CLASS: M.TECH/PRE-PHD   SEMESTER : I / NA
BRANCH: ECE   SESSION : MO/18

SUBJECT: EC517 SATELLITE BASED WIRELESS COMMUNICATION
TIME: 3:00 HRS.   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)   What is Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's   [5]
         third law of planetary motion.
Q.1(b)   Explain the procedure of launching of satellite in geostationary orbit and find the escape velocity   [5]
         of a spacecraft launched from an earth orbit with an altitude of 300 km.

Q.2(a)   Define noise figure and system noise temperature. Derive the expression for equivalent noise   [5]
         temperature and find (i) noise factor and (ii) equivalent noise temperature for an amplifier having
         noise factor 7:1.
Q.2(b)   Analyze the effects of the following on satellite link (i) rain and ice (ii) depolarization (iii)   [5]
         atmospheric absorption and (iv) Scintillation effects.

Q.3(a)   Distinguish between preassigned and demand assigned multiple access technique and Compare   [5]
         centralized and distributed DAMA system.
Q.3(b)   Draw the frame format of TDMA and determine the expression of frame efficiency. A TDMA system   [5]
         operates at 100 Mbps with a 2ms frame time. Assume that all slots are of equal length and guard
         time 1 micro sec is required between slots. Find the efficiency of the communication resource for
         the case of 1, 2, 5 and 10 slots per frame.

Q.4(a)   Compare single beam and multi beam satellite with their advantages and disadvantages.   [5]
Q.4(b)   Explain and interpret the different methods of interconnections of satellite networks like   [5]
         Interconnection by Transponder Hopping, Interconnection by On-board Switching and
         Interconnection by Beam Scanning.

Q.5(a)   Distinguish fixed point satellite network and mobile satellite network with example.   [5]
Q.5(b)   Discuss GPS and differential GPS and explain how to find position location in GPS system.   [5]

:::::07/12/2018 M::::