

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**

PART -A

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|---|----|---|------|
| 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 $D_a=2\lambda$. | [4M] |
| | f) | If the critical frequency of ionized layer is 2 MHz, find the electron density of the Layer? | [3M] |

PART -B

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|---|----|--|-------|
| 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, $d=\lambda/2$, $\alpha_e=0^\circ$. | [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] |

