Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 20540

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fifth Semester

Computer and Communication Engineering

CEC 352 – SATELLITE COMMUNICATION

(Common to : Electronics and Communication Engineering and Electronics and Telecommunication Engineering)

(Regulations – 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   When does the satellite remain in orbit forever?

2.   List the kinds of hydrazine used for LV propulsion.

3.   Write the relationship between antenna gain and transmitter EIRP.

4.   Why is the box structure used for many three-axis satellites?

5.   Why is it a general practice to express all link parameters in decibels?

6.   List the examples for return link applications.

7.   What are the types of multiple access?

8.   State the functions of a typical CDMA receiver.

9.   List the basic ways that the satellite transfers TV signals to the consumer.

10.   Compare LEO and MEO systems.

PART B — (5 × 13 = 65 marks)

11. (a) Explain how a satellite is placed in a geostationary orbit.

Or

(b) Define the types of orbital parameters. Explain the features of typical launch vehicles.   (6+7)

12. (a) Explain the block diagram of generalized space craft TTC system.

Or

(b) Explain the applications of thermal control in space craft design.

13. (a) Explain the design aspects of satellite link. Draw the block diagram and equivalent circuit of earth station receiver for system noise temperate calculation.   (9+4)

Or

(b) List the tropospheric effects on satellite link. Explain the steps of link budget analysis of downlink.   (5+8)

14. (a) Explain the difference between PAMA and DAMA.

Or

(b) Derive an expression for equivalent voice channel capacity of a TDMA system. Draw the frame structure of TDMA.   (9+4)

15. (a) Draw the block diagram of outdoor and indoor units of VSAT terminal.

Or

(b) Draw the schematic diagrams for GPS position location on a plane, GPS position location in space and ECEF coordinate system.   (6+3+4)

PART C — (1 × 15 = 15 marks)

16. (a) List the merits of VSAT system. Draw the star and mesh configurations of VSAT network.   (7+8)

Or

(b) List the features of spread spectrum technology. Compare CDMA, TDMA and FDMA systems.   (5+10)

_____