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**M.Sc. (I.T.) (Semester-I)
EXAMINATION, 2017**

Paper-MIT-101

**OPEN SOURCE TECHNOLOGY &
OPERATING SYSTEM**

Time allowed : Three hours

Maximum marks : 80

Part-A (Compulsory) {Marks : 10}

Answer all ten questions (20 words each).

Each question carries equal marks.

Part-B (Compulsory) {Marks : 10}

Answer all five questions (50 words each).

Each question carries equal marks.

Part-C {Marks : 60}

Answer any three questions (400 words each), selecting one from each unit.

Each question carries equal marks.

PTO

Part-A (Compulsory)

1. What is batch operating system ?
2. What is Thrashing ?
3. What is system calls ?
4. What is real time system ?
5. What is PCB ?
6. What is co-operative process ?
7. What are the benefits of co-operating process ?
8. State the advantages of multiprocessor system.
9. Define CPU Scheduling.
10. What is dispatch latency ?

Part-B (Compulsory)

11. Compare user thread and kernel threads.
12. What is Banker's algorithm ?
13. Define logical address and physical address.
14. List the various file attributes and what are the information associated with an open file.
15. What are the advantages and disadvantages of contiguous allocation of disk space ?

Part-C

Unit-I

16. Define kernel. Explain the different kernel architecture in detail. $2\frac{1}{2}$

Or

What is Scheduling ? Use the following scheduling algorithm to calculate ATAT and AWT for the following process :

- (i) FCFS

(ii) Pre-emptive and non-pre-emptive STF

(iii) Pre-emptive priority

Process	Arrival time	Burst time	Priority
P_1	0	8	3
P_2	1	1	1
P_3	2	3	2
P_4	3	2	3
P_5	4	6	4

Unit-II

17. Explain the concurrent system with example. What are the problem associated with the critical region and how to solve using semaphore.

Or

Differentiate between Paging and Segmentation. Also explain various page replacement algorithms.

Unit-III

18. Explain the conditions for deadlock and also explain how deadlock can be determined with the help of resource allocation graph.

Or

Write short notes on :

- (i) Interprocess Communication
- (ii) Basic networking commands in linux

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**M.Sc. (Information Technology) (Semester-I)
EXAMINATION, 2017**

Paper-MIT-102

C PROGRAMMING WITH DATA STRUCTURES

Time allowed : Three hours

Maximum marks : 80

Part-A (Compulsory) {Marks : 10}

Answer all ten questions (20 words each).

Each question carries equal marks.

Part-B (Compulsory) {Marks : 10}

Answer all five questions (50 words each).

Each question carries equal marks.

Part-C {Marks : 60}

Answer any three questions (400 words each), selecting one question from each unit. Each question carries equal marks.

PTO

Part-A (Compulsory)

1. Explain Bitwise operator.
2. What is function prototype ?
3. Give an example of function returning pointer.
4. What is structured programming ?
5. List out any two application of graph.
6. Define spanning tree.
7. What is the purpose of preprocessor directives ?
8. What is the meaning of function call strcpy (S_1 , S_2) ?
9. What will be the value of X after executing the program ?

```
void main ( )
```

```
{
```

```
int x;
```

```
x = printf("I See, Sea in C");  
printf("\n %d", x),  
}
```

10. Arrange the given array using bubble sort

{12, 4, 7, 5, 10, 1}

Part-B (Compulsory)

11. What are recursive function ?
12. Assume and draw a graph and find the indegree and outdegree of a node.
13. List the differences between structure and union.
14. What will be the output of the following programme code :

```
void main ( )  
{  
  
    char a [ ] = "Hello World !";
```



```
char *p;
```

```
p = a;
```

```
printf("\n %d %d %d %d", size of (a), size of (p), stelen  
(a), strlen (p));
```

```
}
```

15. Write the following expression in prefix and postfix notation

$(A+B*C) * D - E/F + G * H.$

Part-C

Unit-I

16. Explain primary data type and their range—also discuss user defined data type in detail. (5) 20

Or

- (a) What are the two common ways of selecting array elements for processing ? 10
- (b) Differentiate between Dynamic and Non-dynamic data structure. 10

Unit-II

17. Write a C programme that :

- (i) Implements string concatenate operations STRCAT (str1, str2) without using library functions. 10
- (ii) Read a sentence and prints frequency of each of the vowels and total no. of consonants. 10

Or

- (a) Explain array of structure and structure within a structure with example. (v.) 10
- (b) What is a pointer ? Explain how the pointer variable declared and initialized. (v.) 10

