

**R15**

Code No: 128EK

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year II Semester Examinations, July - 2019**

**SATELLITE COMMUNICATIONS**

(Common to ECE, ETM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A**

**(25 Marks)**

1. a) Mention the future trends in satellite communication system. [2]
- b) Define Geo stationary and Non Geo-Stationary Orbits. [3]
- c) What is Link Budget? [2]
- d) What is a transponder? [3]
- e) What is mean by low angle fading? [2]
- f) List the features of CDMA. [3]
- g) What are the functions of Earth Station Tracking system? [2]
- h) What is Satellite Navigational System? [3]
- i) What M/G/I queing system standard for? [2]
- j) Give the differences between pure aloha and slotted aloha. [3]

**PART - B**

**(50 Marks)**

- 2.a) Draw the geometry of a geostationary link showing elevation, azimuth and range.
- b) A geostationary satellite moving in an equatorial orbit is at a height of 35786Km from the earth's surface. If the earth radius is taken as 6378 Km, determine the theoretical maximum coverage angle and maximum slant range. [6+4]

**OR**

- 3.a) Compare the three types of satellite orbits.
- b) What are orbital perturbations? Explain the effects of earth's oblateness on orbital inclination of geosynchronous satellite. [5+5]

- 4.a) What is TT&C sub system? Explain it with neat diagrams.
- b) Briefly explain transmission theory in Satellites. [5+5]

**OR**

- 5.a) Explain about satellite antenna equipment with neat diagram and explain each block function.
- b) Explain about orbit control system in detail. [5+5]

6. Explain the Tropospheric and Ionospheric scintillation and low angle fading. [10]

**OR**

- 7.a) Describe the basic principle of CDMA. How FDMA is different from TDMA?
- b) Explain the Spread spectrum Techniques in satellite communication. [5+5]

- 8.a) What type of antennas are used for earth station? Explain working of any one of them with neat structure diagram. [5+5]  
b) Explain the GPS position location principles. [5+5]

OR

9. Draw the block diagram of earth station neatly and explain each block in detail. [10]  
10. What are the different performance parameters of M/G/1 Queing system? Define them. [10]  
OR  
11. Explain the Tree algorithm with example. [10]

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