Total No. of Questions : 8]

SEAT No. : [ ]

PB2286

[Total No. of Pages : 2

[6263]-124
B.E. (E & TC)
RADIATION AND MICROWAVE THEORY
(2019 Pattern) (Semester - VII) (404181)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q.6, Q. 7 or Q. 8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right carries full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) State the properties of S - matrix and derive S matrix for E plane Tee. **[6]**

b) With neat schematic diagram explain the operation of Gyrator. Also State S - matrix for it. **[6]**

c) A signal of power 40 mW is fed into the collinear ports of lossless H - Plane tee. Determine the powers in the remaining ports when other ports are terminated with matched impedance. **[6]**

OR

Q2) a) Draw and explain two - hole directional coupler with neat diagram. Also state its S - matrix. **[6]**

b) Explain in brief the working principle of an Isolator. **[6]**

c) An Isolator has an insertion loss of 0.5db and an isolation of 30 dB. Determine the Scatting matrix of the isolator if the isolated ports are perfectly matched to the junction. **[6]**

Q3) a) Explain the constrction of single Cavity klystron Tube. **[6]**

b) Explain the Cavity Magnetron with Hull cut off condition in detail. **[6]**

c) What are the limitation of conventional tubes at microwave frequencies? **[6]**

OR

Q4) a) Explain the phase focusing effect in cavity magnetron. **[6]**

b) Explain construction, operation of Two Cavity Klystron. **[6]**

c) Distinguish between TWTA and Klystron Tube. **[6]**

P.T.O.

Q5) a) Explain construction and working of PIN diode. **[6]**

b) Write a short note on IMPATT diode. **[6]**

c) Write the comparison between PN junction diode and Schottky diode. **[5]**

OR

Q6) a) Explain the working principle of Varactor diode. **[6]**

b) Explain construction and working of Schottky barrier diode. **[6]**

c) Explain Gunn effect using two valley theory. **[5]**

Q7) a) Explain the phase shift measurement using double minimum method at microwave frequency. **[6]**

b) Calculate the maximum range of a radar system which 3 cm with a peak pulse power of 600 kW if its antenna is 5 m^2, minimum detectable signal is 10^{-13} W and the radar cross sectional area of the target is 20m^2 **[6]**

c) Write short note on effect of Microwave radiation on human. **[5]**

OR

Q8) a) Write a note on measurement of quality factor. **[6]**

b) Explain reflectometer method for measurement of impedance. **[6]**

c) Differentiate between Satellite and Terrestrial Communication System. **[5]**

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