JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

B.Tech.-V Semester (ECE)

COURSE CODE (CREDITS): 18B11EC512 MAX. MARKS: 35

COURSE NAME: Microprocessor and Interfacing

COURSE INSTRUCTORS: Dr. Shweta Pandit MAX. TIME: 2 Hours

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required

for solving problems

Q.No	Question	CO	Marks
Q1	Describe the functions of different sections of the 8284A clock generator and explain its output signals at appropriate pins by examining their relationship with input frequency. Also interpret the reason for different frequency signals generated at different output pins for a single frequency crystal oscillator input.	1	5
Q2	a) What is Direct Memory Access (DMA) mode of operation? Compare the DMA mode with the interrupt mode in terms of their priority and execution sequence during an instruction cycle. b) Which microprocessor pins are utilized for the DMA and interrupt requests and acknowledgments.	4	2+1 1
Q3	Design an input-output system for interfacing a hexadecimal keyboard with an 8086 microprocessor. The system should be able to detect key presses and decode them using a matrix circuit (row-column scanning method).	3	6
Q4	Design and implement a system to interface an LED with the 8086 microprocessor. The LED should blink at a rate of 1000 microseconds. As part of the design, you must explain the hardware connections required to interface the LED with the 8086 microprocessor via the 8255 PPI. Develop the assembly program for the 8086 to toggle the LED state, including a subroutine to achieve the 1000-microsecond delay and justify the choice of delay calculation and its alignment with the microprocessor's clock frequency. Also illustrate the flow of data and control signals between the 8086, 8255 PPI, and the LED.	3	7
Q5	Design an assembly language program using INT 21H to display the string "Hello World" stored at memory location 1000:1000. Explain the role of INT 21H and assess how many different functions it supports. Also demonstrate how the program distinguishes between displaying a string and taking a single-digit input with echo into the BL register using same INT 21H software interrupt call. Evaluate the difference in the function calls for reading input and displaying output, and justify how INT 21H differentiates these operations.	4	6

Q6	a) Explain the key features and applications of MMX and SIMD technologies, and analyze their impact on processing performance.	5	2
	b) Evaluate the role of the 8087 arithmetic coprocessor in enhancing computational efficiency		1
Q7	Describe the superscalar architecture and branch prediction logic of Intel Pentium processor which was missing in earlier generation processors.	5	4