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Question Paper Code: 41836

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Information Technology

14UIT306 - ANALOG AND DIGITAL COMMUNICATIONS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A 100MHz carrier is frequency modulated by 10 KHz wave. For a frequency deviation of 50 KHz, calculate the modulation index of the FM signal
 - (a) 100
 - (b) 50
 - (c) 70
 - (d) 90
2. FM signal is better than AM signal because
 - (a) Less immune to noise
 - (b) Less adjacent channel interference
 - (c) Amplitude limiters are used to avoid amplitude variations
 - (d) All the above
3. According to Shannon Hartley theorem
 - (a) The channel capacity becomes infinite with infinite bandwidth
 - (b) The channel capacity does not become infinite with infinite bandwidth
 - (c) Has a tradeoff between bandwidth and Signal to noise ratio
 - (d) Both b and c are correct
4. The technique that may be used to increase average information per bit is
 - (a) Shannon-Fano algorithm
 - (b) ASK
 - (c) FSK
 - (d) Digital modulation techniques

5. Equalization in digital communication
 - (a) Reduces inter symbol interference
 - (b) Removes distortion caused due to channel
 - (c) Is done using linear filters
 - (d) All the above

6. Analog to digital conversion includes

(a) Sampling	(b) Quantization
(c) Both (a) and (b)	(d) None of these

7. Run Length Encoding is used for

(a) Reducing the repeated string of characters	(b) Bit error correction
(c) Correction of error in multiple bits	(d) All the above

8. Eye pattern is

(a) Is used to study ISI	(b) May be seen on CRO
(c) Resembles the shape of human eye	(d) All the above

9. In DPSK technique, the technique used to encode bits is

(a) AMI	(b) Differential code
(c) Uni-polar RZ format	(d) Manchester format

10. The spectrum of the sampled signal may be obtained without overlapping only if

(a) $f_s \geq 2f_m$	(b) $f_s < 2f_m$	(c) $f_s > f_m$	(d) $f_s < f_m$
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PART - B (5 x 2 = 10 Marks)

11. Define bandwidth efficiency.
12. Define Shannon limit for information capacity.
13. Define noise and fading.
14. What is the need for error control coding?
15. What is pseudo-noise?

PART - C (5 x 16 = 80 Marks)

16. (a) Derive expression for an AM wave and draw its spectrum. (16)

Or

- (b) (i) Write a note on frequency spectrum analysis of angle modulated waves. (8)
(ii) Compare FM and PM. (8)
17. (a) With block diagram explain M-array PSK receiver. Compare M-array modulation schemes. (16)
- Or
- (b) What is carrier recovery? Discuss how carrier recovery is achieved by the squaring loop and Costas loop circuits. (16)
18. (a) Write short notes on: (i) Noise and fading (ii) Non-linear sequences. (16)
- Or
- (b) With neat diagram explain analog and digital communication system models. (16)
19. (a) What is companding? Explain analog companding process with the help of block diagram. (16)
- Or
- (b) Explain the concepts in delta modulation transmitter and receiver. (16)
20. (a) Explain direct sequence spread spectrum with coherent binary PSK. (16)
- Or
- (b) (i) Describe the application of CDMA in wireless communication system. (8)
(ii) Explain the basic principle of TDMA. (8)
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