

This question paper contains 2 printed pages]

**LB—152—2023**

**FACULTY OF SCIENCE**

**M.Sc. (First Year) (First Semester) EXAMINATION**

**APRIL/MAY, 2023**

**(New/CBCS Pattern)**

**PHYSICS**

**Paper-PHY-104**

**(Electronic Devices and Applications)**

**(Tuesday, 9-5-2023)**

**Time : 10.00 a.m. to 1.00 p.m.**

*Time— Three Hours*

*Maximum Marks—75*

*N.B. :— (i) All questions are compulsory.*

*(ii) Figures to the right indicate full marks.*

1. What is UJT ? Explain the construction and characteristics with its equivalent circuit. 15

*Or*

(a) Give classification based on band gap of materials and discuss semiconductors in brief. 8

(b) Explain construction and basic operation of SCR. 7

2. What are photoconductive cells ? Discuss the construction, working and application of phototransistor. 15

*Or*

(a) What is LED ? Explain its construction and working. 8

(b) Explain direct and indirect band gap of semiconductor. 7

**P.T.O.**

3. Draw neat circuit diagrams for op-amp used as an : 15

(a) Inverting amplifier and

(b) Non-inverting amplifier and explain its working in detail.

Or

(a) State applications of op-amp as active filters and explain op-amp as a low pass filter. 8

(b) Discuss in short op-amp parameters. 7

4. Discuss the various number systems and explain with suitable example how to convert binary number into decimal and hexadecimal number system. 15

Or

(a) What do you mean by shift register ? Explain 4-bit left to right shift register. 8

(b) Give symbol, truth table and working for NAND and NOR gate. 7

5. Write short notes on any *three* : 15

(a) *n*-type semiconductor

(b) Photodetector

(c) op-amp as a comparator

(d) J-K flip-flop.