Code No: 118EK **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, April - 2018
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)	Define the terms Apogee and perigee.	[2]
b)	Discuss atmospheric absorption effects on satellite communications.	[3]
c)	Give the uplink Budget of a Satellite with neat diagram.	[2]
d)	What are the advantages of GPS system?	[3]
e)	What is satellite packet switching?	[2]
f)	Explain the Frequency bands allocation for satellite services.	[3]
g)	Draw the diagram of TT & C subsystem.	[2]
h)	Explain the TDMA frame structure and various components involved in it.	[3]
i)	Explain the advantages and disadvantages in positioning satellite in lower orbit.	[2]
j)	Describe the Pure ALOHA scheme.	[3]

PART - B

(50 Marks)

2. Obtain the orbit equation for an elliptical orbit and prove that the orbital time period T, is given by $T^2 = 4\pi^2 a^3 / \mu$, where a=Semi major axis. [10]

OR

3.a) Define the terms
i) Ascending and descending nodes
ii) Sun-synchronous orbit
iii) Angle of inclination.

b) Define look angles and derive the expressions for the elevation and azimuth angles.[5+5]

4. Write short notes on:
a) EIRP b) Carrier to Noise Density Ratio
c) Energy bit to noise density ratio d) G/T ratio. [10]

OR

5.a) Derive the relation between saturation flux density and carrier to noise ratio.

b) What is Link Budget? Explain Uplink Budget of a Satellite with neat diagram? [5+5]

6.a) Distinguish the terms multiplexing and multiple Access. Give the calculation procedure of C/N ratio.

b) What is Inter modulation in FDMA? [5+5]

OR

7.a) Explain TDMA frame structure.

b) What are the different types of demand assignment multiple Access characteristics?[5+5]

8. Draw the transmitter and receiver block diagrams of an earth station and explain its Working. [10]

OR

9.a) Explain about the GPS receivers and its codes.

b) Explain about the Differential GPS. [5+5]

10.a) Define Packet and explain in detail about Packet Reservation.

b) Discuss message transmission by TDMA. [5+5]

OR

11. Write short notes on:
a) Tree Algorithm
b) M/G/I Queue. [5+5]

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