Seat No

Set R

S.Y. (B.Tech. Electronics & Computer Engineering) (Sem - I) (New) (NEP CBCS) Examination: October/November – 2025
Fundamentals Of Digital Techniques (ECEPCC-01)

Day & Date: Monday, 15-12-2025 Max. Marks: 70
Time: 03.00 PM To 06.00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct alternative. **14**

1) Which flip-flop is best for FSM design?
a) JK b) D
c) T d) SR

2) PLA consists of _____.
a) Programmable AND, Programmable OR
b) Fixed AND, Programmable OR
c) Programmable AND, Fixed OR
d) Fixed both

3) Ripple counter is also called _____.
a) Asynchronous counter b) Synchronous counter
c) Universal counter d) Ring counter

4) MOD of a counter = _____.
a) 2^n (where n = flip-flops) b) $n/2$
c) n^2 d) $1/n$

5) Which gate outputs 0 only when both inputs are equal?
a) XOR b) XNOR
c) NAND d) NOR

6) $(1110)_2 - (1001)_2 = ?$
a) 0101 b) 0111
c) 0011 d) 1011

7) A Boolean function expressed as a sum of minterms is called _____.
a) Canonical POS b) Canonical SOP
c) Standard equation d) Minimal expression

8) Boolean function $F(A,B,C) = \Sigma m(1,3,5,7)$ is _____.
   a) $A'B'C$ b) $A'C + AC$
   c) $B + C$ d) $A \oplus C$

9) Borrow output in half subtractor is _____.
   a) $A'B$ b) AB'
   c) $A \oplus B$ d) $A + B$

10) SR flip-flop is also called _____.
   a) Latch b) Register
   c) Counter d) Buffer

11) The difference between combinational and sequential circuits is the use of _____.
   a) Gates b) Feedback
   c) Power supply d) Multiplexers

12) A counter is a _____.
   a) Combinational circuit b) Sequential circuit
   c) Analog circuit d) None

13) Characteristic equation of T flip-flop is _____.
   a) $Q(\text{next}) = D$ b) $Q(\text{next}) = T \oplus Q$
   c) $Q(\text{next}) = JQ' + K'Q$ d) $Q(\text{next}) = SR'$

14) A self-loop in a state diagram means _____.
   a) Reset b) Transition to next state
   c) Undefined state d) Stay in same state

Seat No. 129781

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Fundamentals Of Digital Techniques (ECEPCC-01)

Day & Date: Monday, 15-12-2025 Max. Marks: 56

Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) Convert the following decimal numbers to binary and octal:
i) 45
ii) 113

b) Explain Full Adder with suitable diagram.

c) What is a demultiplexer? Draw and explain a 1:4 demultiplexer.

d) Explain the working of an SR flip-flop with its truth table.

e) What are shift registers? Explain different types with diagrams.

Q.3 Attempt the following. (Any Two) **12**

a) Using a Karnaugh Map, simplify the function
$F(A,B,C,D) = \sum(1,3,7,11,15)$

b) Simplify the Boolean expression using Boolean laws:
i) $A + AB + A'B$
ii) $ABC' + BC + A'C$

c) Explain the operation and characteristic table of SR, JK, D, and T flip-flops.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) Draw a state diagram and state table for a sequence detector that detects "101" in a serial bit stream.

b) Describe the programming technique of EEPROM and how it differs from PROM.

c) Compare RAM, ROM based on volatility, working stage, storage capacity and use.

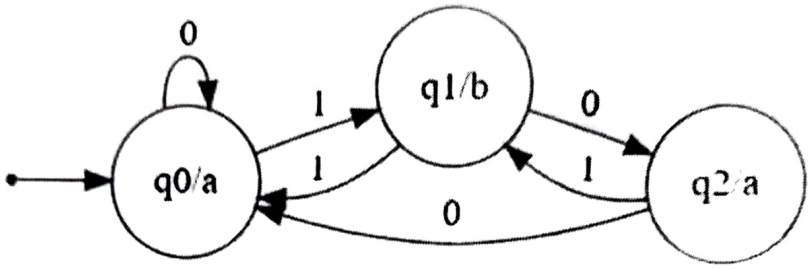
d) Differentiate between Moore and Mealy machines with examples.

e) What are Programmable Logic Devices (PLDs)? List their types.

12

Q.5 Attempt the following. (Any Two)

a) Convert the following Moore machine to the Mealy machine with transition table.



b) Compare PROM, PAL, and PLA based on structure and functionality.

c) Describe the working of a Digital to Analog Converter (DAC) with a circuit diagram.