Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 71220

M.E. DEGREE EXAMINATION, JUNE/JULY 2013.

Second Semester

Communication Systems

CU 9224/CU 924/10244 CM 204 — SATELLITE COMMUNICATION

(Common to M.E. Network Engineering, M.E. Computer Networks,
M.E. Computer Networking and Engineering and M.E. Communication and
Networking)

(Regulation 2009/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why uplink frequencies of satellite systems are higher than downlink frequencies?

2. What are transponders?

3. List the various types of multiplexing schemes.

4. What is the salient feature of demand assigned multiple access technique?

5. Define the term 'EIRP'.

6. What is meant by 'frequency reuse'?

7. What are the merits of GPS systems?

8. Mention about the codes used in GPS.

9. Why VSAT's are highly recommended?

10. What are the prime objectives of INTEL series?

PART B — (5 × 16 = 80 marks)

11. (a) What are launch vehicles? Explain the launching of GSO satellites using space shuttle launchers. Provide necessary diagrams.   (16)

Or

   (b) With neat sketches, explain the various communication sub systems present in a satellite system with emphasis on their functions.   (16)

12. (a) With necessary diagrams, give a complete overview on various modulation/multiplexing schemes employed in satellite communication systems. (16)

Or

(b) Compare and contrast FDMA, TDMA and CDMA schemes in the context of satellite systems. (16)

13. (a) Derive the expressions of carrier-to-noise ratio for overall satellite link using $\left(\dfrac{C}{No}\right)_{uplink}$ and $\left(\dfrac{C}{No}\right)_{downlink}$, starting from received power flux density. Also obtain the $\left(\dfrac{C}{I}\right)_{overall}$ for satellite systems. (16)

Or

(b) Elaborate on various atmospheric and ionospheric related losses which affect the satellite performance. Show the graphical proof for attenuation characteristics verses frequency. (16)

14. (a) (i) List out the applications of navigational and GPS satellite. (6)

(ii) Elaborate on the GPS position location principles. (10)

Or

(b) Give a detailed note on GPS receiver operation and its characteristics. Also highlight the significance of differential GPS. (16)

15. (a) In detail, with suitable diagrams and illustrations, explain the various Broadcast satellite services (BSS). (16)

Or

(b) Differentiate fixed satellite services with mobile satellite services. Bring out all the operational challenges associated with mobile satellite. Also list out its applications. (16)

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