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**S.E. (E&TC) (II Sem.) EXAMINATION, 2016**

**ANALOG COMMUNICATION**

**(2012 PATTERN)**

**Time : Two Hours**

**Maximum Marks : 50**

**N.B. :—** (i) Attempt Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4,  
Q. No. 5 or Q. No. 6, Q. No. 7 or Q. No. 8.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Figures to the right indicate full marks.

(iv) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

(v) Assume suitable data, if necessary.

1. (a) State and compare different SSB generation methods. [6]

(b) An angle modulated signal is described by the equation :

$$\psi_{EM}(t) = 10 \cos (2\pi f_c t + 4 \sin 2\pi f_m t)$$

where  $f_c = 10$  MHz and  $f_m = 1000$  Hz.

(i) Determine the Modulation Index. Estimate the transmitted signal bandwidth.

(ii) Repeat (i)  $f_m$  is doubled. [6]

P.T.O.

*Or*

2. (a) With the help of spectrum and block diagram explain VSB modulation. What is its application ? [6]
- (b) Derive an expression for frequency and phase modulated wave. Sketch their waveforms for a sinusoidal input. [6]
3. (a) Explain distortions present in simple diode detector. [6]
- (b) State various sources of noise with examples. Explain the following types of noise in detail (any *two*) : [6]
- (i) Thermal noise
- (ii) Low frequency noise
- (iii) Shot noise.

*Or*

4. (a) Explain performance characteristics of radio receiver with suitable graphs. [6]
- (b) Consider a receiving system consisting of an RF amplifier with a noise figure of  $F_1 = 2$  dB and a gain of 9 dB followed by a mixer with a noise figure of  $F_2 = 9$  dB and a conversion gain of 15 dB. Calculate overall noise figure and noise temperature. [6]
5. (a) Describe threshold in angle modulation. [7]
- (b) Explain the performance of DSBSC in presence of noise. [6]

*Or*

- 6.** (a) Explain the performance of AM in presence of noise. [7]  
(b) Explain pre-emphasis and de-emphasis in FM. [6]
- 7.** (a) Explain aliasing and different ways to avoid aliasing. [7]  
(b) With the help of block diagram explain transmitter and receiver for Pulse code modulation. [6]

*Or*

- 8.** (a) Explain types of sampling with waveform. Which type is used for practical application ? [7]  
(b) With the help of neat diagram explain PWM. [6]