Register Number: ……………………..

B.E., DEGREE EXAMINATIONS: NOV/DEC 2012

Seventh Semester

AERONAUTICAL ENGINEERING

AER139**:** Satellite Communications

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The RF frequencies range is
   a) 300MHz-300GHz   b) 30MHz-30GHz
   c) 30MHZ-300GHZ   d) 300MHZ-30GHz

2. The point where the orbit crosses the equatorial plane from north to south
   a) Ascending node   b) Descending node
   c) Apogee   d) Perigee

3. Sampling theorem states that
   a) $Fs \leq Fm$ b) $Fs \leq 2Fm$
   c) $Fs \geq Fm$ d) $Fs \geq 2Fm$

4. The major source of any loss in ground-satellite link is
   a) Absorption   b) Attenuation
   c) Free-Space Spreading Loss d) Bending loss

5. A network which contains resistive elements are called as
   a) Reactance networks   b) Absorptive networks
   c) Susceptible networks   d) Additive networks

6. Only one carrier uses the transponder at any one time. This access is called as
   a) SDMA   b) FDMA
   c) CDMA   d) TDMA

7. Combination of ARQ methods with FEC are called
   a) Go-Back-N ARQ systems   b) Selective Repeat ARQ systems
   c) Hybrid ARQ systems   d) Stop and Wait ARQ systems

8. Variations in the amplitude, phase, polarization or angle of arrival of radio waves are
   a) Scintillations   b) Absorption
   c) Polarization rotation   d) Attenuation

9. The direct broadcast satellite television is also known as
   a) Intelsat   b) Direct-to-Home
   c) Inmarsat   d) Radarsat

10. The antenna which radiates power in all directions

    a) Yagi antenna   b) Horn antenna

    c) Slot antenna   d) Isotropic antenna

PART B (10 x 2 = 20 Marks)

11. Define Apogee and Perigee.

12. What is Doppler's shift?

13. Write the Friss transmission formula and name the parameters.

14. What is Figure Of Merit?

15. Define Nyquist criteria for sampling.

16. Define PCM and mention the important operations performed in it.

17. Define attenuation.

18. What are linear block codes?

19. What are the four major subsystems of an Earth station?

20. Mention the types of reflectors available.

PART C (5 x 14 = 70 Marks)

21. a)   Explain about the Orbital perturbations and orbital effects in satellite performance.

(OR)

    b) (i) Brief about the Orbital elements.   (7)

        (ii) Explain in detail how to determine the look angles.   (7)

22. a) (i) Explain any one spacecraft subsystems   (7)

        (ii) Briefly describe the design of a Satellite Uplink.   (7)

(OR)

    b)   Elaborately explain the TT&C and Communication subsystem.

23. a)   Describe the analog television transmission in detail.

(OR)

    b) (i) Write notes on QPSK system.   (7)

        Write notes on TDM.   (7)

24. a) What are binary cyclic codes and explain its generation, error detection & correction capabilities.

(OR)

b) Explain about the propagation on satellite –earth paths and its influence on link design.

25. a) Explain about the design and equipments of analog and digital earth stations.

(OR)

b) (i) Write notes on INTELSAT and INMARSAT. (7)

   (ii) Write notes on DBS. (7)

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