

K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-22

(Autonomous College Affiliated to University of Mumbai)

End Semester Exam

Nov – Dec 2021

Program: (B. Tech) Artificial Intelligence and Data Science

Examination: SY Semester: III

Course Code: 1UAIC304 and Course Name: Digital Logic and Computer Architecture

Duration: 03 Hours

Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	What is Binary equivalent of given decimal number $(56.125)_{10}$	02	CO1	U
ii)	Perform BCD subtraction of given number using 2's complement method. $(83)_{10} - (21)_{10}$	02	CO2	Ap
iii)	Write D flip-flop truth table and its characteristics equation.	02	CO3	U
iv)	What is CISC.	02	CO4	R
v)	Define Locality of reference	02	CO5	R

vi)	Define Data hazards and list it's types?	02	CO6	R
vii)	Draw 4:1 Multiplexer gate level diagram.	02	CO3	U
viii)	Write Double precision floating point number format.	02	CO2	R
Q.2	Solve any four questions out of six.	16		
i)	Implement AND gate using NOR gates only.	04	CO1	Ap
ii)	Convert $(2A3B)_{16}$ in IEEE 754 single precision floating point representation.	04	CO2	Ap
iii)	Implement Full adder using Half adder circuit.	04	CO3	Ap
iv)	Write micro-operation for instruction MOV R2, [4000H].	04	CO4	U
v)	A block set associative cache consists of 64 blocks divided in 4 block set. The main memory contains 4096 blocks, each 128 words of 16-bit length. What is size of main memory and number of address lines.	04	CO5	Ap
vi)	If a processor executes 100 instructions in a pipelined (5 stage) processor and unpipelined processor. What is the speedup achieved by pipelining technique if the time taken for each stage is 20ns?	04	CO6	Ap
Q.3	Solve any two questions out of three.	16		
i)	State type codes and show with examples steps to convert Binary to Gray and Gray to Binary.	08	CO1	U
ii)	Explain hardwired control units and its types.	08	CO4	U
iii)	State Cache Mapping Techniques and explain one technique in detail.	08	CO5	U
Q.4	Solve any two questions out of three.	16		

i)	Perform $(-11 \times 13)_{10}$ using Booth's Multiplication Algorithm.	08	CO2	Ap
ii)	Explain Addressing modes with examples	08	CO3	U
iii)	Explain Flynn's Classification	08	CO6	U