

Bs/PHYM-201

2025

(FYUGP)

(2nd Semester)

PHYSICS

(MINOR)



Paper : PHYM-201

(**Digital Systems and Applications**)

Full Marks : 75

Pass Marks : 40%

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

Answer **five** question, taking **one** from each Group

GROUP—A

1. (a) With the help of block diagram, explain the working of CRO. 6
- (b) Write a note on classification of ICs. 4

L25/399a

(Turn Over)

2. (a) Obtain the truth table of NAND and NOR gate. 3+3=6
 (b) Convert the following : 2×2=4
 (i) 49 to binary number
 (ii) (10101100) to decimal number

GROUP—B

3. (a) State and prove Boolean laws. 4
 (b) Describe the function of a 1:4 demultiplexer. 6
 4. (a) Discuss full subtractor with circuit diagram. 5
 (b) Find the 1's complement and 2's complement of (10101). 5

GROUP—C

5. (a) Explain a clocked R-S flip-flop with circuit diagram. 6
 (b) Write a short note on race around conditions. 4
 6. (a) Write a note on master-slave J-K flip-flop. 5
 (b) Draw a block diagram of IC555. 5

GROUP—D

7. (a) Explain the operation of SISO register with circuit diagram. 6
 (b) Give some applications of 3-byte instructions. 4
 8. (a) Discuss the working of decade counter. 5
 (b) Describe the circuit and function of asynchronous counter. 5

GROUP—E

9. (a) Give an account of input/output devices of a computer. 6
 (b) Write a note on address space partitioning and address decoding. 4
 10. (a) Classify the various addressing modes of 8085. 5
 (b) What are the various types of interrupts in 8085? Explain them. 5

★★★

Subject Code : Bs/PHYM-201

To be filled in by the Candidate

BA / BSc / BCom / BBA / BCA
2nd Semester End Term
Examination, **2025 (FYUGP)**

Subject

Paper

INSTRUCTIONS TO CANDIDATES

1. The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.
2. This paper should be **ANSWERED FIRST** and submitted within **1 (one) Hour** of the commencement of the Examination.
3. While answering the questions of this booklet, any cutting, erasing, over-writing or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.

Signature of
Scrutiniser(s)

Signature of
Examiner(s)

Booklet No. A 40

Date Stamp

.....

**To be filled in by the
Candidate**

BA / BSc / BCom / BBA / BCA
2nd Semester End Term
Examination, **2025 (FYUGP)**

Roll No.

Regn. No.

Subject

Paper

DESCRIPTIVE TYPE

Booklet No. B

Signature of
Invigilator(s)

2025

(FYUGP)

(2nd Semester)

PHYSICS

(MINOR)

Paper : PHYM-201

(Digital Systems and Applications)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

Put a Tick (✓) mark against the correct answer in the
brackets provided : 1×15=15

1. Which component of CRO is referred to as 'heart' of CRO?

- (a) Time-base generator ()
- (b) Cathode-ray tube ()
- (c) Triggering circuit ()
- (d) Deflection plates ()

(2)

2. The conducting coating on the inside of conical region of cathode-ray tube is called

- (a) graticule ()
- (b) aquadag ()
- (c) astigmatism ()
- (d) grid ()

3. A kilobyte, also referred to as KB, is equal to

- (a) 1000 bytes ()
- (b) 1024 bytes ()
- (c) 2048 bytes ()
- (d) 512 bytes ()

4. According to Boolean law, $A + 1 = ?$

- (a) 1 ()
- (b) A ()
- (c) 0 ()
- (d) A' ()

5. Which of the following methods is used to minimize Boolean expressions?

- (a) Fourier transform ()
- (b) Gray code ()
- (c) Karnaugh mapping ()
- (d) None of the above ()

6. The word 'demultiplex' means

- (a) one into many ()
- (b) many into one ()
- (c) Both of the above ()
- (d) None of the above ()

7. Adding 1001 and 0010 gives an output of

- (a) 1111 ()
- (b) 0000 ()
- (c) 1011 ()
- (d) 1010 ()

8. The flip-flop is only activated by

- (a) positive edge trigger ()
- (b) negative edge trigger ()
- (c) either positive or negative edge trigger ()
- (d) All of the above ()

9. How many states does a decimal counter have?

- (a) 5 ()
- (b) 10 ()
- (c) 15 ()
- (d) 0 ()

10. Johnson counter is also known as

- (a) asynchronous counter ()
- (b) twisted ring counter ()
- (c) decade counter ()
- (d) register ()

11. The parallel outputs of a counter circuit represent

- (a) clock count ()
- (b) clock frequency ()
- (c) clock modulars ()
- (d) synchronous counter ()

12. The process of copying data from a memory location is called

- (a) reading ()
- (b) writing ()
- (c) controlling ()
- (d) booting ()

13. The list of instructions used by a computer is called

(a) program ()

(b) CPU ()

(c) text ()

(d) output ()

14. Which of the following memories is volatile?

(a) RAM ()

(b) ROM ()

(c) EPROM ()

(d) PROM ()

15. Clock speed is also known as

(a) clock rate ()

(b) clock length ()

(c) clock set ()

(d) clock type ()

(7)

SECTION—II

(Marks : 10)

Answer any *five* of the following questions in brief : $2 \times 5 = 10$

1. Why is electron gun called so?

2. What is VLSI?

3. Give the difference between minterms and maxterms.

(10)

4. Give two practical applications of seven-segment display.

5. What do you mean by propagation delay?

6. Why is IC555 timer named 555?

7. What do you mean by universal shift register?

8. How is a ring counter superior to ripple and synchronous counters?

9. What is non-volatile memory?

10. What is meant by a bus?
