



Register Number:.....

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Fifth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

ECE260: Communication Engineering

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (10 x 1 =10 Marks)

1. An AM wave displayed on an oscilloscope has values of $V_{max} = 3.8$ and $V_{min} = 1.5$. The percentage of modulation is
 - a) 33.3
 - b) 30
 - c) 40
 - d) 43.3
2. If $f_{d\ max}$ and $f_{m\ max}$ represents maximum frequency deviation and maximum modulating frequency respectively of an FM signal, then bandwidth of an FM signal based on carson's rule is
 - a) $2 (f_{d\ max} + f_{m\ max})$
 - b) $f_{d\ max} + f_{m\ max}$
 - c) $2 (f_{d\ max} - f_{m\ max})$
 - d) $(f_{d\ max} + f_{m\ max}) / 2$
3. The characteristic impedance of a parallel two-wire transmission line is
 - a) $176 \log (D/2S)$
 - b) $\log (D/2S)$
 - c) $\log (2S/D)$
 - d) $276 \log (2S/D)$
4. The standing wave ratio in terms of reflection coefficient K is stated as
 - a) $\frac{1+2K}{1-2K}$
 - b) $\frac{1+K}{1-K}$
 - c) $\frac{1-K}{1+K}$
 - d) $\frac{1-2K}{1+2K}$
5. The number of bits encoded into one signaling element is denoted as N and the bit rate

is denoted as f_b , then the baud rate is

- a) $N \cdot f_b$ b) f_b / N c) $f_b + N$ d) $f_b - N$

6. The bit error probability of an M-phase PSK system is

- a) $\text{erf}(z)$ b) $\log_2 M$ c) $\frac{\text{erf}(z)}{\log_2 M}$ d) $\frac{\log_2 M}{\text{erf}(z)}$

7. The modulation technique used for high speed synchronous voice band modem is

- a) QAM b) ASK c) FSK d) PSK

8. The data rate supported by ISDN-PRI consisting of (30B+D) channel configuration is

- a) 1.544 Mbps b) 1 Mbps c) 2.048 Mbps d) 2 Mbps

9. If α and β denote the semimajor axis and semiminor axis, then the eccentricity of the ellipse based on kepler's first law is defined as

- a) $(\alpha^2 - \beta^2)^{1/2}$ b) $(\alpha^2 + \beta^2)^{1/2}$ c) $\frac{(\alpha^2 + \beta^2)^{1/2}}{\alpha}$ d) $\frac{(\alpha^2 - \beta^2)^{1/2}}{\alpha} 10.$

What is the optical power in dBm for the power levels of $20 \mu\text{W}$?

- a) 10 dBm b) -10 dBm c) -17 dBm d) 17 dBm

PART B (10 x 2 =20 Marks)

11. List the applications of Amplitude Modulation.

12. What is capture effect in Frequency Modulation?

13. State the condition for a properly terminated transmission line.

14. Define SWR and express the reflection coefficient in terms of load and characteristic impedances.

15. What is Pulse code modulation?

16. Draw the phasor diagram and constellation diagram of BPSK modulator.

17. Mention the electrical specifications of RS-232 serial interface standard.

18. How does a modem facilitate the digital data transmission between DTEs over a POTS telephone circuit.
19. State Kepler's second law.
20. Mention the three essential types of optical fibers that are commonly used.

PART C (5 x14 =70 Marks)

21. (a) (i) Explain the principles of AM generation, frequency spectrum and bandwidth (7)
(ii) Describe the principles of Envelope Detector with its block diagram. (7)
- (OR)**
- (b) (i) Discuss the operations of super heterodyne receiver with its block diagram. (7)
(ii) Illustrate the merits of FM over AM. (7)
22. (a) Explain the features of a two-wire transmission line with its equivalent circuit.
Derive the characteristic impedance of the transmission line.
- (OR)**
- (b) (i) Illustrate the concept of standing waves for an open-circuited and a short-circuited transmission line. (7)
(ii) Describe radio signal propagation by means of space waves. (7)
23. (a) With the block diagram of T1 Digital Carrier System, explain the significance of Time Division Multiplexing and the TDM frame format.
- (OR)**
- (b) Explain in detail the principles of BFSK with its modulator and demodulator circuit diagrams.
24. (a) (i) Explain the VRC and CRC error detection techniques. (7)

(ii) Discuss the retransmission and forward error correction methods in data communication. (7)

(OR)

(b) (i) Describe the ISDN architecture necessary diagram. (7)

(ii) Explain the features of star, bus and ring topologies in LAN. (7)

25. (a) (i) State the advantages and disadvantages of Geosynchronous satellites. (7)

(ii) Explain the uplink and downlink satellite system link models. (7)

(OR)

(b) (i) Discuss the advantages of using optical fiber cables over conventional metallic transmission media. (7)

(ii) Illustrate the predominant losses that occur in optical fiber cables. (7)
