



National Officers Academy

Mock Exams CSS-2022

March 2022(Mock-8)

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

Question 2

- (a) Discuss what was revised in the BSD 3-clause license. Also name 5 software applications that are currently using this license. (10)
- (b) Describe any two of the following briefly: HTML, Digital Image Processing (DIP), TCP and RISC. (6)
- (c) Write a note on computer crimes and ethical challenges. (4)

Question 3

- (a) Write a program in C/C++ to convert a decimal number to binary number. (8)
- (b) What is the difference between volatile and non-volatile memory? If you were to store company archives, which memory would you prefer to store it at? (8)
- (c) Write a C++ program that takes a number from the user and displays whether the number is divisible by 2 or not. (4)

Question 4

- (a) Explain OOP principles in detail. What will happen if we remove inheritance as a principle? (10)
- (b) How data abstraction is useful? Explain. (4)
- (c) You have been given the task to renovate the campus system of a university by designing software that utilizes classes. The software should allow students to register for courses. It should allow teachers to schedule classes on their own according to their free time. The teachers should also be able to view the profiles of students and give marks for assignments and deliverables. The administration of the university should be able to hire or fire teachers based on the reviews of students. Define suitable classes and suitable attributes in C++ syntax. You do not have to implement any member procedures. (6)

Question 5

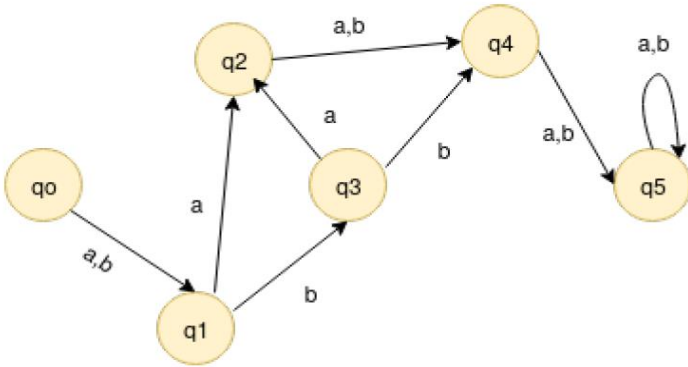
- (a) If there are 300 nested loops, and each loop runs for 100 times, what is the time complexity of this algorithm? (6)

- (b) What is the difference between binary search and linear search? (8)
- (c) Describe the process of Quicksort. What is the time complexity of Quicksort? (6)

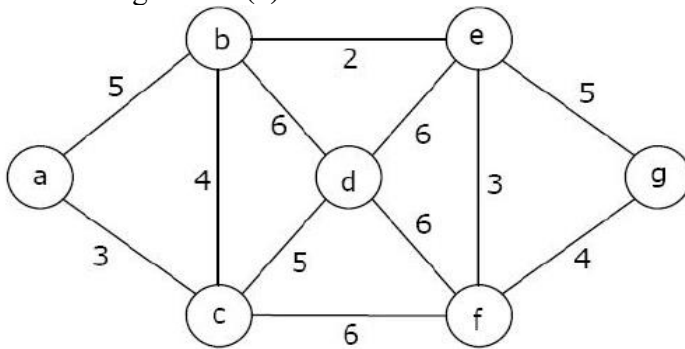
Section B

Question 6

- (a) Create State Transition Table from the following graph: (8)



- (b) Consider the following graph. Find out the sequence of edges added to the minimum spanning tree using Kruskal's algorithm. (8)



- (c) What data structure would you use for searching from a list of numbers? Explain with reasoning. (4)

Question 7

- (a) Explain recursion in detail. Give two examples where recursion is useful. (8)
- (b) When would you prefer to use graphs over linked trees? (6)
- (c) Write Abstract Data Types (ADT) of a Queue and explain with reasoning why the data structure of a Queue is important. (6)

Question 8

- (a) Explain SCRUM, the agile development methodology in detail. (8)
- (b) Agile Development is a process that values responding to change over following a plan. Discuss three issues a Software Engineer should be mindful of when adopting this approach during software development. (6)
- (c) What type of project is not suited to incremental methods? (6)

Best of Luck for CSS-2022