VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Sem & Sec: III /M.E.,(CS) Code: CU7301

ADVANCED SATELLITE BASED SYSTEMS

QUESTION BANK

UNIT-1:
NAVIGATION, TRACKING AND SAFETY SYSTEMS

Part-A

1. How does GPS work?
2. What is GNSS?
3. What are the uses of GPS?
4. Mention the factors that affect the accuracy of GPS measurements?
5. What are the types of errors in GPS measurements?
6. What is trilateration?
7. Define NAVSTAR GPS?
8. What are the building blocks of GPS?
9. Give the information required to locate the receiver.
10. List the functional segments of GPS?
11. Define the characteristics of space segment?
12. Write the two types of codes used in GPS?
13. Define RANN.
14. What is the function of control segment?

15. What are the components of control segment?
16. Define user segment.
17. What is elective availability?
18. Define anti-spoofing.
19. Write the functions of Sarsat distress system.
20. Write the functions of Inmarsat distress system.

Part-B

1. With a neat sketch, explain the working of GPS receiver.
2. In detail, explain the functions of global satellite navigation systems.
3. Explain about GPS positioning and location identification.
4. Describe the characteristics of transit and timation systems of GPS.
5. In detail, explain the functional segments of GPS.
6. Draw the diagram of GPS satellite constellation and explain.
7. Explain about the sources and type of errors of GPS measurement systems.
8. Explain how the 3-dimentional position and velocity information is determined using GPS.
9. Explain about the interdisciplinary applications of GPS satellite with examples.
10. Describe the functional characteristics of regional navigation system.
11. Write short notes on i) Sarsat ii) Inmasat
12. What is the location based services provided by GPS satellite? Explain with examples.

UNIT 2:
INERTIAL NAVIGATION AND DIFFERENTIAL GPS SYSTEMS

PART-A

1. Define inertial navigation system.

2. What are the advantages of INS?

3. What are the disadvantages of INS?

4. Give example for inertial navigation technologies.

5. List common error models in INS.

6. What are altitude sensors?

7. What are acceleration in INS?

8. What are the types of acceleration in INS?

9. Write principal coordinate systems of INS?

10. Give the implementation issues of gimbal systems?

11. What are the system level errors in INS?

12. Define Coriolis Effect?

13. Compare GPS and differential GPS?

14. How does DGPS work?

15. Write the components of Differential GPS?

16. What are the error sources in DGPS?

17. Define LADGPS?

18. Define WADGPS?

19. What is the mission of WAAS?

20. What is GUS?

PART-B

1. Explain the different types of common error models in INS?
2. Write short notes on (i) altitude sensors (ii) navigation co-ordinates?
3. Explain the types and error models of accelerometer sensors?
4. Describe the functional implementation of one and three dimensional INS?
5. Draw the INS initialization process and also explain about INS alignment?
6. Explain the classification of earth models in intertial and satellite navigation system?
7. What are the system level error sources? Explain with navigation error propogation?
8. Explain the functional and characteristics of WAAS with neat diagram?
9. Draw and explain the block diagram of GUS control loop and IOT test setup?
10. Describe the different process of involved in GUS clock steering algorithm?
11. Explain the geometric analysis of GEO satellite orbit determination?
12. Explain about the implementation and design issues of gimbal and strapdown systems

Unit –III
REMOTE SENSING SYSTEMS AND TECHNIQUES

PART –A

1. What are the component present in optical fiber sensors?
2. How does optical fiber sensor works?
3. Define coupling efficiency?
4. What ere the advantages of optical fiber sensors?
5. What are the types of optical fiber sensors?
6. What is remote sensing?
7. What are the components of an ideal remote sensing?
8. What are the advantages of RS?
9. What are the limitations of RS?
10. What are the two types of data acquisition systems?
11. What are the types of resolution in RS?
12. What is the function of Landsat?
13. Write the three characteristics of optical sensors?
14. What is meant by information extraction in remote sensing?
15. Differentiate image interpretation and image processing?
16. What are the types of information extraction in remote sensing?

