(b) When the modulating voltage is 2.4 V the modulation index is 60 for a FM-system with modulating frequency 400 Hz. Calculate the maximum deviation. What is the modulation index when modulating frequency is reduced to 250 Hz and modulating voltage is simultaneously raised to 3.2 V.

(c) Explain, how curve fitting is used to analyze data. **10,6,4**

6. (a) What is Sampling ? Explain, how flat top sampling is superior to other sampling techniques studied.

(b) Describe various elements of PCM system and explain, how pulse code modulation is generated. **12,8**

Unit IV

7. (a) Explain, how location of statellite in an orbit is carried out w.r.t. earth. Also discuss, how one can determine the earth coverage and slant range for geostationary satellite.

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CC-285

M. Sc. EXAMINATION, Dec. 2017

(Third Semester)

(Main & Re-appear)

PHYSICS

PHY-609-B

Analog 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) Show that for Reflex Klystron in field free space between cavities, the transit time for velocity modulator electron depends upon amplitude of applied r.f. signal.

(b) What is Gunn diode ? Describe its working using domain formation theory. **10,10**

2. (a) Compare the transmission of electrical signal through wave guide and two wire transmision lines.

(b) Obtain the field expression for TE modes in a rectangular cavity resonator.

(c) Briefly describe the physical significance of voltage standing wave ratio. **8,8,4**

Unit II

3. (a) Derive the expression for maximum radar-range equation and also explain the factors affecting the range of radar.

(b) Explain the A-scope and Plan Position Indicator (PPI) displays with reference to radars. Also mention the limitations associated with it. **12,8**

4. (a) Using block diagram describe the working of pulsed radar system and also mention how pulsed radar system is superior to continuous radar system.

(b) Define Noise Figure (F), Equivalent Noise Power (ΔN), blind speed (S) and clutter signal. Show that $\Delta N = (F - 1)Gk T_0 B$ where G and B are the overall gain and bandwidth of the receiver respectively. **12,8**

Unit III

5. (a) Discuss various methods used for detection of A.M. waves.

(b) List various advantages and disadvantages of satellite communication. **12,8**

8. (a) What is multiple access technique ? Describe, how Time division multiple Access is used in satellite communication ?

(b) Write notes on any *two* of the following :

(i) Active and Passive Satellite

(ii) Look Angle

(iii) Satellite Frequency Allocation and Band Spectrum. **12,8**

(b) List various advantages and disadvantages of satellite communication. **12,8**

8. (a) What is multiple access technique ? Describe, how Time division multiple Access is used in satellite communication ?

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(i) Active and Passive Satellite

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(iii) Satellite Frequency Allocation and Band Spectrum. **12,8**