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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 transister 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.