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NY—160—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(New/CBCS Pattern)

PHYSICS

PHY-104

(Electronic Devices and Applications)

(Saturday, 9-12-2023)

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

Time—3 Hours

Maximum Marks—75

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

(ii) Figures to the right indicate full marks.

1. What is SCR ? Explain construction and characteristics for it. 15

Or

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

(b) What is BJT ? Explain working of NPN transistor in FR bias. 7

2. Explain in detail the construction, working principle and I-V characteristics of solar cell. 15

Or

(a) Explain construction and working of light emitting Diode. 8

(b) Explain the construction and working of photodiode. 7

P.T.O.

3. With a neat circuit diagram, explain op-amp as an integrator and differentiator.

15

Or

(a) Explain construction and working of op-amp as a non-inverting amplifier.

8

(b) State ideal characteristics of op-amp.

7

4. What is flip-flop ? Discuss symbol, working and truth table of J-K, T and D-type flip-flop.

15

Or

(a) What do you mean by multiplexer ? With logic diagram and truth table explain 4 : 1 multiplexer.

8

(b) With logic symbol and truth table explain basic logic gates.

7

5. Write short notes on any *three* :

15

(a) p-type semiconductor

(b) Direct and indirect band gap of semiconductor

(c) Op-amp as a comparator

(d) Shift register.