Mid-West University

Examinations Management Office

Semester End Examinations 2081

Bachelor level/ B.E. Computer/ 5th Semester — Full Marks: 50

Time: 3 hours — Pass Marks: 25

Subject: Data Communication (EX451/EX505)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

1. Describe transmission impairments of data communication system with suitable example. **[4]**

2. Explain Deterministic and Random signals with example. Determine whether the following signals are periodic or not? a) $x(t) = \sin 15\pi t$ and b) $x(t) = \sin \pi t\, u(t)$ **[2+2]**

3. Find the output of LTI system having impulse response $h(t) = e^{-2t}$; $t>0$ to the input and $x(t) = 0$ for $t < 0$, 1 for $0 \leq t \leq 1$ and 0 for $1 < t$. **[2+4]**

4. Discuss the parameters that are used to describe the performance of a data communication system. **[4]**

5. a) Why is line coding required, explain. **[2]**

b) A modulating signal $m(t) = 10\sin 1000\pi t$ is amplitude modulated with a carrier signal $c(t) = 50\sin 2\pi \times 10^5 t$. Find the modulation index, the carrier power, and the power required for transmitting AM wave if load = 60Ω. **[4]**

c) Explain PAM in detail. **[4]**

d) Design waveform for the following data sequence: 110110001100111 **[6]**

i) NRZ-L ii) NRZ-I iii) AMI iv) Manchester

6. With necessary diagram, briefly explain T1 Hierarchy. **[5]**

7. What is data switching? Differentiate between Datagram switching and Viral Circuit switching. **[4]**

8. a) How does Linear Block Codes help in error detection, explain in detail. **[5]**

b) What are Convolution Codes? Write the properties of Hamming codes. **[2]**

The End