Unit-III

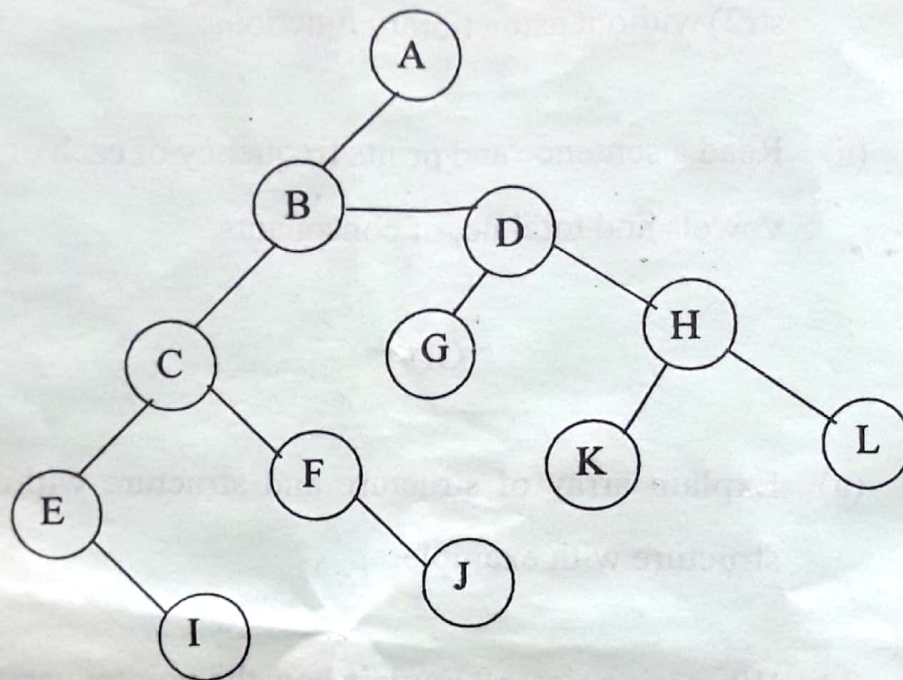
18. Describe the linked implementation of stacks and queues. (5) 20

Or

Explain the operations on binary trees. Write the Algorithm

and find the inorder, preorder, and post-order traversals
for the binary tree :

20



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**M.Sc. (Information Technology) (Semester-I)
EXAMINATION, 2017**

Paper-MIT-103

**RELATIONAL DATABASE MANAGEMENT
SYSTEM**

Time allowed : Three hours

Maximum marks : 80

Part-A (Compulsory) {Marks : 10}

Answer all ten questions (20 words each).

Each question carries equal marks.

Part-B (Compulsory) {Marks : 10}

Answer all five questions (50 words each).

Each question carries equal marks.

Part-C {Marks : 60}

Answer any three questions (400 words each), selecting one from each unit.

Each question carries equal marks.

PTO

Part-A (Compulsory)

1. What is object based database ? 1
2. Define distributed transaction. 1
3. What is DTD ? 1
4. Define data fragmentation. 1
5. What is XML and how it is used ? 1
6. Define the term normalisation. 1
7. Define the term referential integrity. 1
8. What is commit protocol ? 1
9. What is recursive query ? 1
10. What do you mean by implicit cursor ? 1

- (b) How Information are stored and retrived from XML database ? 8

Or

What is Normalization ? Explain 1NF, 2NF, 3NF and BCNF, 4NF with example. 20

Unit-III

18. (a) What do you mean by SQL aggregate function ? Explain SUM (), MIN (), MAX (), AVG () and COUNT () functions with example. 10
- (b) What is trigger ? Explain with example. Create a trigger that does not permit deletion of any row from emp table on Sunday. 10

Or

- (a) What is query optimization and processing ? Also explain heuristics in query optimization. 10
- (b) Explain external sorting and association rule in mining. 10

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**M.Sc. (Information Technology) (Semester-I)
EXAMINATION, 2017**

Paper-MIT-104

ALGORITHMS

Time allowed : Three hours

Maximum marks : 80

Part-A (Compulsory) {Marks : 10}

Answer all ten questions (20 words each).

Each question carries equal marks.

Part-B (Compulsory) {Marks : 10}

Answer all five questions (50 words each).

Each question carries equal marks.

Part-C {Marks : 60}

Answer any three questions (400 words each), selecting one from each unit.

Each question carries equal marks.

PTO

Part-A (Compulsory)

1. Define best case time complexity.
2. Define worst case time complexity.
3. Which sorting algorithm has the worst time complexity of $n \log n$?
4. What do you mean by recurrence equation?
5. Draw binary tree for the following expression :

$$(A+B)-(C+D * E) / F * G$$

6. Define NP problem.
7. What is the depth of complete binary tree?
8. What is convex hull?
9. What do you mean by halting problem?

10. What is graph ?

Part-B (Compulsory)

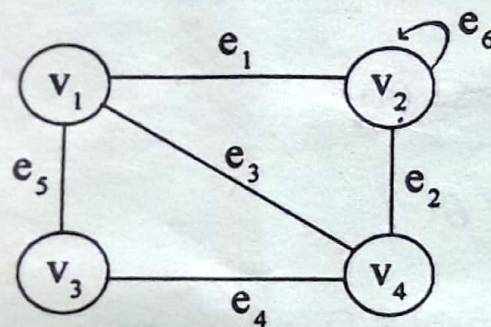
11. Write an algorithm to multiply two 2D matrices and also find its time complexity.

12. Write down the steps of greedy algorithm.

13. What is minimum cost spanning tree ?

14. Explain brute force algorithm.

15. Create adjacency matrix for the following graph :



Part-C

Unit-I

16. What is divide and conquer strategy ? Explain it with merge sort algorithm. Also write its time complexity.

Or

Explain quick sort algorithm with suitable example. Also write its time complexity analysis.

Unit-II

17. Explain Big-Oh, Small Oh, Big Omega, Small Omega and theta notation with examples. (2)

Or

Explain recurrence equation with tower of Hanoi example.

Unit-III

18. Justify whether the statements below are correct :

(i) $3n+2 = O(n)$

(ii) $3n+2 = \Omega(n)$

(iii) $3n+2 = \theta(n)$

(iv) $10n^2+4n+2 = O(n^2)$

Or

Explain binary search tree and its traversing with suitable example. (4)