

7

**QP Code : 29920**

**(3 Hours)**

**[ Total Marks : 100**

- N.B. :** (1) Question No.1 is compulsory.  
(2) Answer any **four** out of remaining **six** questions.  
(3) Illustrate answers with sketches.  
(4) Use of smith chart is compulsory.

1. (a) Explain amplification process in TWT. **5**  
(b) Differentiate between waveguides and transmission lines. **5**  
(c) With a neat diagram explain the working of a PIN diode. **5**  
(d) List out different characteristics of microwaves. **5**
2. (a) Mention different types of electron flow. Explain Brillouin flow and derive an expression for Brillouin magnetic field  $B_r$ . **10**  
(b) Describe operation of O-type and M-type devices in brief. **10**
3. (a) Describe the mechanism of velocity modulation in a two cavity klystron and hence obtain an expression for the bunched beam current. Also find out condition for maximum power output. **10**  
(b) Explain the procedure of measurement of dielectric constant at microwave frequency. **10**
4. (a) What are the steps to solve a double stub matching problem? **10**  
(b) Using the multiple reflection viewpoint explain the principle of working of a quarter wave transformer. **10**
5. (a) Describe different modes of oscillation of Gunn Diode. **10**  
(b) Explain the working of a negative resistance parametric amplifier. **10**
6. (a) With neat diagrams explain the working of a Gunn Diode. **10**  
(b) Explain the working of magic Tee. Design a circulator using Magic Tees. **10**
7. Write short notes on the following:  
(a) Hybrid junctions **5**  
(b) Power dividers **5**  
(c) Microwave filters **5**  
(d) Compare klystron with magnetron. **5**

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