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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Computer System Architecture   **Semester:** 3rd

Program: B. Tech Computer Science (Cyber Law/ET-IPR)

Time : 03 hrs.

Course Code: CSEG 2002   **Max. Marks:** 100

Instructions: All questions of section A are compulsory. Question number 9 (Section B) and 11 (Section C) have internal choice.

SECTION A

S. No.		Marks	CO
Q 1.	What does Moore's law state? Write down the technologies used in the hardware of different generations of computers.	2+2	CO1
Q 2.	Explain the Von Neumann's architecture with schematic diagram.	4	CO1
Q 3.	Write down the excitation table of JK flip flop.	4	CO1
Q 4.	Explain in brief, the idea of superscalar processing.	4	CO3
Q 5.	Draw the circuit diagram and Truth table for Full adder.	4	CO2

SECTION B

Q 6.	Describe with the help of flow chart, how to figure out if the control is in instruction cycle or interrupt cycle.	10	CO2
Q 7.	With the help of necessary diagram, show the CPU register organization of a basic computer that has 4Kof main memory and 16 bit shared bus. Give necessary explanations, where necessary.	10	CO3
Q 8.	Give the relative pros and cons of program controlled I/O and interrupt controlled I/O. What are the different types of interrupts?	6+4	CO2, CO4
Q 9.	What is bus arbitration? Explain with clarity, the process of bus arbitration. OR b) List and explain the steps involved in the execution of a complete instruction along with flow chart.	8+2 10	CO4 CO3

SECTION-C			
Q 10.	(a) Design 4-bit adder/Subtractor (with carry) and explain its function. (b) Describe with necessary diagram the working of interrupt controlled I/O.	**10+10**	**CO1, CO3**

Q 11.	(a) What are micro operations? Write down the micro operations involved for the following instructions along with respective timing intervals:
	   (i) BUN
	   (ii) STA
	   (iii) AND
	(b) Explain the working principle of virtual memory.
	
	 OR
	
	(c) Discuss about set-associative mapping.
	(d) Discuss the functions of the 3x8 and 4x16 decoders used in the control unit of a basic computer.
	(e) Give the truth table and excitation table of a T flip flop.
		[2+ (3x4)] +6
		
		[8+(5+ 5)+2]
			CO2, CO4
			
			CO4, CO3, CO1