

Total No. of Questions : 8]

SEAT No. :

PA-1196

[Total No. of Pages : 2

[5925]-218

**S.E. (Electronics/Computer/E & TC) (Semester - IV)**  
**PRINCIPLES OF COMMUNICATION SYSTEMS**  
**(2019 Pattern) (204193)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- 5) Assume suitable data, if necessary.

- Q1)** a) Explain with the help of neat block diagram Armstrong method of FM generation. [6]  
b) Differentiate between NBFM and WBFM. [6]  
c) Explain Pre-emphasis and De-emphasis in detail. [6]

OR

- Q2)** a) With the help of Block diagram explain superheterodyne FM receiver. [6]  
b) With neat phasor diagram explain balanced slope detector in FM. [6]  
c) A frequency modulated signal is given by [6]

$$x_c(t) = 10 \cos \left\{ \left[ 2\pi \times 10^8 t \right] + s \sin \left[ 2\pi \times 200 t \right] \right\}$$

Determine :

- i) The carrier frequency.
- ii) Peak frequency deviation
- iii) The modulation Index

- Q3)** a) Discuss PWM generation and detection in detail. [6]  
b) Distinguish between PAM, PWM and PPM. [5]  
c) What is aliasing? How can it be avoided. [6]

OR

P.T.O.

- Q4)** a) Explain Flat-top sampling with waveforms. [6]  
 b) State and explain the sampling theorem in detail when  $f_s > 2f_m$ ,  $f_s = 2f_m$ ,  $f_s = 2f_m$ . [5]  
 c) Distinguish between Ideal sampling, Natural sampling and Flat-Top sampling. [6]

- Q5)** a) Describe with suitable block diagram pulse code modulation transmitter. [6]  
 b) Explain need of digital communication. [6]  
 c) Describe companding methods  $\mu$ -law and A - law. [6]

OR

- Q6)** a) Draw and explain PCM Receiver. [6]  
 b) Distinguish between DM and ADM. [6]  
 c) Explain in detail distortion in delta Modulation. [6]

- Q7)** a) Draw and explain CCITT hierarchy of multiplexing. [6]  
 b) Draw line code formats for 10110100. [6]  
     i) RZ Unipolar                      ii) NRZ polar  
     iii) RZ polar                        iv) Alternate Mark inversion  
 c) Draw and explain frame synchronizer. [5]

OR

- Q8)** a) What is an eye diagram? Explain the use of eye diagram to measure ISI. [6]  
 b) Explain scrambling and unscrambling with diagram in detail. [6]  
 c) Discuss the properties of line codes. [5]

