

**FOURTH SEMESTER EXAMINATION 2021-22****M.Sc. Physics****Paper - III****Digital Communication**

Time : 3.00 Hrs.

Max. Marks : 80

Total No. of Printed Page : 03

Mini. Marks : 29

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**Note:** Question paper is divided into three sections. Attempt question of all three section as per direction. Distribution of Marks is given in each section.

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**Section - 'A'****Very short answer type questions :**

Q.1 Attempt any six questions from the followings :

**6x2=12**

- (i) What is channel BW for PAM signal ?
- (ii) Define double polarity PAM with diagram ?
- (iii) Write any two advantages of digital communication systems ?
- (iv) What do you mean by internal noise ?
- (v) Define probability density function ?
- (vi) Write expression for power spectral density of nect ?
- (vii) Write expressin for output power due to thermal noise error ?
- (viii) What is role of integrator in PCM transmission system ?
- (ix) Write any two application of LAN ?
- (x) What do you mean by protocols ?

(2)

## Section - 'B'

### Short Answer questions (200 words) :

Q.2 Attempt any four questions from the following :

**4x5=20**

- (i) Differentiate between flat top and natural sampling ?
- (ii) Explain advantages of adaptive delta modulation over delta modulation ?
- (iii) What is digital modulation ? Write key factor of BPSK ?
- (iv) Explain probability density function of Gaussian noise ?
- (v) Deduce an expression for output power due to thermal noise error ?
- (vi) Describe various type of network used in computer communication system ?
- (vii) Discuss about ARPANET ?

## Section - 'C'

### Long Answer type questions :

Q.3 Attempt any four questions from the following :

**4x12 = 48**

- (i) Discuss about source of noise. Derive an expressions for spectral components of noise ?
- (ii) Explain super position of noises. Obtain expression for quadrature components of noise ?
- (iii) What is PCM transmission ? Give block diagram of PCM transmission and explain function of each block ?

(3)

- (iv) Deduce an expression for quantization error power  $N_q$  and obtain the ratio with output signal (i.e.  $S_g/N_q$ )
- (v) What do you mean by BFSK ? Give block diagram for detection of BFSK and obtain necessary expressions. Give its disadvantages ?
- (vi) Discuss about effect of thermal noise in delta modulation and obtain expression for output signal to noise ratio ?
- (vii) Discuss about ISDN with their necessary protocols ?
- (viii) Write short notes on -
  - (a) TDMA
  - (b) TYMNET

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