Roll No. .....

72604

M.Sc. Physics 1st Sem. Examination–December, 2014

Electronic Devices

Paper : IV

Time : 3 hours ***Max. Marks : 80***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt **five** questions in all, selecting **one** question from each Unit. Q. No. 1 is **compulsory**.

1. (a) How are FETs superior to BJTs ? 4

(b) Compare voltage division and current division in circuits. 4

(c) What is the role of negative resistance in switching action in electronic circuits ? 4

(d) Why does a zener diode provide voltage stabilization ? 4

UNIT – I

2. (a) Describe various transistor operating modes and configurations. 8

(b) Describe Ebers-Moll model to find out equivalent circuit of a BJT. 8

3. (a) Explain the pinch-off condition obtained in an FET with the help of a diagram. 8

(b) Describe MOSFET characteristics in different modes. 8

UNIT – II

4. (a) What are ICs ? How are they classified ? Describe various advantages and disadvantages of ICs over discrete elements. 8

(b) How is the isolation obtained in various components during the fabrication of ICs ? 4

(c) How is an IC amplifier different from a conventional amplifier ? 4

5. Describe various processes involved in the fabrication of ICs. Give importance of each step. 16

UNIT – III

6. Describe : 16

(a) Zener diode

(b) Photodiode

(c) Light Emitting diode

(d) Solar cell

7. (a) Differentiate between spatial and temporal coherence in LASER 4

(b) Describe a semiconductor LASER. 4

(c) Describe RAM and ROM. 4

(d) What do you mean by Piezo-electric effect ? How is it used in electronic circuits ? 4

UNIT – IV

8. (a) What do you mean by UJT ? Describe its construction, working and characteristics. 10

(b) Explain rate-effect and various circuits to reduce eliminate it. 6

9. (a) What do you mean by NR devices ? Describe tunnel diode. 10

(b) Compare back diode with a tunnel diode. 6