

Reg. No. :

Name :

First Semester M.Sc. Degree Examination, August 2021

Physics

PH 213 : BASIC ELECTRONICS

(2020 Admission)

Time : 3 Hours

Max. Marks : 75

PART – A

Answer any **five** questions. **Each** question carries **3** marks.

- I. (a) Explain basic principles of GUNN diode.
- (b) Discuss with diagram, the characteristics of ideal Bode plot.
- (c) What do you mean by frequency response of an OPAMP?
- (d) Write a short note on demultiplexer.
- (e) Explain glitches in synchronous counter.
- (f) Discuss SIPO register.
- (g) What do you mean by group delay?
- (h) Write a short note on thermistor.

(5 × 3 = 15 Marks)

PART – B

Answer **all** questions. **Each** question carries **15** marks.

- II. (a) With the help of circuit diagram explain phase locked loop.

OR

- (b) With the help of circuit diagram explain first and second order high pass filter.

P.T.O.



III. (a) Explain (i) SISO register (ii) SIPO and (iii) PISO registers.

OR

(b) Explain (i) Decoder (ii) Demultiplexer and (iii) Seven segment display.

IV (a) Discuss the mode theory of circular wave guide and derive the general wave equation and wave guide equation in step index fiber.

OR

(b) Distinguish active and passive transducers with example and Explain thermoelectric transducers.

(3 × 15 = 45 Marks)

PART – C

Answer any **three** of the following questions. **Each** question carries **5** marks.

- V (a) Explain Wien bridge oscillator with circuit diagram and design it for 1 KHz, if $C = 0.05 \mu F$ and $R_1 = 12 K \Omega$.
- (b) Draw the schematic diagram of second order low pass filter and its frequency response and design it for 1 KHz. Given $C = 0.0047 \mu F$.
- (c) Draw the 4-bit serial input shift register and draw the wave forms to shift the number 0100 into the shift register.
- (d) With logic diagram explain edge triggered D flip flop.
- (e) Determine the normalized frequency at 820 nm for a step index fiber having a $25 \mu m$ core radius, $n_1 = 1.48$ and $n_2 = 1.46$. Also calculate the number of modes in this fiber at 820 nm and 1320 nm.
- (f) Explain pin photo detector and calculate the cut off wave length of GaAs which has a band gap of 1.43 eV at 300K.

(3 × 5 = 15 Marks)

