



**National Officers Academy**  
**Mock Exams CSS-2022**  
**January 2022(Mock-7)**  
**COMPUTER SCIENCE, PAPER-I**

**TIME ALLOWED: THREE HOURS**  
**PART-I(MCQS): MAXIMUM 30 MINUTES**

**PART-I (MCQS)**  
**PART-II**

**MAXIMUM MARKS = 20**  
**MAXIMUM MARKS = 80**

**NOTE:**

- i. **Part-II** is to be attempted on the separate **Answer Book**.
- ii. Attempt **ONLY FOUR** questions from **PART-II**, by selecting **TWO** questions from **EACH SECTION**. ALL questions carry **EQUAL** marks.
- iii. All the parts (if any) of each Question must be attempted at one place instead of at different places.
- iv. Write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.
- v. No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.

**SUBJECTIVE PART — PART-II**

**SECTION-A**

- Q. 2.** (a) List and explain three different types of user interfaces. What kind of user interface is implemented in the Apple iPhone? (6)  
(b) Describe any two of the following briefly: ISP, FTP, Neural Network and Cloud Computing. (6)  
(c) Write a detailed note on crypto currency. Also, associate it with non-fungible tokens (NFTs)?(8)

- Q. 3.** (a) Translate the following for loop into a while loop: (4)

```
#include <iostream>

using namespace std;

int main()
{
    k=1;
    for (int i =0; i<10; i++)
    {
        print k+i;
    }

    return 0;
}
```

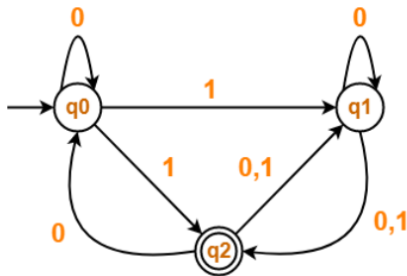
- (b) Write a C++ program that takes a string from the user and prints its reverse. (6)  
(c) Write a C++ program that takes a number from the user and displays whether the number is a prime number or not. (4)  
(d) You have been given the task to code statistics software. The software should take 10 numbers as input from the user and display the sum of the numbers, the mean of the numbers and the standard deviation of the numbers. You can utilize the cmath library for this function. (6)
- Q. 4.** (a) What is the difference between a class and an abstract class? Explain through giving an example of each. (6)  
(b) Define Object-oriented Programming (OOP) and explain how it is better than Procedural Programming. (6)  
(c) You have been given the task to renovate the hospital management system by designing software that utilizes classes. The software should allow patients to make appointments with

doctors. The doctors should be able to view the profiles and histories of the patients. The hospital also keeps track of all the medicines that are in stock in the pharmacy. Define suitable classes and suitable attributes in C++ syntax. Use the public scope resolution operator. You do not have to implement any member procedures. (8)

- Q. 5.** (a) How object encapsulation is different from data abstraction? (6)  
 (b) Hash tables enable for fast insertion and searching within the database. Describe the process of hashing with a suitable example. (8)  
 (c) Describe the process of Bubble Sorting. Write down the output after each pass of the Bubble Sort algorithm for sorting the sequence (4, 8, 22, 6, 1, 12). (6)

**SECTION-B**

- Q. 6.** (a) Convert the following NFA to DFA: (8)



- (b) Differentiate between overloading and overriding with the help of an example. (4)  
 (c) Twitter is a social network that is used to opine regarding current affairs and political climates of different countries. Resultantly, politicians, influencers and opinion-makers end up with millions of followers. Devise an algorithm of Twitter that allows a person to follow all the followers of an influencer that he/she is following. (Hint: a politician profile is associated with the profiles he is following through graphs. (8)
- Q. 7.** (a) Python is a programming language is that generally interpreted whereas C++ programs are compiled through a compiler. What is the difference between a compiler, assembler and an interpreter? (6)  
 (b) Why would you prefer to use arrays over linked lists? (6)  
 (c) Write Abstract Data Types (ADT) of Stack. Include the specifications of Push, Pop, IsEmpty, IsFull functions along with their respective functions. (8)
- Q. 8.** (a) Differentiate between white-box testing, black-box testing and user acceptance testing. (6)  
 (b) What are SRS documents and what contents we should contain in the SRS document? (6)  
 (c) The design methodologies of programs can have multiple approaches including the Xtreme Programming, Code and Fix, Water Fall and the Spiral Model. Consider a test application and describe the development of the application while following each of these four approaches. (8)

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***Best of Luck for CSS-2022***