K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Jan/Feb ~~Nov – Dec~~ 2025
(B. Tech) Program: Information Technology_Scheme :III
Supplementary ~~Regular~~ Examination: SY Semester: III
Course Code: ITC304 and Course Name: Computer Organization and Architecture
Date of Exam: ~~29/11/2025~~ 03/02/26 Duration: 02.5 Hours Max. Marks: 60

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

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any **two** questions out of three: (05 marks each)	10		
a)	Explain the difference between Soft wired and Hardwired Control units.		CO2	U
b)	Convert the following: i) $(3A.F4)_{16}$ to Octal. ii) $(345)_{10}$ to Binary and Hexadecimal.		CO3	A
c)	Implement an embedded C program for 8051 to transfer the letter "A" serially at 9600 baud continuously.		CO6	A
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Compute the IEEE 754 single-precision and double-precision floating-point representations for the decimal value $(105)_{10}$.		CO3	A
b)	Explain ROM memory and its types PROM, EPROM, and EEPROM.		CO4	U
c)	Explain difference between Microcontroller and Microprocessor.		CO6	U
Q.3	Solve any **two** questions out of three. (10 marks each)	20		
a)	Explain the Instruction Cycle in detail with a neatly labeled state diagram and describe each phase of the cycle, such as Fetch, Decode, Execute, Memory Access, and Write-Back.		CO2	U
b)	i)Explain the working of DMA with a diagram.(5M) ii)Explain the difference between Programmed and Interrupt-driven I/O data transfer techniques(5M)		CO5	U

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c)	Draw and explain the Architecture of the 8086 microprocessor in detail.		CO1	U
Q.4	Solve any **two** questions out of three. (10 marks each)	20		
a)	Explain the Direct Memory Mapping technique in cache memory in detail. Draw and explain a 3-level cache memory diagram and describe it's working.		CO4	U
b)	Multiply (-7) and (4) using Booth's Algorithm and draw and explain the flowchart for Booth's algorithm		CO3	A
c)	Draw the pin diagram of the 8051 microcontroller and explain the function of each pin in detail.		CO6	U

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