

III B. Tech I Semester Supplementary Examinations, August - 2021**ANTENNA 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. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A****(14 Marks)**

1. a) Estimate the far field distance from the antenna working at 3 GHz. [2M]
- b) Define radiated power. [2M]
- c) Define Hansen Woodyard condition. [2M]
- d) Draw the structure of microstrip antenna and mention the field distribution. [3M]
- e) Draw the basic Antenna measurement setup. [3M]
- f) Classify the layers exist at day time and night time in Ionospheric layer. [2M]

**PART -B****(56 Marks)**

2. a) Define types of field regions. Estimate all regions of an antenna whose Diameter is  $2\lambda$ . [7M]
- b) Discuss about the various Antenna parameters. [7M]
3. a) Prove that the H-fields radiated by an altering current element is only along  $\Phi$ -direction. [7M]
- b) Find the maximum effective area of an antenna at a frequency of 2 GHz, when the directivity is 100. [7M]
4. a) Obtain the resultant pattern of two short vertical dipole elements placed along  $\phi=0^\circ$  with spacing  $\lambda/2$ . [7M]
- b) Design and explain the working principle of binomial array. List out the differences between binomial array and linear uniform Amplitude distributed antenna. [7M]
5. a) Explain the design procedure of helical antenna at different polarizations. [7M]
- b) How the back lobes are minimized by using travelling wave antenna? Explain different conditions. [7M]
6. a) Classify test sites suitable to measure antenna parameters and explain about any one of the test site. [7M]
- b) Explain the working principle of flat sheet and corner reflector. [7M]
7. a) Find the maximum wavelength at which propagation is possible by means of a ground-based duct 30 m high when  $\Delta M= 30$ . [7M]
- b) An HF radio communication is to be established between two points on the Earth's surface. The points are at a distance of 2600 km. The height of the ionospheric layer is 200 km and critical frequency is 4 MHz. Find MUF. [7M]

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