**Electronics and Communication Engineering**

**CS 6303 – COMPUTER ARCHITECTURE**

**(Common to Information Technology)**

**(And also common to Fifth Semester Elective – Electronics and Instrumentation  
Engineering, Instrumentation and Control Engineering, Fifth Semester – Robotics and  
Automation Engineering and Third Semester Computer Science and Engineering)**

**(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. How to represent Instruction in a Computer System ?
2. Distinguish between auto increment and auto decrement addressing mode.
3. Define ALU.
4. What is Subword Parallelism ?
5. What are the advantages of pipelining ?
6. What is Exception ?
7. State the need for Instruction Level parallelism.
8. What is Fine grained Multithreading ?
9. Define Memory hierarchy.
10. State the advantages of virtual memory.

**PART – B (5 × 16 = 80 Marks)**

11. (a) Discuss about the various components of a computer system. (16)

**OR**

- (b) Elaborate the different types of addressing modes with a suitable example. (16)

12. (a) Explain briefly about floating point addition and Subtraction algorithms. (16)

**OR**

- (b) Define Booth Multiplication algorithm with suitable example. (16)

13. (a) What is pipelining ? Discuss about pipelined data path and control. (16)

**OR**

- (b) Briefly explain about various categories of hazards with examples. (16)

14. (a) Explain in detail about Flynn's classification. (16)

**OR**

- (b) Write short notes on : (16)

(i) Hardware multithreading

(ii) Multicore processors.

15. (a) Define Cache Memory ? Explain the Various Mapping Techniques associated with cache memories. (16)

**OR**

- (b) Explain about DMA controller, with the help of a block diagram. (16)

Reg. No.

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**Question Paper Code : 57259**

**B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Sixth Semester**

**Electronics and Communication Engineering**

**CS 6551 – COMPUTER NETWORKS**

**(Common to Fourth Semester – Computer Science and Engineering/ Fifth Semester –  
Information Technology)**

**(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. Define flow control.
2. Write the parameters used to measure network performance.
3. Define hidden node problem.
4. What is Bluetooth ?
5. Expand ICMP and write the function.
6. Write the types of connecting devices in internetworking.
7. What do you mean by slow start in TCP congestion ?
8. List the different phases used in TCP connection.
9. Define URL.
10. Mention the different levels in domain name space.

**PART – B ( $5 \times 16 = 80$  Marks)**

11. (a) Explain any two error detection mechanism in detail. (16)

**OR**

- (b) Explain in detail about : (8)

- (i) HDLC (8)  
(ii) PPP (8)

12. (a) Give the comparison between different wireless technologies ? Enumerate 802.11 protocol stack in detail. (16)

**OR**

- (b) Write a short on : (8)

- (i) DHCP (8)  
(ii) ICMP (8)

13. (a) With a neat diagram explain Distance vector routing protocol. (16)

**OR**

- (b) Explain about IPV6 ? Compare IPV4 and IPV6. (16)

14. (a) Define UDP. Discuss the operations of UDP. Explain UDP checksum with one example. (16)

**OR**

- (b) Explain in detail the various TCP congestion control mechanisms. (16)

15. (a) (i) Describe how SMTP protocol is used in E-mail applications. (8)  
(ii) Explain HTTP with an example. (8)

**OR**

- (b) Explain in detail about Web service architecture. (16)

Reg. No.

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**Question Paper Code : 57270**

**B.E./B. Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Sixth Semester**

**Electronics and Communication Engineering**

**EC 6001 – MEDICAL ELECTRONICS**

**(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. List the important characteristics required for bioamplifier.
2. Mention the electrodes used to record biopotential from a single muscle fibre.
3. Define Cardiac output. Find the cardiac output of a person if his heart rate is 70 BPM and stroke volume is 70 ml.
4. State the different types of test performed using auto analyser.
5. Why are asynchronous pacemakers no longer used ?
6. When do you need heart lung machine ?
7. List the devices used to safeguard against electric hazards.
8. What is radio pill ? Mention the application of radio pill.
9. State the applications of telemedicine.
10. List the types of pumping sources used in LASER.

