



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Programme 5th Semester Examination, 2021-22

**ELSGDSE02T-ELECTRONICS (DSE1)**

**ANTENNA THEORY AND WIRELESS NETWORKS**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.  
Candidates are required to give their answers in their own words as far as practicable.  
All symbols are of usual significance.*

**GROUP-A**

1. Answer any **five** questions from the following: 2×5 = 10
- (a) What do you mean by equivalent noise resistance?
  - (b) What is effective aperture of an antenna?
  - (c) What is antenna temperature?
  - (d) What are near and far field regions of an antenna?
  - (e) Define effective height of an antenna.
  - (f) Define critical frequency and MUF.
  - (g) What do you mean by directivity of an antenna?
  - (h) Define Radiation intensity and Beam efficiency of Antennas.

**GROUP-B**

- Answer any eight questions from the following** 5×8 = 40
- 2. What do you mean by the term 'Antenna Gain' and 'Power gain'? 5
  - 3. Derive the relationship between directive gain and effective aperture of an antenna. 5
  - 4. Derive an expression for radiation resistance of a short electric dipole. 5
  - 5. Write short notes on: 5
    - (i) Yagi-Uda array, (ii) Parabolic reflector

6. Explain the construction and field patterns for microstrip line. 5
7. Starting from electric and magnetic potentials, obtain the far field components of a loop antenna. 5
8. Show that the radiation resistance of a half wave dipole antenna is  $73 \Omega$ . 5
9. Define virtual height and skip distance. Obtain the relation between MUF and skip distance. 2+3
10. Write a short note on space wave propagation. 5
11. Differentiate between 3G and 4G networks. List the key features of 4G networks from the user point of view. 5
12. Write short notes on wireless PAN. 5
13. What are the advantages of wireless LAN? Mention some of the disadvantages of WLANS. 5

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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