Code No: RT31045   **R13**   SET - 1

III B. Tech I Semester Supplementary Examinations, May - 2018
ANTENNAS AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) Define radiation intensity, directivity, and solid angle? [3M]
   b) Calculate the directivity of an antenna ,if HPBW on one plane is 30° and 60° on orthogonal plane? [4M]
   c) Define Broadside, end fire and scanned array antennas? [4M]
   d) List out the advantages and limitations of micro strip antennas? [4M]
   e) Calculate the far-field distance between transmitting and test antenna of $Da=2\lambda$. [4M]
   f) If the critical frequency of ionized layer is 2 MHz, find the electron density of the Layer? [3M]

PART -B

2 Explain the terms polar and rectangular radiation patterns, Resolution and effective height? [16M]

3 a) Derive the radiation fields from small electric dipole at far field? [8M]
   b) Explain radiation, induction and electrostatic fields? [8M]

4 a) Calculate and draw the radiation pattern of 2-element array, $d=\lambda/2$, $\alpha_e=0^o$. [8M]
   b) By using pattern multiplication technique, Estimate the radiation pattern of N=3 element, $d=\lambda/2$ of binomial array Antenna? [8M]

5 a) Define axial ratio? Classify the polarization based on axial ratio? [8M]
   b) Estimate the θ_{max}, R_{rad} of a long wire antenna whose length is 5λ? [8M]

6 Explain in detail the function and design of a horn antenna? [16M]

7 a) Derive the field strength equation in a space wave propagation? [8M]
   b) Ex plain wave tilt effect in ground wave propagation? [8M]

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