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**Reg. No. :**

**Question Paper Code: 44045**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fourth Semester

Electronics and Communication Engineering

14UEC405 - ANALOG COMMUNICATION

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A 400 *W* carrier is amplitude modulated with *m* = 0.75. The total power in AM is

(a) 400 *W* (b) 512 *W* (c) 588 *W*  (d) 650 *W*

2. The highest modulation frequency typically used in AM broadcast is

(a) 5*kHz* (b) 10*kHz*  (c) 15*kHz* (d) 25*kHz*

3. The modulator stage in a radio transmitter is normally

(a) Class A (b) Class B (c) Class AB (d) Class C

4. In commercial FM broadcasting, the audio frequency range handled is only up to

(a) 5 *kHz* (b) 15 *kHz* (c) 3.5 *kHz*  (d) 10.7 *kHz*

5. Ergodic process is always a stationary random process.It is possible to have a stationary random process that is not ergodic

(a) True, True (b) False, True (c) True , False (d) False, False

6. Random process is a function of

(a) Random event and time (b) Random event and frequency (c) Random event and real number (d) None of these

7. If transmission bandwidth is doubled in FM, SNR is

(a) Doubled (b) Raised four times (c) Decreased four times (d) Halved

8. The ideal value of noise figure is

(a) 1 dB (b) 0 dB (c) Infinite (d) 100 dB

9. A band-limited low pass signal is sampled at twice its Nyquist rate with *fs*= 2000 sps. The signal is band limited to

(a) 250 *Hz* (b) 1000 *Hz*  (c) 500 *Hz*  (d) 2000 *Hz*

10. Indicate which of the following system is digital

(a) PPM (b) PWM (c) PDM (d) PCM

PART - B (5 x 2 = 10 Marks)

11. The carrier amplitude after modulation varies between 4*V* and 1*V*. Calculate the modulation depth.

12. Compare WBFM and NBFM.

13. State the properties of the PDF of a random variable.

14. What is pre-emphasis and de-emphasis?

15. Define Nyquist sampling theorem.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Draw the VSB spectrum and explain the significance. (8)

(ii) How do you demodulate AM signal? Explain. (8)

Or

(b) Discus the coherent detection of DSB-SC modulated wave with a block diagram of detector and Explain. (16)

17. (a) Derive the expression for the frequency modulated signal. Explain what is meant by

narrowband FM and wideband FM using the expression. (16)

Or

(b) (i) Derive an expression for single tone narrow band and wide band FM. (8)

(ii) Draw the circuit diagram of varactor modulator and explain its working. (8)

18. (a) Define and explain about auto correlation and cross correlation and its properties. (16)

Or

(b) (i) Explain the following terms: mean, correlation, covariance and ergodicity. (8)

(ii) List the properties of the auto correlation function. (8)

19. (a) Explain the working of super heterodyne receiver with its parameters. (16)

Or

(b) (i) Write notes on shot noise and thermal noise. (8)

(ii) Derive the relationship between noise figure and equivalent noise temperature. (8)

20. (a) Explain the Generation and Demodulation procedure for PAM signal. (16)

Or

(b) Give short notes about time division multiplexing. (16)