17. Give the elements used in image interpretation?
18. What is geoeye?
19. Define digital globe?
20. What is the function of Meteosat?

PART-B

1. Explain the systematic, non-systematic distortion and image geometry in a remote sensing image processing?
2. Explain the spatial, temporal and characteristics of information extraction from digital images?
3. How the digital images are interpreted and transformed into classified images?
4. What are the image interpretation keys required for RS images? Explain?
5. Explain the classification of remote sensing sensors?
6. What are the characteristics of optical sensors? Explain with example?
7. Draw the flow graph of the image interpretation process. Explain?
8. Describe the function of geoeye-1 sat in commercial imaging system?
9. List the functions of digital globe in commercial satellite imaging system?
10. Describe the functions and characteristics of non-optical sensors?
11. Explain how does the Landsat work in remote sensing application?
12. .Explain the uses of Meteosat weather satellite in meteorology application?

UNIT – IV
BROADCAST SYSTEMS

PART-A

1. What are the two satellite services provided by American Broadcasting Company?
2. What is Sirius satellite radio?
3. What is XM satellite radio?
4. Define merger in satellite radio system?
5. What are the services of satellite radio?
6. Define the term MBCO?
7. What is DTH?
8. How does DTH work?

9. Differentiate DTH and cable TV?
10. What is global broadcast service?
11. What are the applications of INSAT syatem?
12. Write the uses of business TV?
13. Give the satellite mobile services?
14. What are the implementation issues of DTH?
15. What are the Factors that affect the design of DTH receiver?
16. What is the mission of 1worldspace?
17. Define ASTRA.
18. What is the use of Eutelsat in DTH services?
19. What is dish network?
20. Give example for audiovisual services of satellite.

PART-B

1. Draw the block diagram of 1worldspace receiver and explain?
2. List and explain the functions of the XM satellite radio channels?
3. List and explain the Sirius satellite radio channels?
4. Explain about direct satellite based multimedia broadcasting systems?
5. Explain about European initiatives in satellite radio system?
6. Compare DTH and cable TV services. Explain?
7. Explain the functions of representative DTH systems in different regions?
8. Explain the implementation issues and services of DTH television?
9. Describe the services of GBS in defense information systems?
10. Explain the usage of GBS in US military division?
11. How does the GRAMSAT support domestic communication sat systems?
12. Explain the services of satellites in E-mail, internet telephony and video conferencing.

UNIT V
SATELLITE NETWORKING SYSTEM WITH IPv6

PART-A

1. What is the use of IPv6 in satellite networks?

2. Compare IPv4 and IPv6.

3. What is the address space of IPv6?

4. Give example for special IPv6 addresses.

5. What are the constraints for interworking mechanisms?

6. Define tunneling and its types.

7. Write the addressing conventions in IPv6.

8. What is the use of unicast address for IPv6 host?

9. How the address is assigned to IPv6 router/

10. What are the two support mechanisms for IPv6?

11. What are the functionalities supported by ICMPv6?

12. What is routing?

13. What is the information available in routing table?

14. Name the parameters to be configured in IPv6 host.

15. What is address auto configuration process?

16. What is the use of DHCP?

17. Give example for DHCP terminology.

18. Draw IPv6 header format.

19. Write the reasons to migrate from IPv4 to IPv6.

20. What is traffic class field in IPv6 header?

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PART-B

1. Draw the block diagram of service models for IPv6 over satellite networks and explain.
2. Explain the use of IPv6 on IPTV and satellite communication.
3. Draw and explain the different fields of IPv6 header format.
4. Explain the migration and coexistence of IPv4 and IPv6.
5. List and explain the addressing mechanisms of IPv6.
6. Explain the different types of addresses for host and routers.
7. Explain the PDU format and the flow of IPv6 packets in a VoIP environment.
8. Write notes on i) IPv6 infrastructure ii) Route management
9. Explain the sequence of address auto reconfiguration process for an IPv6 host.
10. Describe the functions of DHCP with terminologies, messages and addresses.
11. Write notes on i) IPv6 benefits ii) traffic classes
12. Describe the functions of IPv6 related protocols in satellite networking.