3RD SEM CSE/IT 2020(W) NEW

TH1- Computer System Architecture

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1.		Answer **All** questions	2 x 10
	a.	What is Virtual Memory.	
	b.	Define throughput of a system.	
	c.	Define USB.	
	d.	Define SCSI.	
	e.	What do you mean by opcode and operand in an instruction.	
	f.	What is the principle of locality.	
	g.	What is clock cycle.	
	h.	Define subroutine.	
	i.	Define macro.	
	j.	Define hit rate.	
2.		Answer **Any Six** Questions	5 x 6
	a.	Define instruction format. Explain different instruction formats.	
	b.	Explain the instruction cycle to execute one instruction in a computer system briefly.	
	c.	Explain the memory interleaving technique with suitable example.	
	d.	Differentiate CISC and RISC processor.	
	e.	Distinguish between hardware control and microprogrammed control.	
	f.	Explain working principle of DMA.	
	g.	Define interrupt. Explain interrupt driven IO.	
	h.	Define pipeline. Explain pipeline execution in processor briefly.	
3		Explain classification of memory in a computer.	10
4		Write the function of bus. Explain the single bus structure briefly with suitable diagram.	2+6+2
5		Define addressing mode? Explain at least six addressing modes with suitable example.	1+1.5 x 6
6		Explain the Functional Units of computer	10
7		Write short notes on,	10
	i.	Fixed word length memory.	
	ii.	Variable word length memory.	
	iii.	Big endian assignment	
	iv.	Little endian assignment	

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Th2- Data Structure

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
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1. Answer **All** questions 2 x 10
   a. Name four data structure.
   b. What is concatenation operation in string? Give one example.
   c. Define sparse matrix. Give one example.
   d. What is Garbage collection?
   e. Define merging operation.
   f. Define Recursion.
   g. What is circular queue?
   h. Convert into Postfix
      (i) (a+b)/(c-d)
   i. Write two advantages of linked list.
   j. What is the significance of Path Matrix?

2. Answer **Any Six** Questions 6 x 5
   a. What do you mean by complexity of an Algorithm? Explain space and time complexities.
   b. Define string. Explain different string operations.
   c. What is multidimensional array? Derive an expression of addressing A[I,J] in a two dimensional array by (i)Row_Major and (ii) Column _Major order
   d. Define Stack. Write PUSH and POP algorithm.
   e. What do you mean by searching? Explain Binary searching with suitable example.
   f. Define Graph. Draw a Graph and write the Adjacency matrix.
   g How Binary tree is represented in memory? Explain tree traversal.

3 Define Sorting. Write the algorithm for Bubble sorting. Explain with a suitable example. 10

4 Define binary search tree. Explain how insertion and deletion operations takes place in a binary search tree with suitable example. 10

5 Why Linked list is needed? Write an algorithm for traversing a linked list. Explain how it is represented in memory 10

6 Define linear array. Write algorithm to inset and delete element at m^{th} location of the array. 10

7 What do you mean by Hashing? Write the different hashing techniques. Explain collision resolution techniques. 10

3RD SEM./ ETC/ CSE/ IT/ AE&I/ EIC/Mechatronics / 2020(W)NEW

Th3- DIGITAL ELECTRONICS

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

a. State Demorgan's theorem.
b. Why multiplexers are referred to as data selectors?
c. Write down the necessity of A/D and D/A converters.
d. What is universal shift registers?
e. Define modulus of a counter.
f. Define the term fan In and fan Out.
g. Define racing condition in flip-flop. How it can be avoided?
h. Convert (10110101) from binary to gray code.
i. Perform 2's complement subtraction of 1000011-1010111.
j. What is K-map?

2. Answer **Any Six** Questions 6 x 5

a. Discuss 1:4 De-multiplexer with circuit, truth table and implementation by gates.
b. Show the diagram of a clocked SR flip-flop. Explain its working with a functional table.
c. Obtain the real minimal expression for f = $\sum m(1,2,4,6,7)$ and implement it using universal gates.
d. Explain the working of SISO and PISO register with the help of suitable logic diagram.
e. Simplify the Boolean expression: Y=AB+A(B+C)+B(B+C) and draw the logic circuit for the simplified function.
f. Design an octal to binary encoder with neat circuit diagram.
g. Write down all the characteristics of Digital ICs.

3 Show the logic diagram of clocked J-K flip-flop. Explain its working with a functional table with a neat circuit diagram. 10

4 Design a 3 bit magnitude comparator circuit for whose outputs are A>B, A<B and A=B where A & B are 3 bits binary numbers. 10

5 Which gates are referred to as Universal gates and why? How other gates can be implemented by using one of these gates? 10

6 Explain D/A conversion using R-2R ladder(weighted resistors) network. 10

7 Design a 2-bit asynchronous ripple counter (up and down) using flip-flop with a suitable logic diagram& timing diagram. 10

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TH4 Object Oriented Methodology

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
   a. Define object.
   b. Define data abstraction.
   c. Define constructor.
   d. Define polymorphism.
   e. Define API.
   f. Define package.
   g. Differentiate between actual and formal parameters.
   h. Differentiate between local and global variable.
   i. Explain "garbage collection" in object oriented methodology.
   j. Differentiate subclass and superclass.

2. Answer **Any Six** Questions 5 x 6
   a. Explain the concept of method overloading using suitable examples.
   b. Explain the decision control statements with proper examples.
   c. Differentiate between while and do-while loop, using suitable example.
   d. Write a program to find the factorial of a number using method invocation in object oriented methodology.
   e. Explain different types of constructors briefly.
   f. Define Abstract class? Explain the use of abstract class in object oriented programming.
   g. Explain different features of object oriented programming

3. Write a program using the object oriented concept, where the user input a number, and the system should display the reverse of that number. 10

4. Explain different types of operators with suitable examples. 10

5. Explain different types of inheritance with suitable examples. 10

6. Define exception. How exception can be handled? Explain in brief. 10

7. What is the importance of switch case in programming? Design a calculator program using switch case, where the user inputs two numbers and an operator (example: +,-,*,/); the output should be displayed based on the operator. 10

3RD SEM./COMMON /ALL Branches 2020(W) NEW

Full Marks: 80

TH 5 Environmental Studies

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

   a. Define Environment.

   b. Define deforestation.

   c. What do you mean by decomposers?

   d. What are hot spots of biodiversity?

   e. Define eco system.

   f. Write down psychological effect of noise pollution.

   g. What is solid waste management?

   h. Define green house effect.

   i. What are the major reasons of population explosion?

   j. What is Draught?

2. Answer **Any Six** Questions 6 x 5

   a. What are causes of deforestation.

   b. What are the environmental effects of mining.

   c. Give a brief description about structures of a pond eco –system.

   d. Discuss about 3R in controlling environmental pollution.

   e. What is global warming ? Write down the effects of global warming?

   f. Discuss about rain water harvesting?

   g. What is the role of an individual in controlling pollution of environment?

3 What is the need of land resources? Write the main reasons of degradation of land? 10

4 What are the changes made in agriculture? Write down the impacts of modern agriculture on environment? 10

5 What are ecological pyramids? Explain the pyramid of number and pyramid of energy? 10

6 Explain the sources of solid waste and solid waste management? 10

7 Write short notes on 10

   a. World food problem

   b. Acid rain