Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 51270

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Eighth Semester

Electronics and Communication Engineering

080290077 — SATELLITE COMMUNICATION

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a transponder?

2. Differentiate geosynchronous and a geostationary satellites.

3. Define G/T ratio of an earth station.

4. What do you mean by troposphere?

5. Define frame efficiency.

6. What is traffic burst?

7. State the need of an LNBC.

8. List the important components of an earth station.

9. How satellite is useful in enhancing the capacity of mobile communication?

10. Differentiate broadcast and multicast.

PART B — (5 × 16 = 80 marks)

11. (a)   State Kepler's law of orbiting bodies and derive an equation to show that the third law is true for any orbiting satellite.

Or

(b)   A geostationary satellite is orbiting at 42050 kM. If the radius of orbit of earth is 6385 km and sun's declination is 7°15!, Calculate the duration of eclipe. Also calculate the starting time of eclipse if the satellite longitude is 82°E'.

12. (a) A satellite receiving systems consists of an aerial woreguide runs from aerial to the input of the first amplifier, low noise first amplifier and succeeding stages derive an expression for the system noise temperature in terms of standard parameters.

Or

(b) A video signal has a deviation of 12 MHz and a video bandwidth of 5.5 MH weighting. The emphasis improvement is 1.3 dB and weighing improvement is 1.2dB. Calculate

(i) Band width requirement of receiver using Carson's rule. (5)

(ii) Signal to noise power ratio, given $\dfrac{C}{N} = 22dB$. (5)

(iii) Video signal to noise ratio. (6)

13. (a) Draw the scheme of a PCM/TDM/PSK/TDMA link and explain its essential operations procedure if a super group of VC has to be transmitted.

Or

(b) A BPSk TDMA system is to transmit 1200 digital voice channels, each with 4 bits per sample at a 64 kbps rate. The system must accomodate 1000 bits/slot at a frame efficiency of 92Y.

(i) What is the number of slots in a frame? (4)

(ii) What is the length of TDMA frame? (4)

(iii) How many preamble bits can be used? (4)

(iv) What is the required satellite bandwidth? (4)

14. (a) Examine the effectiveness of:

(i) TVRO (6)

(ii) MATV (5)

(iii) CATV. (5)

Or

(b) Describe the measurements of the following in detail.

(i) $\dfrac{G}{T}$ (4)

(ii) C/No (4)

(iii) EIRP (4)

(iv) Antenna gain. (4)

15. (a) Critically examine the operation and applications of

     (i)   DTH   (4)

     (ii) DAB   (4)

     (iii) BTV   (4)

     (iv) GRAMSAT.   (4)

Or

(b) Write detailed notes on the following :

     (i)   VSAT   (4)

     (ii) Remote sensing   (4)

     (iii) Digital video Broadcast   (4)

     (iv) INMARSAY.   (4)

——————