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**Question Paper Code : 21460**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Fifth Semester

Electronics and Instrumentation Engineering

EC 2315/EI 55/10133 EE 501 — COMMUNICATION ENGINEERING

(Regulations 2008/2010)

(Common to PTEC 2315 — Communication Engineering for B.E. (Part – Time)  
Fourth Semester — Electronics and Instrumentation Engineering – Regulations 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define maximum usable frequency.
2. Define standing waves.
3. What are the advantages of super heterodyne receiver?
4. In an FM system. if  $m_f$  is doubled by halving the modulation frequency. what will be the effect on the maximum deviation?
5. Give the expression for probability of error of BPSK and BFSK.
6. For a 16-PSK system operating with an information bit rate of 48kbps, determine the bandwidth efficiency.
7. What is the need for error control in data communication?
8. What is the purpose of a data modem?
9. List the advantages of optical fiber.
10. What is station keeping?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain with the necessary waveforms the time and frequency domain representation of signals. (8)
- (ii) A generator of 1V, 1kHz supplies power to a 100 km long line terminated in  $Z_0$  and having the following constants  $R=10.4\Omega/km, L=0.00367H/km, G=0.8\times 10^{-6}$  mho/km.  $C=0.00835\times 10^{-6}F/km$ . Calculate  $Z_0, \alpha, \beta, \lambda$  and  $v$ . (8)

Or

- (b) (i) Derive the general expression of voltage and current at any point of transmission line. (10)
- (ii) Write a note on space wave propagation. (6)
12. (a) (i) Derive the expression for the rms value of the wave, from the instantaneous voltage of AM wave. (8)
- (ii) Derive the relation between the output power of an AM transmitter and the depth of modulation, and plot it as a graph for values of the modulation index from zero to maximum. (8)

Or

- (b) (i) Explain the frequency division multiplexing and time division multiplexing in detail. (10)
- (ii) List the advantages and disadvantages of FM. (6)
13. (a) (i) With a neat block diagram, waveforms and expression, explain the operation of QPSK. Also derive its bit error rate. (10)
- (ii) List the advantages of digital modulation over analog modulation. (6)

Or

- (b) (i) Explain the pulse code modulation in detail with necessary diagrams. (8)
- (ii) Explain ASK and FSK in detail. (8)

14. (a) Explain in detail the ISO-OSI seven layer architecture for WAN. (16)

Or

- (b) (i) List the objectives of LAN and ISDN. (3+3)  
(ii) Narrate elaborately ISDN channels and interfaces along with ISDN architecture with necessary diagrams. (10)

15. (a) (i) Describe the satellite orbital pattern and elevation categories in detail. (8)  
(ii) Explain the cell splitting and sectoring in detail. (8)

Or

- (b) (i) Explain how light waves propagate through a optic fiber cable. (7)  
(ii) With a neat block diagram explain the operation of a monochrome television. (9)