CC-286

M. Sc. EXAMINATION, May 2018

(Third Semester)

(Re-appear Only)

PHYSICS

PHY611B

Digital Communication

Time : 3 *Hours*]   [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Derive and expression for power spectral density. **6**

(b) Explain Fourier representation of periodic and non-periodic signals with example. **14**

2. Explain noise in communication system with signal to noise ratio and noise figure. **20**

Unit II

3. (a) Discuss Shannon's encoding algorithm for continuous communication channel. **10**

(b) Define entropy and rate of information. An event has six possible outcomes with probability $P_1 = 1/2$, $P_2 = 1/4$, $P_3 = 1/8$, $P_4 = 1/16$, $P_5 = 1/32$ and $P_6 = 1/32$. Find the entropy of system and rate of information. (Here $r = 16$). **10**

4. (a) Define communication channels in discrete communication systems. **10**

(b) Explain the procedure for linear block cyclic codes. **10**

Unit III

5. (a) What is base band PAM system ? **4**

(b) Explain PSK and differential PSK signalling schemes. Compare these. **16**

6. Discuss in detail about the block diagram and pin diagram of USART 8251. **20**

Unit IV

7. Define basic optical communication system ? What are steps and graded index fibres and how wave propagate through them ? Discuss advantages of graded index fibres over step index fibres. **20**

8. Explain the construction and working of the following : **20**

(i) Optical fibre source

(ii) Optical fibre detector.