Reg. No. : | | | | | | | | | | | | |

# Question Paper Code: 1056421

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV / DEC 2024
Sixth Semester
Electronics and Communication Engineering
U20EC604 – SATELLITE COMMUNICATION AND REMOTE SENSING
(Regulation 2020)

Time: Three Hours | Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. Distinguish ascending and descending nodes.

2. A satellite moving is orbiting in the equatorial plane with a period from period from perigee to perigee of 12hrs. Given the eccentricity is 0.02. Calculate the semi major axis. The earth's equatorial radius is 6378.1414 km.

3. Define payload and transponder.

4. Examine why noise temperature is a useful concept in communication receivers.

5. The range between a ground station & a satellite is 42000km. Calculate the free space loss a frequency of 6GHZ.

6. Write about demand assigned TDMA satellite access.

7. Classify the type of platforms used in satellite communications.

8. Outline the role of thermal sensors in data acquisition for satellite communication.

9. Identify the different types of remote sensing data products.

10. Compare the merits and demerits of visual (human) and digital interpretation techniques.

PART – B (5 x 16 = 80 Marks)

11. (a) (i) A satellite is in an elliptical orbit with an eccentricity of 0.6 and perigee altitude 1000 Km.
Determine:
a) The semi major axis
b) The period of revolution (8)

(ii) Explain Kepler's three laws of motion with suitable diagrams. (8)

(OR)

(b) (i) Discuss the effect of non-spherical earth atmospheric drag on the satellite orbit. (8)

(ii) How does rain attenuation affect satellite communications? Explain the factors influencing rain attenuation. (8)

12. (a) Explain in detail with necessary schematics the spin stabilization technique and momentum wheel stabilization technique to keep satellites attitude control. (16)

(OR)

(b) Explain the working of telemetry, tracking and control with a suitable diagram.(16)

13. (a) (i) Classify the different types of transmission losses in satellite communication with necessary expression. (8)

(ii) Examine the following: input backoff, output backoff and earth station HPA. (8)

(OR)

(b) Compare and contrast the salient features of FDMA, TDMA and CDMA. (16)

14. (a) Determine the features, capabilities, and applications of Earth Resources Satellites, focusing on LANDSAT, SPOT, and IRS satellites. (16)

(OR)

(b) Explain the concept of resolution in the data acquisition of satellite systems, discussing spatial, spectral and radiometric resolutions. (16)

15. (a) With suitable examples, Discuss the importance of atmospheric and Geometric corrections in data analysis. (16)

(OR)

(b) Discuss the elements of image interpretation with suitable diagrams. (16)

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