

Roll No. :

Total No. of Questions : 11]

[Total No. of Printed Pages : 3

BFMS-457

M.Sc. (Final) Examination, 2023

PHYSICS

Paper - VII (B)

(Analog, Digital Systems and Communications)

Time : 3 Hours]

[Maximum Marks : 75

Section-A

(Marks : 2 × 10 = 20)

Note :- Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

Section-B

(Marks : 5 × 5 = 25)

Note :- Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **5** marks.

Section-C

(Marks : 10 × 3 = 30)

Note :- Answer any *three* questions out of five (Answer limit **500** words). Each question carries **10** marks.

Section-A

1. Attempt all questions :

- (i) Draw circuit diagram of a pulse generator.
- (ii) Write one application of ROM and RAM.

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- (iii) Write the major difference between external photo effect and internal photo effect in photo detectors.
- (iv) What is the working principle of Diode Tester ?
- (v) What is the application of Photo Transistor ?
- (vi) What are DSBSC waves ?
- (vii) Write one use of Multiplexer.
- (viii) What are cascade counters ? Define shortly.
- (ix) What is the basic application of Micro-computers ?
- (x) What is the meaning of Indexing ?

Section-B

2. Draw the circuit diagram of a comparator and explain its working principle.

Or

Explain ROM and RAM then compare ROM and RAM.

3. Explain junction photo detectors and write application.

Or

Explain working of an LED and application in a measuring instrument.

4. Write short notes on the following :

- (i) Semiconductor Switches
- (ii) Potential Isolation

Or

Explain generation and detection of SSB waves.

5. Draw the logic circuit and obtain the truth table of the following expression :

$$Y = \bar{A}B + A\bar{B} + \bar{A}\bar{B}$$

Or

Write the difference and working of synchronous and asynchronous counters.

6. What is the Address Bus ? Explain.

Or

Explain briefly the following :

- (i) Instruction Set
- (ii) Addressing Modes

Section–C

- 7. Write and explain the working of Digital to analog converts with proper diagrams.
- 8. Explain photo counters and photo resistors with applications.
- 9. What is Amplitude Modulation ? Explain DSBSC modulation.
- 10. Write short notes on working with diagrams :
 - (i) RS flip-flop
 - (ii) JK flip-flop
 - (iii) T flip-flop
 - (iv) D flip-flop
- 11. Explain the process of demultiplexing the address bus generating control signals.