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**Question Paper Code: 53806**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Information Technology

15UIT306-ANALOG AND DIGITAL COMMUNICATION

(Regulation 2015)

Duration: 1.15 hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

1. FM signal is better than AM signal because\_\_\_\_\_ CO1- R
  - (a) Less immune to noise
  - (b) Less adjacent channel interference
  - (c) Amplitude limiters are used to avoid amplitude variations
  - (d) All of the above
2. The amount frequency deviation in FM signal CO1- R
  - (a) Carrier frequency
  - (b) Modulating Frequency
  - (c) Intermediate Frequency
  - (d) Amplitude of the modulating signal
3. QPSK system uses a phase shift of\_\_\_\_\_ CO2- R
  - (a)  $\pi$
  - (b)  $\frac{\pi}{2}$
  - (c)  $\frac{\pi}{4}$
  - (d)  $2\pi$
4. In BPSK, the phase difference of output signal and analog carrier when the binary input 0 is applied \_\_\_\_\_. CO2- R
  - (a)  $0^0$
  - (b)  $90^0$
  - (c)  $180^0$
  - (d)  $-90^0$
5. T1 carrier system is used\_\_\_\_\_ CO3- R
  - (a) For PCM voice transmission
  - (b) For delta modulation
  - (c) For frequency modulated signals
  - (d) None of the above

6. The digital Modulation technique in which the step size is not fixed is \_\_\_\_\_ CO3-R  
 (a) Delta Modulation (b) Adaptive Delta modulation (c) PCM (d) DPCM
7. The wide band usage in CDMA helps in\_\_\_\_\_ CO4- R  
 (a) Increased immunity to interference  
 (b) Increased immunity to jamming  
 (c) Different spectrum allocation in different time slots  
 (d) Multiple user access
8. Frequency hopping involves a periodic change of transmission \_\_\_\_ CO4-R  
 (a) Signal (b) Frequency (c) Phase (d) Amplitude
9. For a (7, 4) block code, 7 is the total number of bits and 4 is the number of\_\_\_\_\_ CO5- R  
 (a) Information bits (b) Redundant bits  
 (c) Total bits- information bits (d) None of the above
10. The main purpose coding is \_\_\_\_\_ CO5-R  
 (a) To improve bit error rate (b) To Improve SNR  
 (c) To improve selectivity (d) To improve the Linearity.

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following questions)**

11. Derive the expression for instantaneous voltage of AM wave. Draw the AM wave and explain the power distribution. CO1- Ana (8)
12. Draw the block diagram of QPSK modulator, demodulator and explain its operation with signal space diagram and suitable QPSK waveforms. CO2- U (8)
13. Explain pulse code modulation with neat block diagram. CO3- U (8)
14. Explain with neat block diagram DS spread spectrum with coherent BPSK and derive its probability of error with jamming. CO4- U (8)
15. Construct a rate  $\frac{1}{2}$  convolutional encoder with constraint length 3 and generator sequences  $g^{(1)} = (1\ 0\ 1)$ ,  $g^{(2)} = (1\ 1\ 0)$  for the input [1 0 0 1 1] and identify the output using trellis diagram, state diagram and state table. CO5- U (8)