

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: CSE/EEE**

**SEMESTER : IV
SESSION : SP/2025**

SUBJECT: EC261 DIGITAL COMPUTER ELECTRONICS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Digital system has a 4-bit input from 0000 to 1111. Design a logic circuit using only NAND gates that produce a HIGH output whenever the equivalent decimal input is greater than 4.	[5] 1	3
Q.1(b)	Develop a 4-to-2 priority encoder which has highest priority for highest order input.	[5] 1	2
Q.2(a)	State the difference between excitation table and characteristics table. Construct JK flip flop with NAND gates and obtain its characteristics equations.	[5] 2	1
Q.2(b)	Explain the differences between registers and counters. Design 4-bit ring counter using D flip flops.	[5] 2	3
Q.3(a)	Compare and contrast ROM and PROM. Implement Full Adder expression using PROM.	[5] 3	3
Q.3(b)	Draw and explain the schematic diagram of a RAM chip. Design 16x8 memory using 16x4 memory RAM chips.	[5] 3	1
Q.4(a)	Draw the architecture of SAP-1 computer and explain the function of each block in the left-hand side.	[5] 4	2
Q.4(b)	Differentiate between Opcode fetch cycle and Execution Cycle. Draw the timing diagram for opcode fetch cycle.	[5] 4	1
Q.5(a)	List and explain the main component of a Data Acquisition system. What are the types of sensors used in data acquisition system?	[5] 5	1
Q.5(b)	Explain the difference between Microprocessor and Microcontroller. What are the advantages of using microcontroller in data logging system?	[5] 5	1

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