2062
B.E. (Electronics and Communication Engineering)
Fourth Semester
EC-401: Communication Engineering

Time allowed: 3 Hours                                    Max. Marks: 50

**NOTE:** *Attempt* <u>*five*</u> *questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I.   Attempt the following:-

a) The modulation technique that uses the minimum channel bandwidth and transmitted power is_____(FM/ DSB-SC/VSB/SSB).

b) In_____(amplitude/frequency/phase) modulation, the frequency of the modulated wave is equal to that of the carrier wave.

c) For wideband FM, the frequency-modulation index is _____ (approximately unity much less than unity / much greater than unity / infinity).

d) In PWM signal reception, the Schmitt trigger circuit is used ___ (To remove noise / To produce ramp signal/For synchronization).

e) When pulse code modulation is applied to non-binary symbols, we obtain a waveform called as_____(PCM / PAM / M-ary).                    (5x2)

## UNIT - I

II.   a) Describe the mathematical analysis of AM.

b) Explain heterodyne receiver structure?                          (6,4)

III.  a) Write working of phase loop lock with block diagram?

b) What are non-linear effects in FM systems?                     (5,5)

IV.   a) What is band-pass sampling?

b) Write short notes on PAM, PWM and PPM?                         (4,6)

## UNIT - II

V.    a) What do you mean by midrise & midtread quantizers?

b) What is companding? Describe A law & $\mu$ law.                (4,6)

VI.   a) Discuss effect of noise in PCM.

b) Write short note on capture effect & FM threshold reduction.   (4,6)

VII.  a) Explain ISI.

b) Describe the different types of encoder: line, bipolar PSD.    (4,6)

x-x-x