Hall Ticket Number:

II/IV B.Tech (Supply) DEGREE EXAMINATION
APRIL, 2018
(First Semester)
CSE/IT
(Computer Organization)

Time: Three Hours **Maximum :** 60 Marks

Answer Question No.1 compulsorily. (1X12 = 12 Marks)

Answer ONE question from each unit. (4X12=48)

1. Answer all questions (12X1=12 Marks)

a) Define MIPS Rate.
b) What is register indirect addressing mode? When it is used.
c) Differentiate between RISC and CISC.
d) For the given, 1) Pipelining with operand forwarding and out-of-order execution. 2) Simple Pipelining 3) Super scalar execution 4) Non-pipelining.
Arrange the above 4 concepts ascending order based on No of Cycles.
e) What is DMA? Mention it's advantages.
f) Define the terms hit, miss and ratio with respect to cache.
g) What is meant by data hazards in pipelining?
h) What is a Range of 2s Compliment numbering system?
i) What is the role of program Counter(PC) and IR(Instruction Register) ?
j) What are the various types of operations required for instructions?
k) Specify the three types of the DMA transfer techniques?
l) How the interrupt is handled during exception?

UNIT – I

2. A) What are the basic functional units of a computer? Explain the operational concepts of a computer with a neat sketch. **(6M)**

B) Write the assembly language instructions for the following code using the instruction set Move, Compare, Add, Subtract and Branch. Assume that every instruction can have utmost one memory location and the word size is 32 bits. If the memory address of the first instruction is 1000, calculate the memory address of all the instructions.

```
int a,b,c;
if(a==b)
c=a+b
else
 c=a-b;
```

(6M)

(OR)

3. a) Explain Shift and Rotate instructions. **(6M)**

b) What is an addressing mode? Explain various addressing modes with examples. **(6M)**

UNIT – II

4. a) Differentiate between Single channel and Multi channel bus. **(6M)**
b) Compare Hardwired control unit and Micro programmed control unit **(6M)**

(OR)

5. a) Explain about IEEE-754 single precision and Double precision methods. **(6M)**
b) Multiply 11010 with 10110 using booths algorithm. **(6M)**

UNIT – III

6. In a 64-Bit Computer System, The Size of Cache memory is 1 GB and Main memory size is 4GB and Each Block is having 16 Words and Each Word is having 32 Bytes. Then Calculate the No of Blocks in Cache Memory and Main Memory. And also Calculate No of bits for Tag, Block/Set, Word and Byte bits in a given Address in Direct Mapping and 8-way set associative Mapping.

Note: CM/MM divided into blocks, Blocks divided into words, Words into bytes. **(12M)**

(OR)

7. For the Given Assembly level program, List out the Data Hazards on the operands for the given instructions. And also Calculate the No of Cycles using pipelining and 4-tier Superscalar pipelining architecture.
Note: For Executing Each instruction, It has 5 stages, IF, ID, OF, EX, WB. and EX stage takes 2 cycles for Load and Store, 3-cycles for ADD and SUB, 4- Cycles for MUL, remaining stages takes one cycle.

Load A,R1
Load B, R2
Load C R3
Add R1,R2,R3
Sub R2,R1,R3
Store R3,C
Mul R1,R3,R2
Store R2,B

(12M)

UNIT – IV

8. (a) What are the different kinds of I/O Communication techniques? What are the relative advantages and disadvantages? **(6M)**

(b) Explain Different kind interruption handling mechanisms, What is DMA role in interruption handling mechanisms. **(6M)**

(OR)

9. Explain the following I/O Interface standards in detail. a) PCI b) SCSI c)USB **(3 X 4=12M)**

CS/IT 215

Hall Ticket Number:

II/IV B.Tech (Supplementary) DEGREE EXAMINATION

April, 2018 — **Computer Science And Engineering**

Third Semester — **Discrete Mathematical Structures**

Time: Three Hours — **Maximum :** 60 Marks

Answer Question No.1 compulsorily. (1X12 = 12 Marks)

Answer ONE question from each unit. (4X12=48 Marks)

1. Answer all questions (1X12=12 Marks)
   a) In how many ways can 12 of the 14 people be distributed into 3 teams of 4 each?
   b) Draw the truth table **~ P V ~ (~Q).**
   c) What is power set of A = {ø}?
   d) Write the following statements into symbols using predicate logic
      Every husband argues with his wife.
      `X' is A husband.
      Therefore, `X' argues With his wife"
   e) How many ways can 10 people seated in a row so that certain pair of them next to each other.
   f) Compute the first four terms of sequence of $a_n = a_{n-1} + n$, $n \geq 1$ where $a_0 = 1$.
   g) Define Recurrence relation.
   h) Give an example to disprove every poset has a maximal element.
   i) Define Equivalence Relation.
   j) Define weighted graph.
   k) Define cycle and circuit.
   l) Define Directed path.

