Course Name: Blockchain and its Applications (NOC25_CS08)

Assignment 0 - Week 0 (Jan 2025)

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 10 **Total mark: 10 X 1 = 10**

QUESTION 1

What will be the output of the following C code?

```
#include <stdio.h>
int increment(int *x) {
    return *x++;
}
int main() {
    int arr[] = {10, 20, 30};
    int temp = increment(&arr[0]);
    printf("%d", temp);
    return 0;
```

a. 10
b. 11
c. 20
d. 21

Answer: (a)

Detailed solution:
The pointer is first dereferenced, and the value is returned. Then, the pointer is incremented.

QUESTION 2

Which of the following scheduling algorithms can lead to starvation in an operating system?

a. Round-robin
b. Shortest Job Next (SJN)
c. Priority scheduling
d. None of the above

Answer: (b) and (c)

Detailed solution:
In SJN, longer jobs will starve if shorter jobs continuously arrive in the queue. Similarly, in Priority Scheduling, low-priority processes will starve.

QUESTION 3

Which of the following system calls is used to change the current working directory of a process in a Unix-based operating system?

a. `rmdir()`
b. `getcwd()`
c. `mkdir()`
d. `chdir()`

Answer: (d)

Detailed solution:
`chdir()` changes the current working directory. `mkdir()` and `rmdir()` deal with directory creation and removal, respectively.

QUESTION 4

Which of the following IP addresses belongs to a private address range?

a. 172.16.0.1
b. 192.0.2.1
c. 203.0.113.10
d. 10.10.1.1

Answer: (a) and (d)

Detailed solution:
172.16.0.1 belongs to Class B private range (172.16.0.0 – 172.31.255.255) and 10.10.1.1 belongs to Class A private range (10.0.0.0 – 10.255.255.255).

QUESTION 5

What will be the output of the following C code in a 32-bit/64-bit system?

```
#include <stdio.h>

int main() {
    int arr[10];
    printf("%lu", sizeof(arr));
    return 0;
}
```

a. 10
b. 100
c. 40
d. 4

Answer: (c)

Detailed solution:
int is 4 bytes, and there are 10 elements, so the total size is 4 x 10 = 40.

QUESTION 6

In a memory management system that utilizes paging, the address space of a process is divided into fixed-size units called _____. The equivalent units in physical memory are known as _____.

a. Segments, Blocks
b. Frames, Pages
c. Pages, Frames
d. Pages, Segments

Answer: (c)

Detailed solution:
The memory space of a process is divided into fixed-size segments known as **pages**, while the corresponding units in physical memory are referred to as **frames**. In a paging system, a page table maps these pages to their respective frames in memory.

QUESTION 7

Which of the following statements about virtual memory in an operating system are true?

a. Virtual memory allows a process to use more memory than is physically available.
b. Virtual memory uses disk space to simulate additional RAM.
c. In a system with virtual memory, all processes are allocated the same amount of physical memory.
d. Virtual memory eliminates the need for paging.

Answer: (a) and (b)

Detailed solution:
(a) Virtual memory enables processes to use more memory by leveraging disk space as an extension of RAM. (b) Virtual memory extends the available memory by extending a portion of the disk, called the swap space or page file.

QUESTION 8

Which of the following pairs correctly match network services with their associated port numbers?

a. Port 443 - HTTPS and Port 22 - FTP
b. Port 22 - FTP and Port 53 - DNS
c. Port 80 - HTTP and Port 21 - FTP
d. Port 443 - HTTPS and Port 53 - Telnet

Answer: (c)

Detailed solution:
Correct port numbers: HTTPS - Port 443, FTP - Port 21, DNS - Port 53, Telnet - Port 23, HTTP - Port 80.

QUESTION 9

To keep a hash table in memory and save it to a file for later use, which of the following combinations is correct?

a. `malloc()` to allocate memory and `fork()` to store data.
b. `calloc()` to allocate memory and `read()` to retrieve the data.
c. `malloc()` to allocate memory and `open()` to create a file.
d. `malloc()` to allocate memory and `write()` to store data in a file.

Answer: (d)

Detailed solution:
To manage a hash table, malloc() dynamically allocates memory for storing the hash table in the program's heap, and write() saves the hash table data to a file, enabling it to be reused later.

QUESTION 10

You are given the IP address 192.168.0.0/24 and need 6 subnets, each with at least 30 usable IP addresses. Which subnet mask should you use?

a. 255.255.255.240 (/28)
b. 255.255.255.224 (/27)
c. 255.255.255.192 (/26)
d. 255.255.255.248 (/29)

Answer: (b)

Detailed solution:
The correct subnet mask is 255.255.255.224 (/27), which provides 32 total IP addresses per subnet, with 30 usable IP addresses after reserving 2 for network and broadcast addresses. This allows for 8 subnets to meet the requirement of 6 subnets with at least 30 usable IP addresses each.