PG/IIS/PHS/207/25

M.Sc. 2nd Semester Examination, 2025

PHYSICS

(*Digital Electronics*)

PAPER – PHS-207

Full Marks : 25

Time : 1 hour

Answer all questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

1. Answer any *two* questions : 2 × 2

   (*a*) What is the data writing process of a compact disk memory ?

(*b*) Differentiate machine language, opcode and mnemonics.

(*c*) Draw a circuit which can add or subtract two 2-bit binary numbers.

(*d*) In a 6-bit DAC the full swing is 0V to 21V. What will be the output voltage for the input 100001 ? What is the resolution of the DAC ?

GROUP – B

2. Answer any *two* questions : 4×2

(*a*) (*i*) Design 8:1 multiplexer to get the output waveform 10010010.

(*ii*) What is the difference between SRAM and DRAM ? 2 + 2

(*b*) (*i*) Give the schematic of A.L.U. and explain the function of it.

(*ii*) Consider a 2-bit carry look ahead adder. Draw the circuit to generate the carry C_2. 2 + 2

(*c*) (*i*) Give the result of the following execution; $(2B)_H$ ExOR $(C1)_H$ and $(2B)_H$ NAND $(C1)_H$.

(*ii*) Give the digital circuit of 2-bit multiplier. 2 + 2

(*d*) (*i*) What are the different FLAG registers in 8085 microprocessor ?

(*ii*) Give the role of different registers in 8085 microprocessor ? 2 + 2

GROUP – C

3. Answer any *one* question : 8 × 1

(*a*) (*i*) Draw the circuit to expand 16×4 memory IC to 32 × 8 memory cell.

(*ii*) Give the circuit diagram of a BCD Adder. 4 + 4

(*b*) (*i*) Schematically construct a 4-bit ADC and explain the function briefly.

(*ii*) Solve the digital equation $Y = \Sigma(2,3,7)$ using 8:1 Multiplexer. 4 + 4

[Internal Assessment — 5 Marks]