UNIT I

2. a) Determine whether the following is tautology or not:
      $[p \rightarrow (q \rightarrow r)] \rightarrow [(p \rightarrow q) \rightarrow (p \rightarrow r)]$ 6M
   b) Prove that by mathematical induction $3n < n!$ whenever n is a positive integer greater than 6? 6M

(OR)

3. a) State whether the argument given is valid or not. If it is valid identify the tautology on which it is based.
      If Clifton does not live in France, then he does not speak French.
      Clifton does not drive a Datsun.
      If Clifton lives in France, then he rides a bicycle.
      Either Clifton speaks French, or he drives a Datsun.
      Hence, Clifton rides a bicycle. 9M
   b) b) State the converse, opposite, and contrapositive to the Statement
      If triangle ABC is a right triangle, then $|AB|^2 + |BC|^2 = |AC|^2$. 3M

UNIT II

4. a) How many different five digit numbers can be formed from the digits 0,1,2,3 and 4? 6M
   b) There are 35 students and 04 teachers. In how many ways every student shakes hand with other students and all the teachers. [6M] 6M

(OR)

5. a) Find the coefficient of x^{16} in $(1 + x^4 + x^8)^{10}$. 6M
   b) How many integral solutions are there of $X_1 + X_2 + X_3 + X_4 + X_5 = 20$ where $x_1 \geq -3$, $x_2 \geq 0$, $x_3 \geq 4$, $x_4 \geq 2$ and $x_5 \geq 2$? 6M

UNIT III

6. a) Solve the Recurrence Relation $a_n - 7a_n\text{-}1 + 10a_n\text{-}2 = 0$ for $n \geq 2$. 6M

   b) Consider the relation R={(a,b),(b,c),(b,d),(d,a),(c,c)}.
      i. Draw a digraph for the relation R.
      ii. Draw a digraph for the relation inverse of R, R^{-1}.
      iii. Draw a digraph for the relation complement of R, R^c.

   Draw a digraph for the relation intersection of R and inverse of R, $R \cap R^{-1}$. 6M

(OR)

7. a) Find a solution to the recurrence relation $a_n\text{-}5a_{n-1}+6a_{n-2}=n(n-1)$ using generating functions method. 6M

   b) State and explain the 6 special properties of a binary relation. 6M

UNIT IV

8. a) For the poset [$\mathbf{D_{30};|}$] draw a poset diagram and determine all maximal and minimal elements and greatest and least elements if they exist. Also specify whether it is a lattice or not. 6M

   b) If G is a connected plane graph then prove that $|V| - |E| + |R| = 2$ 6M

(OR)

9. a) Define isomorphism? And explain isomorphism with suitable example? 6M

   b) Give the adjacency matrix of the digraph G { (a,b,c,d), R} where R = { (a,b),(b,c),(d,c),(d,a) }. 6M

CS/IT 216

Hall Ticket Number:

II/IV B.Tech (Supplementary) DEGREE EXAMINATION

April, 2018 **Common to CSE & IT**

Third Semester **Data Structures**

Time: Three Hours **Maximum:** 60 Marks

Answer Question No.1 compulsorily. (1X12 = 12 Marks)

Answer ONE question from each unit. (4X12=48 Marks)

1. Answer all questions (1X12=12 Marks)
   a) What is a data structure?
   b) What is the time complexity?
   c) What is the concept of linked list?
   d) What are the different applications of stack?
   e) What is the time complexity of merge sort in all the cases?
   f) Find the value of the prefix expression + - * 2 3 5 / ^ 2 3 4.
   g) Define binary tree.
   h) Define balance factor of a node in a binary tree.
   i) Define expression tree.
   j) Define hashing.
   k) Distinguish between minheap and maxheap.
   l) Define a directed graph.

UNIT I

2. a) Discuss different asymptotic notations with examples? 8M
   b) What are the advantages of linked lists over arrays? 4M

(OR)

3. a) Write a C program to implement insertion and deletion operations on single linked list. 8M
   b) Write a C routine to concatenate two double linked lists. 4M

UNIT II

4. a) Explain Stack ADT and Queue ADT. 4M
   b) Write a C program to implement stack using linked list. 8M

(OR)

5. a) Write an algorithm to perform insertion and deletion operations on circular queue. 6M
   b) Write a C program to convert an infix expression into postfix expression. 6M

UNIT III

6. a) Write a C program to construct BST and to perform traversals on the tree. 8M
   b) Write a C routine for searching a node in a binary tree. 4M

(OR)

7. a) Construct BST for the following data elements 6M
   15, 25, 40, 34, 70, 10, 30, 60, 12
   b) Discuss different AVL tree rotations with examples. 6M

UNIT IV

8. a) Discuss the collision resolution techniques linear probing and double hashing. 6M
   b) Explain Heat sort algorithm. Sort the following list of elements using heap sort 6M
   97, 22, 40, 110, 31, 86, 68, 4, 51, 42

(OR)

9. a) Explain Hashing technique separate chaining. 4M
   b) Discuss in detail BFS and DFS graph traversal methods. 8M