B.Tech. - VIEP - ELECTRONICS AND COMMUNICATION ENGINEERING

(BTECVI)

Term-End Examination, 2019

BIEL-013 : ANTENNAS AND PROPAGATION

Time : 3 Hours]   **[Maximum Marks : 70**

Note : Attempt **any seven** questions. **All** questions carry **equal** marks. Use of scientific calculator is permitted. Missing data, if any, may be suitably assumed.

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1. Define an antenna array. Obtain the expression for the beam width of broadside and end-fire array and compare them. [10]

2. Explain the need and confijration of a folded dipole antenna. Sketch its radiation pattern and compare its characteristics with those of a simple half wave dipole. [10]

3. Starting from basic equation of EM field, derive the radiated power and radiation resistance of a current element. [10]

4. (a) Explain the radiation pattern and gain of an antenna. [5]

   (b) Compare the requirements and radiation characteristics of resonant and non-resonant radiators. [5]

5. (a) Explain the working of helical antenna in axial mode. [5]

   (b) What are the secondary antenna ? Give two examples and explain one of these in detail. [5]

6. Write short notes on **any two** of the following :[2×5=10]

   (a) Patch antenna

   (b) Plasma antenna

   (c) Slot antenna

7. (a) Explain the current distribution on a thin wire antenna and its characteristics. [5]

(b)   A transmitting antenna radiates 251 W isotropically. A receiving antenna, located 100 m away from the transmitting antenna, has an effective aperture of 500 cm². Determine the total power received by the antenna.   [5]

8.   (a)   Discuss the effect of earth's curvature on radio wave propagation.   [5]

(b)   Draw a neat sketch of a 3-element Yagi-Uda antenna and explain its principle of operation.[5]

9.   (a)   Define the terms MUF and skip distance in wave propagation.   [5]

(b)   Explain the term 'Wave Tilt' of surface waves.   [5]

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