

(30)

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**SARDAR PATEL UNIVERSITY**  
**S.Y.B.Sc. (Semester III) EXAMINATION DEC.-2013**  
**Tuesday, 3<sup>rd</sup> December 2013**  
**2:30 PM to 5:30 PM**  
**US03CELC02**  
**ANALOG COMMUNICATION**

Total Marks: 70

Note: Figure to the right indicates full marks.

Q-1

**Multiple Choice Question****[10]**

- 1) The highest modulating frequency typically used in AM broadcast is \_\_\_\_\_.  
 (A) 5 KHz (B) 15 KHz  
 (C) 10 KHz (D) 1 MHz
- 2) Broadcast television service in India operates in \_\_\_\_\_ band of frequencies.  
 (A) VHF and UHF (B) Medium waves  
 (C) Micro waves (D) All of above
- 3) Which component of carrier signal varies in PM process?  
 (A) Amplitude (B) frequency  
 (C) Phase (D) None
- 4) The capacitive reactance is function of \_\_\_\_\_.  
 (A) Area of plates (B) Distance between plates  
 (C) Dielectric constant (D) All of above
- 5) Square law diode modulator circuit utilizes the \_\_\_\_\_ portion of the characteristics curve.  
 (A) Linear (B) Non - linear  
 (C) Inverse (D) None of above
- 6) The function of the RC circuit in the FET modulator is to select \_\_\_\_\_.  
 (A) Reactance (B) Gain  
 (C) Resistance (D) None of above
- 7) Varactor diode operates in \_\_\_\_\_ bias condition.  
 (A) Forward (B) Reverse  
 (C) Both (A) and (B) (D) Zero
- 8) The arrangement consisting two electric poles is known as \_\_\_\_\_.  
 (A) Monopole (B) Dipole  
 (C) Array (D) None of above
- 9) Which type of wave propagation will take place when the transmitting and receiving antenna are closed to the surface of earth?  
 (A) Ionospheric (B) Space  
 (C) Surface (D) Sky
- 10) The radiation pattern of the thin linear antenna in plane normal to it is \_\_\_\_\_.  
 (A) '8' figure (B) Circular  
 (C) Spherical (D) elliptical

P.T.O

**Q-2 Attempt Any Ten out of following. [20]**

- 1) What are the basic constituents of modern communication system?
- 2) Differentiate between AM and FM.
- 3) What is the need for modulation in a communication system?
- 4) Draw the neat and clean circuit diagram of square law diode detector.
- 5) Why collector modulation is superior to base modulation?
- 6) What is ground wave? Explain.
- 7) Enlist different methods of demodulation of FM signal
- 8) What is the difference between rectifier diode and Varactor Diode?
- 9) Define Frequency Modulation and draw the waveform of frequency modulated voltage.
- 10) Briefly explain the propagation of EM waves.
- 11) Which factors affect to the magnitudes of the space wave and the surface wave?
- 12) Give an account of radiation resistance?

- Q-3 (A) Draw and explain the block diagram of general communication system. [06]**  
**(B) Give an account of classification of Radio Frequency Spectrum. [04]**

**OR**

- Q-3 Discuss in detail amplitude modulation with waveform and derive the expression of amplitude modulated voltage with necessary figure. [10]**

- Q-4 (A) Explain the principle of collector modulation with necessary circuit diagram and waveform. [05]**  
**(B) Draw the circuit of a linear diode detector using a simple capacitor filter and describe graphically the detection process perform by the circuit. [05]**

**OR**

- Q-4 Draw the circuit of square law diode modulator and explain its working with necessary circuit diagram and waveform. [10]**

- Q-5 Draw the circuit of frequency modulator using varactor diode and explain its working [10]**

**OR**

- Q-5 Draw the circuit of the frequency modulator using reactance FET and explain its working with necessary diagrams. [10]**

- Q-6 Write a note on thin linear antenna and derive an expression for effective radiation resistance of thin linear antenna. [10]**

**OR**

- Q-6 (A) Discuss the surface wave propagation of electromagnetic waves for short distance and long distance. [05]**  
**(B) Give an account of ground wave propagation. [05]**

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