Printed Pages : 1 **Roll No.** | | | | | | | | | | | **NEC045**

B. TECH.

THEORY EXAMINATION (SEM–VIII) 2016-17

SATELLITE AND RADAR SYSTEM

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION – A

1. Attempt all parts of the following question: 10 x 2 = 20

(a) What do you mean by direct broadcast satellite television?

(b) What do you mean by noise temperature? What is its importance in relevance to satellite communication.

(c) Explain the video compression process used in Direct Broadcast Satellite television.

(d) What do you mean by Telemetry Tracking and command system?

(e) Give the frequency range of L, Ku and Ka Band for satellite communication.

(f) How the radar range equation depends on wavelength?

(g) What is radar resolution?

(h) What is the highest frequency that radar can be operated if it is required to have a maximum unambiguous range of 200 nmi and no blind speed less than 600 knots.

(i) Give the application of radar.

(j) What is likelihood ratio test?

SECTION – B

2. Attempt any five of the following questions: 5 x 10 = 50

(a) Explain how inter modulation distortion originates in a satellite link, and describe how it may be reduced.

(b) Discuss the effect of solar eclipse on the performance of a geostationary satellite. In what way it is related to fixing the parking place of a satellite.

(c) Explain the system loses in radar and estimate an approximate value for the loss due to each factor.

(d) What do you understand by beam splitting? Describe briefly how beam splitting is accomplisher.

(e) Explain deloy line canceller.

(f) Describe the chief characteristics of the radar echo from a target when its radar cross section is in (i) Rayleigh region, (ii) Resonance region, (iii) Optical region.

(g) Explain the system losses in radar and estimate an approximate value for the loss due to each factor.

(h) Discuss the two ways adopted to make a satellite stable in orbit..

SECTION – C

Attempt any two of the following questions: 2 x 15 = 30

3 (i) Derive an expression for [C/N] of uplink and down link in satellite earth link.

(ii) What is meant by look angels?

An earth station is located at 300 West Longitude and 600 North Latitude. Determine the earth station azimuth and elevation angles with respect to geostationary satellite located at 500 West longitudes. (Assume orbital radius = 42.164 Km and earth's radius = 6378 Km.

4 State and explain the basic position location principle of GPS. Explain GPS segments in brief.

5 Draw Block diagram and explain the operation of an MTI radius.