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Question Paper Code : 23426

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Eighth Semester

Electronics and Communication Engineering

EC 2045 — SATELLITE COMMUNICATION

(Regulations 2008)

(Common to PTEC 2045 – Satellite Communication for B.E. (Part-Time)
Seventh Semester – ECE – Regulations 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kepler's First Law and write down the formula for eccentricity.
2. What are the three pieces of information that are needed to determine the look angles for the geostationary orbit?
3. Why is thermal control necessary in Satellite Subsystem?
4. What is a transponder?
5. Differentiate between multiple access from single access.
6. Name any two analog transmission techniques.
7. Define G/T ratio.
8. What are the various components of an earth station?
9. Highlight the features of MEO.
10. List any four services of IMMARSAT.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the diagram showing satellite eclipse and satellite sun transit around spring and autumn equinoxes and explain. (8)
- (ii) Mention the terms used to describe the position of the orbit with respect to the earth and also define any four parameters. (8)

Or

- (b) (i) Discuss about the effects of a nonspherical earth. (8)
- (ii) Write briefly about satellite launch vehicles. (8)
12. (a) (i) Describe briefly about attitude control and also draw and explain the terms pitch, roll and yaw. (12)
- (ii) An antenna has a noise temperature of 35 K and is matched into a receiver which has a noise temperature of 100 K. Calculate (1) the noise power density and (2) the noise power for a bandwidth of 36 MHz. (4)

Or

- (b) (i) Describe the TT and C facilities of a satellite communication system with a neat sketch. (10)
- (ii) Derive the link - power budget equation. (6)
13. (a) (i) Draw and explain a basic TDM system. (12)
- (ii) A video signal of bandwidth 4.2 MHz is used to frequency modulate a carrier, the deviation ratio being 2.56. Calculate the peak deviation and the signal bandwidth. (4)

Or

- (b) Define what is demand assigned FDMA and Explain in detail the operation of the Spade system of demand assignment. What is the function of the common signaling channel? (16)
14. (a) (i) Explain clearly the arrangement of a master antenna TV system. (10)
- (ii) For a satellite circuit the individual link carrier-to-noise spectral density ratios are: uplink 100 dBHz; downlink 87 dBHz. Calculate the combined C/N_0 ratio. (6)

Or

- (b) (i) What is meant by redundant in redundant earth station? And also explain the basic elements of a redundant earth station with a neat sketch. (12)
- (ii) Define EIRP and explain. (4)

15. (a) (i) What is a GPS? Explain why a minimum of four satellites must be visible at an earth location utilizing the GPS system for position determination. What does the term dilution of position refer to? (8)
- (ii) Write in detail about the features of Business TV. (8)

Or

- (b) (i) Give brief notes on INSAT system. (8)
- (ii) Write a brief note on video conferencing and E-mail. (8)
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