S.E. (Com) Sem IV (R) 26/05/09

Con. 3296–09. **(REVISED COURSE)** **VR–3786**

216 (3 Hours) **[Total Marks : 100**

Analog & Digital Communication 3 p.m. to 6 p.m

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** out of remaining **six** questions.
(3) Assume any **suitable** data wherever **required** but justify the **same**.
(4) Answer to questions should be **grouped** and written **together**.

1. (a) For a 16-ary PCM system if **10**

$P_1 = P_2 = P_3 = P_4 = 0{\cdot}1$
$P_5 = P_6 = P_7 = P_8 = 0{\cdot}05$
$P_9 = P_{10} = P_{11} = P_{12} = 0{\cdot}075$
$P_{13} = P_{14} = P_{15} = P_{16} = 0{\cdot}025$

Calculate the entropy and information rate assume $f_m = 3$ KHz.

(b) Define code word, code rate and hamming weight. Also write short note on Hamming Code. **10**

2. (a) Explain block diagram of M-ary PSK and find the Eculidean distance for 8-ary PSK. **10**
(b) Compare ASK, PSK and FSK systems. **10**

3. (a) Explain match filter and optimum receiver. **10**
(b) Explain delta modulation and adaptive delta modulation and compare them. **10**

4. (a) Explain the following terms :— **10**
(i) Information and information rate
(ii) Entropy
(iii) Shannons theorem and
(iv) Channel Capacity.
(b) Define and explain various multiplexing techniques used in communication systems. **10**

5. (a) Explain with block diagram PM modulation and demodulation technique. **10**
(b) Draw and explain superheterodyne receiver for amplitude modulation. What are the various characteristics of the receiver ? **10**

6. (a) Explain (i) Noise triangle **10**
(ii) Pre emphasis
(iii) De emphasis in FM system.
(b) Explain the concept of image frequency and double spotting. **10**

7. Write short notes on :— **20**
(a) Various noise parameters
(b) Mouse in communication system
(c) Intersymbol interference
(d) QAM.