**PART – B (5 × 16 = 80 Marks)**

11. (a) (i) Explain the international standard 12 lead system used to record ECG. (10)  
(ii) List and discuss the characteristics and frequency bands of EEC signal. (6)

**OR**

- (b) (i) Discuss in detail about the origin of action potential and resting potential with necessary equations. (10)  
(ii) Describe the typical recording setup of EMG. (6)

12. (a) (i) Describe the measurement of pH of blood using pH meter. (8)  
(ii) Explain the measurement of respiration rate using impedance technique. (8)

**OR**

- (b) (i) State and explain the working principle of electromagnetic blood flow meter. (8)  
(ii) Briefly describe the working of coulter counter. (8)

13. (a) With a neat diagram explain the block diagram of arterial and ventricular triggered pacemaker. (16)

**OR**

- (b) Explain in detail the principle block diagram and working of haemodialyser. (16)

14. (a) (i) Explain the working and application techniques of shortwave diathermy. (10)  
(ii) Discuss the different operations performed using surgical diathermy. (6)

**OR**

- (b) (i) Describe the physiological effects of electricity on humans. (10)  
(ii) Write short notes on frequency selection for telemetry applications. (6)

15. (a) (i) What is thermography ? Explain the block diagram of infrared imaging system. (10)  
(ii) Describe the different operations performed using endoscopy. (6)

**OR**

- (b) (i) What is cryogenic ? List some cryogenics agents with its operating temperature and explain how it is used to perform surgery. (10)  
(ii) Write short notes on applications of LASER in medicine. (6)

Reg. No.

Question Paper Code : 57297

**B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

Sixth Semester

## MEDICAL ELECTRONICS

EC 6601 – VLSI DESIGN

(Common to Electronics and Communication Engineering)

(Regulations 2013)

## Time : Three Hours

### **Maximum : 100 Marks**

**Answer ALL questions.**

**PART - A ( $10 \times 2 = 20$  Marks)**

1. State channel-length modulation. Write down the equation for describing the channel length modulation effect in NMOS transistors.
  2. What is Latch-up ? How to prevent latch up ?
  3. Give Elmore delay expression for propagation delay of an inverter.
  4. Why single phase dynamic logic structure cannot be cascaded ? Justify.
  5. Draw the switch level schematic of multiplexer based nMOS latch using nMOS only pass transistors for multiplexers.
  6. What is clocked CMOS register ?
  7. What is meant by bit-sliced data path organization ?
  8. Determine propagation delay of n-bit carry select adder.
  9. What are feed-through cells ? State their uses.
  10. State the features of full custom design.

**PART – B (5 × 16 = 80 Marks)**

11. (a) (i) Describe the equation for source to drain current in the three regions of operation of a MOS transistor and draw the VI characteristics. (8)  
(ii) Explain in detail about the body effect and its effect in MOS device. (8)

**OR**

- (b) (i) Explain the DC transfer characteristics of a CMOS Inverter with necessary conditions for the different regions of operation. (8)  
(ii) Discuss the principles of constant field and lateral scaling. Write the effects of the above scaling methods on the device characteristics. (8)

12. (a) (i) Draw the static CMOS logic circuit for the following expression (8)  
(a)  $Y = \overline{(A \cdot B \cdot C \cdot D)}$   
(b)  $Y = \overline{D(A + BC)}$   
(ii) Discuss in detail the characteristics of CMOS transmission gate ? (8)

**OR**

- (b) What are the sources of power dissipation in CMOS and discuss various design techniques to reduce power dissipation in CMOS ? (16)

13. (a) Explain the operation of master-slave based edge triggered register. (16)

**OR**

- (b) Discuss in detail various pipelining approaches to optimize sequential circuits. (16)

14. (a) Design a 16 bit carry bypass and carry select adder and discuss their features. (8 + 8)

**OR**

- (b) Design a  $4 \times 4$  array multiplier and write down the equation for delay. (16)

15. (a) With neat sketch explain the CLB, IOB and programmable interconnects of an FPGA device. (16)

**OR**

- (b) Write brief notes on :

- (a) Full custom ASIC (8)

- (b) Semi custom ASIC (8)