Reg. No. : | | | | | | | | | | |

Question Paper Code: 41445

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

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. The highest modulation frequency typically used in AM broadcast is

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

2. Threshold effect is exhibited in the modulation of

   (a) AM (b) DSBSC (c) SSB (d) PPM

3. From bandwidth point of view, narrowband FM is equivalent to

   (a) AM (b) PM (c) SSB (d) DSB SC

4. FM broadcast band lies in

   (a) VHF band (b) UHF band (c) SHF band (d) HF band

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. The auto correlation of a constant is

(a) Constant (b) Zero
(c) Infinite (d) an impulse function

7. The ideal value of noise figure is

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

8. Pre-emphasis circuit is used

(a) After modulation (b) Before modulation
(c) Before detection (d) After detection

9. Indicate which of the following system is digital

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

10. Time division multiplexing is used in

(a) Analog circuits (b) Digital circuits
(c) Modulation circuit (d) Multiplier circuits

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. The carrier frequency of a broadcast signal is 100 *MHz*; maximum frequency deviation is 75 *KHz*. If the highest audio frequency modulated by the carrier is 15 *KHz*. What is the bandwidth of the signal?

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

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

15. What is analog pulse modulation?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Explain the low-level and high-level modulation methods with help of figures. (8)

(ii) With help of diagram explain ring modulator method to generate DSB-SC AM signal. (8)

Or

(b) Explain the phase and frequency discrimination method for SSB generation with suitable diagram. (16)

17. (a) (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)

Or

(b) The modulating signal in an FM wave is 500 *Hz* with amplitude 3.2 *volt* and frequency deviation is 6.4 *KHz*. If the audio frequency voltage is now increased to 8.4 *volt*, determine the new frequency deviation and modulation index. If the audio frequency voltage is increased to 20 *volt* while the audio frequency is dropped to 200 *Hz*, find the frequency deviation and modulation index. (16)

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

Or

(b) Define Gaussian process. Explain about gaussian process and its properties. (16)

19. (a) Explain about shot noise, thermal noise and white noise process with suitable diagram. (16)

Or

(b) Explain clearly the physical process that lead to the occurrence of threshold in FM receiver and also compare the noise performance in AM and FM system. (16)

20. (a) Explain about pulse amplitude modulation. (16)

Or

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

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