B. Tech. Sem -VI (E & TC Engg.) (2014 COURSE) (CBCS) :
SUMMER - 2019
SUBJECT: MICROWAVE THEORY AND ANTENNAS

Day: Wednesday
Date: 29/05/2019

Time: 02.30 PM TO 05.30 PM
Max. Marks: 60

S-2019-2780

N.B.

1) All questions are **COMPULSORY.**
2) Figures to right indicate **FULL** marks.
3) Assume suitable data if necessary.

Q.1 A 300 Ohms transmission line is terminated in a load impedance of 100 + j200 Ohms. Calculate the voltage reflection coefficient **(10)**

OR

A transmission line of characteristic impedance 50 ohms is terminated by 100 ohms. Calculate VSWR

Q.2 The wavelength measured in an air filled rectangular waveguide 20 cm * 5cm. Calculate the frequency of the wave .Assume TE_{01} mode and c =3*10^8 m/s. **(10)**

OR

Derive with necessary equations analysis of TE mode in rectangular waveguide.

Q.3 Explain the following with respect to Directional coupler: **(10)**
a)S Matrix b)Coupling factor c)Directivity
d)Two hole directional coupler

OR

Define Gunn Effect? Explain with necessary diagram.

Q.4 An isotropic antenna radiates equally in all directions. The total power radiated to the radiator is 100Kw. Calculate the power density at a distance of **(10)**
a) 100 meters b) 1000 meters c) 10 Km

OR

Calculate the gain of an antenna with circular aperture of diameter 3 meters at a frequency of 5 GHz.

Q.5 Derive the pattern maxima for an array of n isotropic point sources of equal amplitude, phase and spacing. **(10)**

OR

Why log periodic antenna is frequency independent? Explain with necessary equations and diagrams.

Q.6 Define Babinet's principle? Explain with necessary equations and diagrams. **(10)**

OR

Determine the gain, bandwidth and capture area of a parabolic antenna with 10m diameter dish and dipole feed at 10 GHz.

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