

Roll No. ....

**24235**

**B. Tech. 5th Semester (ECE)  
Examination – February, 2022**

**ANTEENA, WAVE PROPAGATION & T. V. ENGG.**

Paper : EE-307-F

Time : Three Hours ]

[ Maximum Marks : 100

Before answering the questions, candidates should ensure that they have  
been supplied the correct and complete question paper. No complaint in  
this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting one question  
from each Section. Question No. 1 is compulsory.  
All questions carry equal marks.

1. (a) Draw radiation pattern of a horizontal dipole.
- (b) What is duct propagation ?
- (c) Define directivity and beam width.
- (d) Explain sound reception synchronization.
- (e) State pattern multiplication.  $4 \times 5 = 20$

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P. T. O.

**SECTION - I**

- 2. Define gain, directivity and radiation resistance. Also explain in detail Reciprocity theorem for antenna. 20
- 3. (a) Explain the concept impedance of antenna. 10  
(b) Derive the expression for the radiated field from a short dipole. 10

**SECTION - II**

- 4. (a) Explain in detail fields and pattern of an infinitesimal dipole. 10  
(b) Describe in detail various potentials used in antenna theory. 10
- 5. Describe wave equation for radiated fields from current and voltage sources in terms of electric scalar potential and magnetic vector potential. 20

**SECTION - III**

- 6. (a) Find the expression for two point sources with currents equal in magnitude and phase. 10

24235- (P-3)(O-9)(22) ( 2 )

- (b) Explain in detail synthesis of an array. 10

- 7. Explain concept of space wave propagation. Also discuss effect of earth, duct formation, ionosphere and skywave. 20

**SECTION - IV**

- 8. Differentiate picture transmission with sound transmission. Also discuss monochrome picture tube and beam deflection in detail. 20

- 9. Write short notes on : 20

- (i) Duct formation
- (ii) Vidicon

24235- (P-3)(O-9)(22) ( 3 )