Total No. of Questions : 8]

SEAT No. :

PF5280

[Total No. of Pages : 2

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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 the Q1 or Q2, Q3 or Q4, Q5 or Q6 and Q7 or Q8.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of Calculator is allowed.***
5) ***Assume suitable data if necessary.***

Q1) a) Draw and explain the principle of operation of isolator. **[6]**

b) Draw and explain working principle of two hole directional coupler with its scattering matrix. **[6]**

c) Draw H plane Tee and explain its working with its scattering matrix. **[6]**

OR

Q2) a) Draw Magic Tee and explain its working with the scattering matrix. **[6]**

b) A 10 dBm directional coupler has a directivity of 40dBm, if the applied input power P1 = 10 mW, then calculate power outputs at port 2, 3 and 4 of a lossless directional coupler. **[6]**

c) Define insertion loss, reflection coefficient and transmission coefficient. **[6]**

Q3) a) State the limitations of conventional tubes and explain how to overcome them in detail. **[6]**

b) Draw and explain the operation of two cavity klystron. **[6]**

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

OR

Q4) a) Draw the construction of single cavity klystron tube and explain its mode characteristics to justify electronic tuning and cavity resonance. **[6]**

b) Draw the construction and explain the working of Magnetron. **[6]**

c) A reflex klystron operates at the peak mode of n=2 with beam voltage V_0 = 300V and beam current I_0 = 20mA. If rf signal voltage V1 = 40 V, then determine the input power, output power and efficiency. **[6]**

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Q5) a) Draw the construction and explain Gunn diode with V-I characteristics and state its application. **[6]**

b) Draw the construction and explain working of TRAPATT diode and state its application. **[6]**

c) Draw the construction and explain working of Varactor Diode and state its application. **[5]**

OR

Q6) a) Compare IMPATT, TRAPATT and BARITT diode with respect to its operating frequency, working principle, and efficiency. **[6]**

b) Explain construction and working principle of tunnel diode with its VI characteristics. **[6]**

c) Explain the construction, working principle and application of PIN diode as a modulator. **[5]**

Q7) a) Explain any two applications of microwaves in detail. **[5]**

b) Explain impedance measurement using slotted transmission line. **[6]**

c) Explain the experimental set up to measure SWR and wavelength using slotted transmission line. **[6]**

OR

Q8) a) Explain any three health hazards due to radiations in details. **[6]**

b) Explain attenuation measurement using power ratio measurement technique. State drawback of power ratio measurement technique. **[5]**

c) Define SAR, PEL and PET. **[6]**

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