Question Paper

Exam Date & Time: 09-Jan-2023 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences (MSIS), Manipal
First Semester Master of Engineering - ME (Cloud Computing) Degree Examination - January 2023

Linux and Data Structures [CDC 5104]

Marks: 100 **Duration: 180 mins.**

Monday, January 9, 2023

Answer all the questions.

1) **Explain architectural components of the linux kernel. (TLO 1.1)** (10)

2) **Illustrate 5 stage process state transition with a neat diagram. (TLO 2.1)** (10)

3) **Given 5 processes with there arrival and CPU burst times given below, Compute the following metrics using FCFS scheduling algorithm:** (10)
1. Gantt Chart
ii. Percentage CPU utilization
iii. Average Turnaround Time
iv. Average Waiting Time
v. Throughput
vi. Average Response Time (TLO 2.1)

Scheduling Table

Process	Arrival time	CPU Brust Time
P1	3	4
P2	5	3
P3	1	2
P4	5	1
P5	4	3

4) **What is an Algorithm? Explain space and time complexity with an example. (TLO 3.1)** (10)

5) **Consider the following code snippet, illustrate how the memory is allocated inside the stack? (TLO 4.1)** (10)

```
void fun2(int i)
{
    int a;
    ---
    ---
}

void fun1()
{
    int x;
    fun2(X);
}
```

```
void main()
{
    int a;
    float b;
    ---
    ---
    fun1();
    ---
}
```

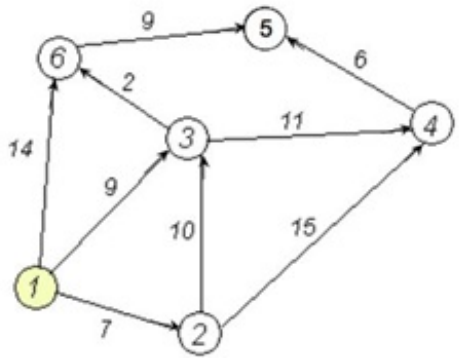
6) **Illustrate to convert a infix expression to post fix expression K + L - M * N + (O ^ P) * W / U / V * T + Q. (TLO 4.1).** (10)

7) **Explain with a code snippet pre-order, post-order and in-order traversal of a binary tree. (TLO 4.1)** (10)

8) **Write algorithm for Merge Sort and trace 9, 7, 3, 6, 2. (TLO 5.1)** (10)

9) **Write algorithm for binary search. Write a C program to implement binary search using recursive programming. (TLO 5.1)** (10)

10) **Write Dijikstra's algorithm to find single source shortest path. Discover single source shortest path for the graph considering node 1 as source. (TLO 7.1)** (10)



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