

ET703M - Radar and Satellite Communication

P. Pages : 2

Time : Three Hours



GUG/S/25/14249

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Assume suitable data wherever necessary.
 3. Illustrate your answers wherever necessary with the help of neat sketches.

1. A) Write a note on Circulator as Duplexer. 8
- B) Find the maximum Detectable range of Radar for the specifications given below : 8
Radar Cross-sectional area of target, = 20 sq. m
Operating frequency = 12 GHz
Capture area of receiving antenna, = 4 sq. m
Peak pulse transmitted Power = 500 kW
Minimum detectable Power of signal = 10^{-10} W
- OR**
2. A) Explain the following Radar terms: 8
i) Range
ii) Minimum Range
- B) With neat block diagram explain Pulse Compression Radar. 8
3. A) Define following MTI Radar terms: 8
i) Clutter detectability factor.
ii) Clutter attenuation (CA)
iii) Inter clutter visibility (ICV)
iv) Filter mismatch loss.
- B) Write a note on construction and working of parabolic reflector antenna with Gregorian feed used in Radar systems. 8
- OR**
4. A) An MTI Radar operates at a frequency of 6 GHz with a pulse repetition frequency of 1 kHz. Find the first, second and third Blind speeds of this Radar. 8
- B) Write a note on Radiation patterns and feed arrangements for array antennas in a radar system. 8
5. A) i) Define the following terms for Earth-Orbiting Satellites: 4
1) Apogee 2) Inclination
- ii) List the Pros and Cons of Satellite Communication. 4

B) Explain the orbital equations and derive for orbital velocity equation. 8

OR

6. A) Explain what is meant by the geostationary orbit. How do the Geostationary orbit and Geosynchronous orbit differ? 8

B) State Kepler's three laws of planetary motion. Illustrate in each case their relevance to artificial satellites orbiting the earth. 8

7. A) Write a note on FDMA in satellite Communication. 8

B) Explain what is meant by satellite altitude and briefly describe two forms of altitude control. 8

OR

8. A) Explain briefly what is meant by sun transit outage? 8

B) Explain the ionospheric effects on signal travelling between earth station and satellite. 8

9. A) Write a short note on GSM services. 8

B) With neat block diagram explain working principle of DBS TV receiving system. 8

OR

10. A) Write a short note on Community Antenna TV (CATV) system. 8

B) Explain operation of any two types of transponders with block diagram. 8
