P4911

B.E./Insem - 40
B.E. (E & Tc) (Semester - I)
Microwave Engineering
(2012 Pattern)

Time :1Hour]   *[Max. Marks :30*

Instructions to the candidates:-
   1)   Answer Q1 or Q2, Q3 or Q4, Q5 or Q.6.
   2)   Neat diagrams must be drawn wherever necessary.
   3)   Figures to the right side indicate full marks.
   4)   Use of Calculator is allowed.
   5)   Assume Suitable data if necessary.

Q1) a)   An air filled waveguide has dimensions of a = 6 cm and b = 4 cm. The signal frequency is 3 GHz. Compute the following for the TE_{10}, TE_{01}, TE_{11}, TM_{11} modes :   **[8]**
   i)   Cut off frequency
   ii)   Phase Constant
   iii) Group Velocity

   b)   Distinguish between waveguide with transmission line.   **[2]**

<div align="center">OR</div>

Q2) a)   Explain the rectangular cavity resonator in detail.   **[6]**

   b)   Distinguish between TE mode and TM mode.   **[4]**

Q3) a)   Explain the Faraday's rotation principle? Explain in brief the working principle of an isolator.   **[6]**

   b)   Explain the concept of circulator and its construction with the help of Magic Tee and Gyrator.   **[4]**

<div align="center">OR</div>

Q4) a)   Write a short note on Losses in Microstrip line.   **[6]**

   b)   If the incident power of 10 dB directional coupler is 250 mW, calculate **[4]**

   i)   The output power in the main arm

   ii)   The output power in the auxiliary arm

Q5) a) Write a short note on concept as well as different types of impedance.**[6]**

b) Compare circulator and isolator in detail. **[4]**

OR

Q6) a) Discuss the need of network and circuit concepts for microwave analysis.**[6]**

b) Determine the scattering matrix of a 3 port circulator with insertion loss of 0.6 dB, isolation of 30 dB and VSWR of 2. **[4]**

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