

SCHOOL OF SCIENCES



UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)
उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)

M.Sc. Physics (MSCPHY12)

First Year Assignment

Last Date of Submission: 15 May 2014

Course Title: Semiconductor Devices Analog and
Digital electronics

Course Code: PHY-504

Year : 2013-14

Maximum Marks :40

Section A

Section 'A' contains 08 short answer type questions of 5 marks each. Students are required to answer 4 questions only. Answers of short answer type questions should be in 250 words approximately.

- 1- Describe the diode current equation. The reverse saturation current of silicon PN junction diode is $10\mu\text{A}$. Calculate the diode current for the forward-bias voltage for 0.6 V at 25°C .
- 2- Describe the construction, working and applications of varactor diode.
- 3- What are multi-stage amplifiers? Explain the terms negative feedback in amplifier.
- 4- Draw the circuit diagram of Hartley oscillator and explain its working. Derive the expressions of frequency of oscillator and condition for starting of oscillator.
- 5- Describe operational amplifier as a multivibrator.
- 6- Explain Karnaugh map.
- 7- Design a full adder circuit using NAND gates and explain truth table.
- 8- What is a flip flop? Explain D flip flop and Master Slave JK flip flop.

Section B

Section 'B' contain 04 long answers type question of 10 marks each and students are required to answers 02 questions only.

- 1- What are methods of transistor biasing?

- 2- Explain the operation of Parallel in- Serial out shift register.
- 3- Explain with neat circuit diagrams the working of sine wave, square wave and triangular wave generator by using operational amplifier.
- 4- Describe Multiplexer and Demultiplexers.