P P SAVANI UNIVERSITY

Forth Semester of B. Tech. Examination

November- December 2021

SECE2040 Computer Organization

07.012.2021, Tuesday **Time: 12:30 p.m. To 03:00 p.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	Answer the following. (Any Five)	**[05]**
(i)	Convert 100101 binary number in to gray code.	
(ii)	ADD is _____ type of instruction.	
(iii)	Define : micro operation	
(iv)	Effective address= _____ + _____	
(v)	Define: Interrupt	
(vi)	_____ table is generated at the end of first pass of an assembler.	
Q - 2 (a)	Draw block diagram of Control unit of basic computer and explain it.	**[05]**
Q - 2 (b)	Write assembly language program to Add two Double-Precision Numbers.	**[05]**
	OR	
Q - 2 (a)	What is instruction cycle? Draw Flowchart for Instruction cycle and explain it	**[05]**
Q - 2 (b)	Write assembly language program to Subtract two numbers.	**[05]**
Q - 3 (a)	Assume A = (+8) and B = (+5). Multiply these two numbers using Booth algorithm. Show the step-by-step multiplication process.	**[05]**
Q - 3 (b)	Write a program to evaluate the following arithmetic statement X= [A * (B + C) –D] / (E + F -G) (i) using a general register computer with three-address instructions, (ii) using an accumulator type computer with one-address instructions, (iii) Using a stack organized computer with zero-address operation instructions.	**[05]**
	OR	
Q - 3 (a)	Show the contents of registers E, A, Q and SC during the process of division of following binary numbers. (Use dividend of eight bits). a. 10100011 by 1011 b. 00001111 by 0011	**[05]**
Q - 3 (b)	What is meant by addressing modes? How addressing mode is significant for referring memory? List and explain types of addressing modes with example.	**[05]**
Q - 4	Attempt any one.	**[05]**
(i)	What is Interrupt? List and explain types of interrupt.	
(ii)	Explain the difference between hardwired control and micro programmed control. Is it possible to have a hardwired control associated with a control memory?	

SECTION – II

Q - 1	Answer the following. (Any Five)	**[05]**
(i)	List out four peripheral devices that produce an acceptable output for a person to understand.	
(ii)	How many 128 × 8 RAM chips are needed to provide memory capacity of 2048 bytes?	
(iii)	Define: Cache Memory	

(iv)	Define: Pipelining	
(v)	How many switch points are there in a cross bar switch network that connects p processors to m memory modules?	
(vi)	Define : Logical address	
Q - 2 (a)	Explain with example: Associative mapping, Direct mapping, and Set- Associative mapping.	[05]
Q - 2 (b)	Explain vector operation.	[05]
	OR	
Q - 2 (a)	Draw a neat diagram of memory hierarchy of computer system. Also indicate relative variation of size, speed and cost per bit in the hierarchy.	[05]
Q - 2 (b)	Explain Characteristics of Multiprocessors.	[05]
Q - 3 (a)	Explain pipelining technique. Draw the general structure of four segment pipeline.	[05]
Q - 3 (b)	What is asynchronous data transfer? Draw the block diagram, timing diagram and sequence of event for the source-initiated transfer using handshaking method.	[05]
	OR	
Q - 3 (a)	Differentiate between CISC and RISC.	[05]
Q - 3 (b)	What is the difference between isolated I/O and memory mapped I/O?	[05]
Q - 4	Attempt any one.	[05]
(i)	Explain DMA (Direct Memory Access) controller with block diagram.	
(ii)	What is parallel processing? How Flynn's classification divides computers into four major components?	

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