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**NEPNY—86—2023**

**FACULTY OF SCIENCE**

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

**NOVEMBER/DECEMBER, 2023**

**PHYSICS**

**Paper—SPHYE—401**

**(Electronic Devices)**

**(Thursday, 28-12-2023)**

**Time : 10.00 a.m. to 12.30 p.m.**

*Time—2½ Hours*

*Maximum Marks—60*

**N.B. :—** (i) All questions carry equal marks.

(ii) Question No. 1 is compulsory.

(iii) Solve any *three* of the remaining five questions (Q. No. 2 to Q. No. 6)

(iv) Figures to the right indicate full marks.

1. Solve the following questions (Each question 5 marks) : 15

(a) Explain construction of npn & pnp transistor.

(b) Explain in brief IV characteristics of solar cell.

(c) With logic diagram and truth table explain J-K flip-flop.

P.T.O.

2. (a) What is SCR ? Explain its structure and characteristics. 8
- (b) Draw the structure of PN junction diode and explain its IV characteristics. 7
3. (a) Discuss construction and working of phototransistor. 8
- (b) What are photoconductive cell ? Explain its working in brief. 7
4. (a) Draw the circuit diagram for op-amp used as subtractor. Explain its working and derive equation for output voltage. 8
- (b) With neat circuit diagram explain op-amp as comparator. 7
5. (a) Define counters and explain in brief 2-bit asynchronous counter. 8
- (b) With logic symbol and truth table, discuss NAND and NOR gates. 7
6. Write short notes on (Each question 5 marks) : 15
- (a) Extrinsic semiconductor
- (b) LED
- (c) T and D-type flip-flop.