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## [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, 23 or Q4, Q5 or Q6, Q 7 or Q8.
2) Near diagrams must be drawn wherever necessary.
3) Figures to the right indicate full marks.
4) Use of Togarithmic 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.
b) Differentiate between NBFM and WBFM. [6]
c) Explain Pre-emphasis and De-emphasis in detail.

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

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

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

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

Q4) a) Explain Flat-top sampling with waveforms.
b) State and explain the sampling theorem in detail when $\mathrm{fs}>2 \mathrm{fm}, \mathrm{fs}=2 \mathrm{fm}$, $\mathrm{fs}=2 \mathrm{fm}$.
c) Distinguish between Ideal sampling, Natural sampling and Flat-Top sampling.

Q5) a) Describe withsuitable block diagram pulse code modulation transmitter.
b) Explain need of digital communication.
c) Describecompading methods $\mu$-law and A - law.

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

Q7) a) Draw and explain CCITT hierarchy ofmultiplexing.
b) Draw line code formats for 10110100 .
i) Rz Unipolar
ii) NRZ polar
iii) Rz polar
iv) Alternate Mark inversion
c) Draw and explain frame synchronizer.

Q8) a) What is an eye diageam? Explain the use of eye diagram to measure ISI.
b) Explain scrambling and unscrambling with diagramn detail.
c) Discuss the properties of line codes.

