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Sub Code : NEC045

Paper ID : **131268**

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B TECH
(SEM VIII) THEORY EXAMINATION 2018-19
SATELLITE AND RADAR SYSTEM

Time -3.00 hr

MM-100

Note :- Attempt all section. If require any missing data, then choose suitably

SECTION – A

1. Attempt all question in brief. 2 x 10 = 20

- a) What are the applications of radar.
- b) What do you mean by antenna scan.
- c) What do you mean by maximum unambiguous range.
- d) What do you understand by “False Alarm”.
- e) What is Doppler effect.
- f) Give advantages of Geostationary satellite.
- g) What is meant by azimuth angle.
- h) Define apogee and perigee.
- i) Define ascending node and descending node.
- j) What is mean by ODU and IDU.

SECTION – B

2. Attempt any Three of the following : 10 x 3 = 30

- a) Explain the basic principle of RADAR. Also derive the expression for radar range equation.
- b) Define Pulse Width, Pulse Repetition Time, Average Power, Duty cycle and Missed Detection
- c) What are the different types of system losses in a Radar System. Explain them briefly.
- d) State Kepler’s three laws of planetary motion. Illustrate in each case their relevance to artificial satellites orbiting the earth.
- e) Describe orbital elements of a satellite system.

SECTION – C

3. Attempt any One part of the following : 10 x 1 = 10

- a) What is CW radar. Draw the block diagram of CW radar and explain about simple CW radar.
- b) Describe the frequency response of single delay line canceler. Describe the need of double delay line canceler.

4. Attempt any One part of the following : 10 x 1 = 10

- a) Explain with a neat diagram about sequential lobing.

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- b) Consider a radar with a maximum range of 200 kms. Suppose due to some modifications made in the system components.
- (i) the wavelength of the transmitted energy doubles while the antenna gain become half.
 - (ii) the antenna effective aperture becomes half while the antenna gain triples.
 - (iii) the antenna effective aperture doubles while the wavelength of the transmitted energy remains constant.
- Find the new radar range in all the three cases.

5. **Attempt any One part of the following :** **10 x 1 = 10**

- a) Explain digital MTI Doppler signal processor.
- b) Explain in detail the elements of a satellite communication.

6. **Attempt any One part of the following :** **10 x 1 = 10**

- a) Explain Telemetry, Tracking and command control system.
- b) What is Look angle. How does it calculated with respect to shifting of satellite with respect to earth station.

7. **Attempt any One part of the following :** **10 x 1 = 10**

- a) State and explain the different segments of GPS. What is meant by satellite signal acquisition in GPS.
- b) With the help of block diagram explain the working of DBS Television.