

Code No: 135CX

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, December - 2019****PRINCIPLES OF ELECTRONIC COMMUNICATIONS****(Common to CE, EEE, CSE, EIE, IT)****Time: 3 Hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A****(25 Marks)**

- 1.a) Express  $P_{out}=12.3$  dBm in watts. [2]
- b) An amplifier has a gain of 45,000, which is too much for the application. With an input voltage of  $20 \mu V$ , what attenuation factor is needed to keep the output voltage from exceeding 100 mV? Let  $A_1$ = amplifier gain = 45,000;  $A_2$  = attenuation factor;  $A_T$  = total gain. [3]
- c) Define ASK and PSK. [2]
- d) Write AM equation. Define modulation index, and percentage modulation. [3]
- e) Describe the modulation and data rate used in caller ID. [2]
- f) What is the main purpose of a LAN? What is the upper limit on the number of users on a LAN? [3]
- g) State the effects on a satellite signal if the angle of elevation is too low. [2]
- h) Define what is meant by bandwidth as it applies to fiber-optic cable. What units are used to express bandwidth? [3]
- i) List the operating frequency ranges of ZigBee and the maximum data rates for each. [2]
- j) Define personal-area network (PAN) and wireless local area network (WLAN). [3]

**PART – B****(50 Marks)**

- 2.a) A power amplifier with a 40-dB gain has an output power of 100 W. What is the input power? [5+5]
  - b) Explain the concept of frequency translation with suitable example. [5+5]
- OR**
3. Draw and describe the various frequency ranges in the electromagnetic spectrum with its applications [10]
- 4.a) Find the percentage of power saved in SSB when compared with AM system. [5+5]
  - b) What is PCM? Illustrate the PCM transmitter and receiver with a diagram. [5+5]
- OR**
- 5.a) Discuss about the spectra of PWM and PPM signals [5+5]
  - b) Compare the characteristics of AM with FM. [5+5]

- 6.a) Explain about paging systems.  
b) Describe how repeaters, hubs, bridges, routers and gateways are used in LANs. [5+5]

**OR**

- 7.a) State the general operation of a cordless telephone.  
b) Explain the working of Token ring with neat diagram. [5+5]

- 8.a) Explain the block diagram of optical fiber communication system with transmitter and receiver.  
b) State the operative physical principles of launching a satellite and maintaining its orbit. [5+5]

**OR**

- 9.a) Explain the operation of LED. Also explain different types of LED's and its different structures.  
b) Describe the concept and operation of the Global Positioning System. [5+5]

- 10.a) Discuss about 3G standards – WCDMA/UMTS for wireless network  
b) What is RFID? What is the most recent version of RFID standards? State the Operating frequency range, advantages and benefits. [5+5]

**OR**

- 11.a) Identify the features, benefits, applications, and operation of ultra wide band (UWB).  
b) Describe the access mode and modulation type used in the original version of Bluetooth. [5+5]

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