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B.TECH.
(SEM VIII) THEORY EXAMINATION 2022-23
SATELLITE & RADAR SYSTEM

Time: 3 Hours**Total Marks: 70****Note:** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.**2 x 7 = 14**

- (a) Give advantages of Geostationary satellite.
- (b) What is meant by azimuth angle.
- (c) Define ascending node and descending node.
- (d) What is GPRS
- (e) Define Echo. What do you mean by Echo signal.
- (f) What do you mean by maximum unambiguous range.
- (g) What is stalo and coho.

SECTION B

2. Attempt any three of the following:**7 x 3 = 21**

- (a) Explain in detail the elements of a satellite communication.
- (b) Drive the general link equation. Find out the expression for C/N and G/T ratio.
- (c) Explain principle of GPS position. What are different GPS codes.
- (d) Explain the working of pulse radar with the help of suitable block diagram. Also draw radar waveform.
- (e) Explain Conical Scan and its merits over lobe switching.

SECTION C

3. Attempt any one part of the following:**7 x 1 = 7**

- (a) Explain the Kepler's law of planetary rotation. How are these applied to the case of geostationary satellite?
- (b) How a satellite is launched. Hence explain the launching mechanism.

4. Attempt any one part of the following:**7 x 1 = 7**

- (a) What is Look angle. How does it calculated with respect to shifting of satellite with respect to earth station.
- (b) Explain Telemetry, Tracking and command control system. Discuss the different types of telemeter data needed for the satellite.

5. Attempt any *one* part of the following:

7 x 1 = 7

- (a) With the help of block diagram explain the working of DBS Television.
- (b) What is GPS receiver. Show its working with relevant diagram. What are different applications of GPS technology?

6. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Explain the basic principle of RADAR. Also derive the expression for radar range equation.
- (b) A radar is operating at 10 GHz with peak power of 500 kW. The power gain of antenna is 5000 and minimum power of receiver is 10^{-14} . Calculate the maximum range of radar if the effective area of antenna is 10 m^2 and radar cross section is 4 m^2 .

7. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Explain digital MTI Doppler signal processor.
- (b) Explain briefly about amplitude comparison monopulse radar.

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