B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electronics and Communication Engineering

EC 010 603—RADIATIONS AND PROPAGATION (EC)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. Define Antenna temperature.

2. What are called grating lobes ?

3. Write short notes on smart antennas.

4. What are the properties of binomial arrays ?

5. What is meant by space wave propagation ?

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain the structure of ionosphere.

7. Derive the relationship between Maximum Usable Frequency (MUF) and Critical Frequency (FC)

8. Explain briefly about phased arrays.

9. What is meant by duct propagation ?

10. Define (a) beam solid angle ; (b) antenna polarisation.

(5 × 5 = 25 marks)

Part C

Answer all questions.
Each question carries 12 marks.

11. Derive the power radiated and radiation resistance of current element.

Or

Turn over

12. What is meant by antenna efficiency ? How it is related with radiation resistance and what are the different factors on which radiation resistance depends on ?

13. Explain the principle and design procedure for a Dolph-Chebyshev arrays.

Or

14. What is meant by an end fire array ? How will you design an EFA ? Derive the equation for directivity of an EFA.

15. Explain the principle and working of ground penetrating RADAR.

Or

16. Explain briefly about (a) Lag periodic antennas ; (b) Reflector antennas and their feed system.

17. Explain briefly about (a) Fading ; (b) Diversity reception.

Or

18. Explain briefly about ground wave and sky wave propagation. Calculate the field strength at a distance due to ground wave.

19. Explain the process of measurement of impedance efficiency.

Or

20. Explain the measurement procedure of directional pattern and polarisation.

$(5 \times 12 = 60 \text{ marks})$