

Junior Technical Superintendent (CSE)

Descriptive Test (Level-2)

18.11.2023

Total Marks: 60

Duration of Exam: 120 Mins

- This question paper has 4 printed pages
- Contains two parts (Part-A and Part-B)
- Part-A carries 30 marks
- Part-B carries 30 marks

Part- A

- Attend any 10 questions out of 13
- Each question carries 3 marks

A01) Consider the following code snippet for initial values of an array. For the purpose of determining the largest and second largest elements in v1 and v2 respectively, what should be the statements in the blanks below? Do not use any other variables than already given.

```
int a[11] = {1, 7, 3, 2, 5, 4, 6, 9, 8, 13, -5};  
int i, v1, v2; //temporary variables
```

```
v1 = a[0];  
for(i=1;i<11;i++) {  
    if(v1 < a[i]) {  
        __?BLANK 1_  
        __?BLANK 2_  
    }else if(v2 < a[i]) {  
        __?BLANK 3_  
    }  
}
```

A02) Consider the following code snippet for the purpose of sorting the elements. Is there any problem with the logic? Consider line numbers given for writing specific comments.

L1	int a[4] = {1, 7, 3, 2};
L2	int i, j, v; //temporary variables
L3	for(i=0;i<3;i++) {
L4	for(j=i+1;j<4;j++) {
L5	if(a[i]<a[j])
L6	v = a[i]; a[i] = a[j]; a[j] = v;
L7	
L8	}
L9	}

A03) Consider the following code snippet involving function invocations. Assume there are no errors and the code executes fine. What is the printed value?

L1	int a = 10;
L2	int func(int a) {
L3	a = a + 1;
L4	}
L5	for(;a<20;a++) {
L6	func(a);
L7	}
L8	printf("%d\n",a);

A04) What is the broad purpose of each of the following apt-packages?

(i) ufw, (ii) iptables

A05) Which of the following are process administration and monitoring utilities?

(i) ps, kill; (ii) top, htop; (iii) pgrep, pkill; (iv) systemctl, (v) pr, head, tail

A06) What is UEFI and what are any three of its very distinctive advantages in the context of Windows?

A07) What are the ways to address IP fragmentation and Reassembly?

A08) What lookup tables are involved for end-to-end communication, say, for web browsing over the Internet?

A09) Which of the following is most appropriately true about a switch and a router and why?

(i) Switch requires IP address; (ii) Router does not require IP address; (iii) Switch determines the best path; (iv) Router determines the best path

A10) Consider the following code snippet. Is this code executed on the client browser?

```
Welcome <?php echo $_GET["name"]; ?><br>
```

A11) Consider the following code snippet. What are the major steps on the server side?

```
<form method="post" action="test_form.php">...
```

A12) Consider the following code snippet. What happens when the client requests server response from the script below?

```
<?php
$x = 1;
while($x <= 5) {
    echo "The number is: $x <br>";
}
?>
```

A13) State any three protocols related to E-mail communications and very briefly explain.

Part- B

- Attend any 6 questions out of 10
- Each question carries 5 marks

B01) Consider the following code snippet for finding k-th smallest element. Assume there are no syntax errors and the code executes fine. What is the minimal modification to the code to achieve the task? Indicate the line numbers along with the code that needs to be changed.

L1	int a[100]; //assume randomly initialized
L2	int i,j,t,k=13,n=100;
L3	for(i=0;i<n-1;i++) {
L4	for(j=i+1;j<n;j++) {
L5	if(a[i]<a[j]) {
L6	t=a[i]; a[i] = a[j]; a[j] = t;
L7	}
L8	}
L9	}
L10	print("k-th smallest element is %d\n",t)

B02) Consider the following code snippet for generating fibonacci series of numbers. Fill in the blanks with correct code.

L1	int a[100]; //assume all values are initialized to zero
L2	int fib(int n) {
L3	__?BLANK__
L4	if(n<=2) return 1;
L5	__?BLANK__
L6	__?BLANK__
L7	return a[n];
L8	}
L9	fib(20); //invoking

B03) Consider the merge sort algorithm for ascending order as given in the code snippet below. Fill in the blanks with correct code (simple one statement code).

	int a[100]; //assume already sorted in ascending order
	int b[123]; //assume already sorted in ascending order
	inc c[223]; //output array to be filled
	 //Analyze the code snippet below
	i=j=k=0;
	while(i<100 && j<123) {
L1	if(a[i]<=a[j]) {
L2	__?BLANK__
L3	__?BLANK__

L4	}
L5	else {
L6	___?BLANK___
L7	___?BLANK___
L8	}
L9	___?BLANK___
L10	}

B04) Consider the following statements for installing Ubuntu on top of Windows 10 on a BIOS system. Which is the most appropriate sequence of operations?

S1: Install Linux; S2: Connect Ubuntu boot device; S3: Open BIOS settings; S4: Create Linux partition; S5: Interactive Ubuntu OS loader; S6: Specify boot device in BIOS; S7: Select correct partition for Format column; S8: Perform Format column

B05) Which of the following is the most appropriate order for netboot?

S1: BIOS prompts for PXE; S2: Local boot service executes; S3: TFTP to fetch NBP; S4: DHCP to discover boot server; S5: Start the received boot program; S6: Select network boot in BIOS;

B06) Consider the following statements for installing Windows on top of Ubuntu. Which of the following sequences is most appropriately correct?

S1: create primary NTFS partition; S2: install Gparted on Ubuntu; S3: grub menu shows Windows option; S4: select Windows boot device in BIOS; S5: connect USB Windows installation drive; S6: boot repair grub; S7: select Ubuntu boot device in BIOS; S8: install Windows into NTFS partition; S9: connect USB Ubuntu installation drive

B07) State and very briefly explain any 4 prominent utilities in Linux for ip, network & port administration and monitoring?

B08) What is VLSM? State any three routing protocols that support VLSM.

B09) Give an example of a valid SQL query for each of the DDL, DML and DCL type of statements of a relational Database system (consider MySQL).

B10) Give a very simple code snippet of how sessions are handled and where session variables are stored in PHP on the server side. How are the session variables cleared and how is a session ended?
