

h. Indicate which of the following systems is digital?

- (A) Pulse-position modulation (B) Pulse-code modulation.
 (C) Pulse-width modulation. (D) Pulse-frequency modulation.

i. In commercial T.V. transmission in India, picture and speech signal are _____ modulated respectively as:

- (A) VSB and VSB. (B) VSB and SSB.
 (C) VSB and FM. (D) FM and VSB.

j. Thermal noise power is proportional to _____.

- (A) \sqrt{B} (B) \sqrt{T}
 (C) \sqrt{BT} (D) BT

**Answer any FIVE Questions out of EIGHT Questions.
 Each question carries 16 marks.**

- Q.2** a. What is noise? Explain various sources of noise. (8)
- b. What is bandwidth of information signals? Explain the relationship between bandwidth and channel capacity. (8)
- Q.3** a. What is amplitude modulation? Derive an expression for amplitude modulated wave. (8)
- b. A transmitter with 20 kW carrier transmits 22.4 kW when modulated with a single sine wave. Calculate the modulation index, if the carrier is simultaneously modulated with another sine wave at 50% modulation. Find the total transmitted power. (8)
- Q.4** a. Explain following terms: (8)
- $\frac{S}{N}$
- (i) Ratio.
 (ii) Noise figure.
- b. State advantages and disadvantages of SSB transmission over DSB transmission. (8)
- Q.5** a. Estimate the Bandwidth and Power of an FM signal given by $e_{FM}(t) = 10 \cos(2\pi \times 10^6 t + 0.1 \sin 2\pi \times 10^3 t)$ (8)
- b. Compare PAM, PWM and PPM. (8)
- Q.6** a. Draw the block diagram of PLL and briefly explain its working. (8)
- b. What are different modes of radio wave propagation? Describe ground wave propagation briefly. (8)
- Q.7** a. Describe briefly different sources of losses in optical fibres. (8)
- b. Describe following terms for antenna: (8)

- (i) Polarisation.
- (ii) Bandwidth.
- (iii) Antenna Gain.

- Q.8** a. State the advantages and disadvantages of satellite communication. **(8)**
- b. Explain the working of a balanced slope detector using suitable diagram. **(8)**
- Q.9** a. Describe briefly the use of blanking and synchronizing pulses in T.V. signals. **(8)**
- b. What is sampling theorem for low pass signal? Explain it briefly **(8)**