[Total No. of Questions - 9] [Total No. Printed Pages - 2] (2126)

16293(D) - 0 DEC 2016

**B. Tech 8th Semester Examination**

**Satellite Communication (NS)**

**EC-421(d)**

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

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Attempt five questions in all, selecting one Question from each of the Sections A, B, C and D and all the subparts of questions in section E.

## SECTION - A

1. (a) With the help of a block diagram, explain the general structure of a satellite communication system. Also mention the advantages of satellite communication. (10)

   (b) State Kepler's laws that govern the satellite's movement in an orbit. Explain in detail various parameters of a satellite orbit. (10)

2. (a) What do you mean by orbital perturbations? Explain in detail the longitudinal changes and inclination changes in a satellite orbit. (10)

   (b) Discuss in detail the orbital effects on the performance of satellite communication. (10)

## SECTION - B

3. Explain in detail various subsystems of a communication satellite along with their functions and parameters of importance. (20)

4. (a) What do you understand by Multiple Access technique? Explain in detail the TDMA frame and TDMA burst structure w.r.t satellite communication. (10)

   (b) Discuss in detail the principle and advantages of SCPC system and MCPC system in satellite communication. (10)



## SECTION - C

5. Derive and explain the general link design equation for a satellite communication system. Also discuss various factors that affect the satellite link design. (20)

6. With the help of a block diagram, explain in detail the sub-systems of a satellite earth station transmitter and receiver. (20)

## SECTION - D

7. With reference to communication satellites, explain the following:

   (a) Satellite Telephony

   (b) Important missions (10+10=20)

8. Write detailed notes on the following:

   (a) Remote Sensing Satellites

   (b) Military Satellites (10+10=20)

## SECTION - E (Compulsory Question)

9. (a) Mention frequency bands for satellite communication.

   (b) What is the difference between multiplexing and multiple access?

   (c) Name different types of satellite orbits.

   (d) Explain in brief the effect of eclipse on satellite communication.

   (e) Define noise temperature and the corresponding G/T.

   (f) Explain in brief the concept of CDMA.

   (g) Name a few satellites launched by ISRO along with their application.

   (h) Compare in brief the features of satellite and terrestrial networks.

   (i) Define look angles of a satellite orbit.

   (j) Draw the block diagram of a Tracking, Telemetry and command sub-system. (10×2=20)