

M.Sc. 3rd Semester Examination, 2021

PHYSICS

Course Title : Advanced Electronics-I

Course Code : 303ME(A)

Course ID : 32453

Time: 2 Hour

Full Marks: 40

The figures in the right hand side margin indicate full marks.

Candidates are requested to give their answers in their own words as far as practicable.

1. Answer *any five* of the following questions: 2x5=10
 - a) State the microwave frequency range?
 - b) What is the need of 'slow wave structure' in TWT?
 - c) What is 'lead inductance'?
 - d) Draw the block diagram of a two cavity klystron?
 - e) Write the full form of IMPATT.
 - f) What is the use of Smith Chart?
 - g) What do you mean by the modes of laser oscillator?

2. Answer *any four* of the following questions: 5x4=20
 - a) Find the number of modes of resonant cavity per unit volume and hence explain the need of open resonator. 4+1=5
 - b) Briefly explain the limitations of conventional vacuum devices in micro-wave region?
 - c) Explain the process of electron bunching in two cavity Klystron.
 - d) Write the principle of operation of Photodiode. Explain its characteristic current vs voltage graph for various intensities. Define dark current. 2+2+1=5

- e) Derive two transmission line equations?
- f) Draw a simple diagram of reflex klystron and explain its principle of operation briefly.

3. Answer *any one* of the following questions: 10x1=10

- a) Draw the schematic diagram of a IMPATT diode and explain its principle of operation. How 180° phase shift is achieved between input voltage and output current? 2+5+3=10

- b) Write down two difference between TWT and klystron. Drawing the block diagram of TWT explain the principle of amplification of microwave in this device.

2+(3+5)=10
