5TH SEM./CSE/IT/ 2022(W)

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. Define clock rate.
   b. State the function of accumulator.
   c. What does RISC and CISC stands for?
   d. What do you mean by cycle stealing?
   e. State the amdahl's law.
   f. What is volatile memory?
   g. Define polling.
   h. Differentiate between direct and indirect addressing modes.
   i. What is multiprocessor?
   j. Define the term computer architecture.

2. Answer **Any Six** Questions 6 x 5
   a. Explain the different instruction format with a suitable example.
   b. Draw a functional block diagram of a computer and explain the function of each unit.
   c. How an instruction is executed? Explain the steps of instruction cycle.
   d. Explain the segmentation technique used in virtual memory with a suitable example.
   e. Define interrupt service routine. Explain the characteristics of interrupt handling mechanism.
   f. Explain in detail multiple bus architecture.
   g Define RAM. Discuss different types of RAM.

3 Illustrate how memory addressing and memory operation is done in a personal computer. 10

4 Identify the most popular method of data transfer. Explain interrupt driven I/O method of data transfer. How it is different from programmed I/O data transfer? 10

5 Classify organisation of computers using Flynn's criteria 10

6 Explain in detail SCSI Bus standards. How it is different from USB? 10

7 Define pipeline. Describe the different types of pipeline hazards 10

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Th-2 Data Structure

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. Name two linear and nonlinear data structure.

   b. What are the methods to implement queue in memory?

   c. Convert the infix expression (A-B/C)*(D/E-F) into a postfix.

   d. Name two searching technique. In a sorted array, which searching technique can be used?

   e. Write the output.
   int a[] = {1,2,3,4}; int b[4] = {5,6,7,8};
   printf("%d,%d", a[0], b[0]);

   f. char str1[20]=”hello”, str2=”world”;
   printf(“%s\n”,strcat(str2,str1));

   g. Define garbage collection.

   h. What is complete binary tree?

   i. Define adjacent nodes?

   j. What do you mean by open addressing?

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

   a. Define array. Write an algorithm for insertion in an array.

   b. State the difference between stack and queue.

   c. Define string and discuss about different string function with example.

   d. Define tree. Discuss how tree can represent in memory.

   e. Define linked list. Discuss about different type of linked list. Write the advantages of Linked List over an array.

   f. Discuss about different hashing functions.

   g Explain complexity of an algorithm and the space time trade off of an algorithm.

3 Write an algorithm for bubble sort and explain it with an example. 10

4 List various fundamental file organization techniques and explain each in brief. 10

5 Define queue and write an algorithm for insertion and deletion from a queue. Discuss about circular queue insertion and deletion with example. 10

6 Discuss following with reference to graphs. 10
   (i) Directed graph (ii) Undirected graph (iii) Degree of vertex
   (iv)Null graph (v) Acyclic Graph.

7 Create a Binary Search Tree for the following data and do in-order, Preorder and Post-order traversal of the tree. 50, 60, 25, 40, 30, 70, 35, 10, 55, 65, 5 10

3RD SEM./ AE & IE /CSE /EE(I& C) / ETC & COMM./ ETC & TELECOMM./ IT/ MECHATRONICS/ 2022(W)

Th-3 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. Define Racing conditions.

   b. Covert the decimal number $(1000)_{10}$ into hexadecimal.

   c. Write down the difference between synchronous and asynchronous Counter.

   d. Design a Half adder using basic logic gates.

   e. Perform 2's complement subtraction of 1000011 – 1010111.

   f. What is difference between weighted and non-weighted binary code?

   g. What is Max term and Min term?

   h. State two difference between counter and register.

   i. Write down the truth table of Exclusive-NOR gate.

   j. Convert $(101011110.1011)_2$ to Octal and hexadecimal number.

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

   a. Which gates are referred as universal gates and why? How other gates can be realized using NAND gate?

   b. Design an 8:3 Encoder with neat circuit diagram.

   c. Distinguish between combinational and sequential logic circuit.

   d. Describe the operation of full subtractor with the help of truth table and circuit diagram.

   e. Convert D-type flip flop to SR flip flop.

   f. Explain the operation of seven segments displays.

   g Design a 2 bit magnitude comparator circuit for whose outputs are A>B, A<B and A=B where A and B are 2 bits binary numbers

3	Define SOP and POS term. Obtain the canonical SOP and POS form and draw the truth table of the given function. Y(A,B,C)=A+$\overline{BC}$	10
4	What is shift register? Explain the working of SISO and PISO register with the help of suitable logic diagram	10
5	Sketch the logic diagram of clocked JK flip flop. Explain it's working with the functional table.	10
6	With neat circuit diagram explain the function of 4:1 multiplexer and 1:4 demultiplexer.	10
7	What is Karnaugh map? Simplify the given expression using Karnaugh's map and draw the logic Circuit using NAND gate only. F(a,b,c,d)=∑m(5,6,7,8,9)+d(10,11,12,13,14,15).	10

3RD SEM./ CS&E/IT/2022(W)

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 Data Abstraction.

b. Define JVM.

c. Write the difference between widening and narrowing type casting.

d. What are the different access modifiers in Java?

e. string s=" OBJECT ORIENTED METHODOLOGY".
system.out.println(s.length());
Write the output.

f. Classify between final and finally statement.

g. Define package.

h. Write any two methods of input stream.

i. What is polymorphism?

j. What is the use of NEW keyword?

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

a. Define inheritance. Why multiple inheritance is not supported in Java?

b. Define constructor. Classify the different types of constructor.

c. Differentiate between compile time polymorphism and run time polymorphism.

d. Explain the structure of a java program with example.

e. Define stream. Describe the output stream of Java.

f. Define variable. Discuss different types of variable in Java.

g Write the object oriented and procedure oriented program.

3 Differentiate between String, String Buffer and String Builder. 10

4 Define package. Write a program to create an user defined package and import it. 10

5 Define exception. Classify the different types of java exception. Write a program using java exception. 10

6 Briefly explain the concepts of OOPS. 10

7 Compare all looping statements available in java with example. 10

3RD SEM. / COMMON / 2022(W)

Th-5 Environmental studies

Full Marks: 80 Time- 3 Hours

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 natural resources.

   b. Write down two examples of non-renewable resources.

   c. Define soil erosion.

   d. Define producers in eco system.

   e. What is bio diversity?

   f. What do you mean by poaching of wild life?

   g. What is the unit of sound intensity?

   h. What is endangered species.

   i. Define greenhouse effect.

   j. What are the various objectives of family welfare programme.

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

   a. What are the environmental effects of mining?

   b. Give a brief description of man wild life conflict.

   c. What are the effects of acid rain.

   d. Define rainwater harvesting? State the objective of rain water harvesting?

   e. Describe about Bio gas plant.

   f. Write down the role of an individual protecting environment.

   g What are the effects of modern agriculture?

3 Define Global warming, write down the causes and effect of global warming. 10

4 Explain sources of solid waste and solid waste management. 10

5 Describe aquatic ecosystem. 10

6 Write down the effect, prevention and control of noise pollution. 10

7 Write short notes on 10
   a. Pyramid of energy
   b. Green house effect