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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2023-24 ONLY)

SUBJECT CODE 23UPS6E16

REG.NO.:

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY– 2026

B.Sc. – PHYSICS **MAXIMUM MARKS: 75**

VI SEMESTER **TIME : 3 HOURS**

PART – III

DIGITAL CIRCUIT SYSTEMS & MICROPROCESSOR

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. The largest two digit hexadecimal number is _____
   a. $(FE)_{16}$ b. $(EE)_{16}$ c. $(FF)_{16}$ d. $(EF)_{16}$
2. The logical sum of two or more logical product terms is called _____
   a. SOP b. POS c. OR Operation d. NAND Operation
3. When both inputs of a J-K flip-flop cycle is 1 the output will _____
   a. Invalid b. Change c. No change d. Toggle
4. Change quantized values to binary values
   a. Demultiplexer b. Decoder c. Encoder d. Multiplexer
5. Which of the following flag is used to mask INTR interrupt?
   (a) Zero flag (b) Auxiliary carry flag flag (c) Interrupt flag (d) Sign flag

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6. Any signed negative binary number is recognized by its _____
7. According to Boolean law: A + 1 = ----------
8. There are _____ basic types of flip-flop based on clock trigger.
9. A register can also be used to provide data movements is known as ----------
10. If the Sign Flag is set, the result must be _____

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Find the 1's complement and 2's complement of the binary number 101101

(OR)

b) Convert the following binary numbers to decimal:
   i. 1101_2
   ii. 10110_2

12. a) Apply the concept of overlapping group to explain the karnaugh simplification.

(OR)

b) Explain the following (i) Pairs and (ii) Quads.

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13. a) Explain the working of half Subtractor circuits with suitable truth table.

(OR)

b) Explain the working seven segment decoder circuit.

14. a) Construct circuit of D flip – flop and discuss its working.

(OR)

b) Draw a diagram of JK master slave flip – flop and discuss its working.

15. a) Explain the functions of the following

i) Stack ii) Subroutine

(OR)

b) Classify the instructions in 8085 microprocessors based on its operations. Explain the data transfer instruction with suitable examples.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4 (Or) K5)

16. a) Design logic circuits using NAND gates as universal building blocks.

(OR)

b) Explain the working of AND, OR, and NOT gates. Write their truth tables.

17. a) State De Morgan's Theorems and verify them using truth tables for two variables.

(OR)

b) Convert the Boolean function F (A, B, C) =$\sum$m (1, 3, 5, 7) into SOP form**.**

18. a) Explicate the working of Half and full adders circuits with suitable truth tables.

(OR)

b) Convert the 16 to 1 multiplexer circuit with a neat diagram & explain its operations.

19. a) Describe the basic function of parallel in parallel out shift register.

(OR)

b) Explain the working of the asynchronous mod 8 up and down counter.

20. a) Draw and explain the architecture of the intel 8085 microprocessor.

(OR)

b) Describe the different types of addressing modes in the 8085 microprocessor with examples.

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