Question Paper Code : 80315

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Electronics and Communication Engineering

EC 6004 – SATELLITE COMMUNICATION

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kepler's First and third law.
2. What is the limit of visibility?
3. Examine why noise temperature is a useful concept in communication receivers?
4. Formulate uplink and downlink equation of a satellite access.
5. Write the features of MATV.
6. A satellite downlink at 12 GHz operates with a transmit power of 6 W and an antenna gain of 48.2 dB. Calculate the EIRP in dbw.
7. Point out the pre-assigned TDMA satellite access.
8. How does the spread spectrum system differ from conventional communication system?
9. What do you infer about GRAMSAT?
10. Outline the three regions to allocate the frequency for satellite services.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Illustrate the orbital parameters used for positioning a satellite. (8)

(ii) Estimate the suitable equations for look angles and the range for geostationary satellite. (8)

Or

(b) (i) Categorize the frequency allocations and draw the frequency spectrum for satellite services. (12)

(ii) Illustrate the effects of non-spherical earth. (4)

12. (a) (i) Justify the reasons behind why the transponders are connected in the communication channel with a neat diagrams. (4)

(ii) Analyze the wideband receiver and input de-multiplexer with appropriate diagrams. (12)

Or

(b) Examine how the attitude and orbit control system (AOCS) is achieved through spin stabilization systems? Give necessary diagrams. (16)

13. (a) (i) Point out the calculation of link power budget equation. (4)

(ii) List the various types of system noise. Explain it in detail. (12)

Or

(b) (i) Derive the expression of output back-off, satellite TWTA output for the downlink communication. (8)

(ii) Calculate the carrier-to-noise-ratio for the combined uplink and downlink communication. (8)

14. (a) (i) Express FDMA in detail and also enumerate the interference in FDMA. (8)

(ii) Explain direct sequence spread spectrum communication in detail. (8)

Or

(b) (i) Identify the band limited and power limited TWT amplifier operation. (10)

(ii) Explain the operation of digital TASI in TDMA operation. (6)

15. (a) Elaborate the main features, and services offered by mobile satellite systems. (16)

Or

(b) Discuss the services of the following system with its usage. (4

(i) INTELSAT. (4

(ii) E-mail (4

(iii) BTV (

(iv) DTH.
