2022

COMPUTER SCIENCE

(General)

Paper Code : III - A & B

(New Syllabus)

Full Marks : 100   Time : Three Hours

Paper Code : III - A

(Marks : 30)

Choose the correct answer.

Each question carries 1.5 Marks.

1. The term PUSH and POP is related to —

    (A) Queue

    (B) Stack

    (C) Both

    (D) None

2. Stack can be implemented using ————————— and ————————— .

    (A) Array and Binary Tree

    (B) Linked List and Graph

    (C) Array and Linked List

    (D) Queue and Linked List

3. Insertion and Deletion operation in Queue is known as —

    (A) Push and Pop

    (B) Enqueue and Dequeue

    (C) Insert and Delete

    (D) None

4. Which of the following principle does queue use ?

    (A) LIFO

    (B) FIFO

    (C) Both

    (D) None of the above

5. How are String represented in memory considering C language ?

   (A) An array of characters

   (B) The object of same class

   (C) Same as other primitive data types

   (D) Linkedlist of characters

6. How is an array initialized in C language ?

   (A) int a[3] = {1, 2, 3}

   (B) int a = {1, 2, 3}

   (C) int a[ ] = new int [3]

   (D) int a(3) = [1, 2, 3]

7. Which of the following is an exit controlled loop ?

   (A) While loop

   (B) For loop

   (C) do-while loop

   (D) None of the above

8. What is the size of the int data type (in bytes) in C for 32-bit compiler ?

   (A) 4

   (B) 8

   (C) 2

   (D) 1

9. When a POP( ) operation is called on an empty stack, what is the condition called ?

   (A) Overflow

   (B) Underflow

   (C) Syntax error

   (D) Garbage value

10. Which of the following function is used to open a file in C ?

   (A) fopen

   (B) fclose

   (C) fseek

   (D) fgets

11. What is the return type of the fopen ( ) function in C ?

  (A) Pointer to a FILE object

  (B) Pointer to an integer

  (C) An integer

  (D) None of the above

12. How to find the length of an array in C ?

  (A) sizeof(a)

  (B) sizeof(a[0])

  (C) sizeof(a) / sizeof(a[0])

  (D) sizeof(a) * sizeof(a[0])

13. Which of the following is not a storage class specifier in C ?

  (A) volatile

  (B) extern

  (C) auto

  (D) static

14. Which of the following should be used to free memory from a pointer allocated using the "malloc()" function ?

  (A) free()

  (B) delete()

  (C) realloc()

  (D) None of the above

15. Which of the following are correct file opening modes in C ?

  (A) r

  (B) rb

  (C) w

  (D) All of the above

16. A translator which reads an entire program written in a high level language and converts it into machine language code is —

  (A) Assembler

  (B) Translator

  (C) Compiler

  (D) System software

17. Find the output of a and b after executing the following C program snippet —

    let a=10, b=15;

    a=a^b;

    b=a^b;

    a=a^b;

    (A) a=10, b=25

    (B) a=15, b=25

    (C) a=15, b=10

    (D) None of the above

18. A program —

    (A) is a device that performs a sequence of operations specified by instructions in memory

    (B) is the device where information is stored

    (C) is a sequence of instructions

    (D) is typically characterized by interactive processing and time of the CPU's time to allow quick response to each user

19. An OS is an —

    (A) Application program

    (B) System program

    (C) Al program

    (D) None of the above

20. PCB stands for —

    (A) Process Control Board

    (B) Program Control Block

    (C) Process Control Block

    (D) None of the above

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Paper Code : III - B

(Full Marks : 70)

The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.

Answer any *five* questions taking at least one at most two questions from each group.

14×5=70

Group - A

1. (a) Write an algorithm to sort a set of numbers using Selection Sort technique. Give an example of it.

   (b) Explain recursion with an example.

   (c) Write down the complexity of the following algorithm

       1. Marge sort 2. Bubble sort.   (4+3)+5+2=14

2. (a) Differentiate between Stack and Queue.

   (b) Explain dynamic memory allocation.

   (c) Write an algorithm that implements Binary Search iteratively.

   (d) Write the advantages of Linked List over an Array.   4+3+5+2=14

3. (a) What is Hashing ? Describe two hashing methods with example.

   (b) What is collision ? Discuss two collision resolution techniques briefly.

       (2+5)+(2+5)=14

Group - B

4. (a) What is critical section in OS ?

   (b) Describe scheduling with examples.

   (c) Describe the necessary contitions for deadlock.   4+5+5=14

5. (a) What is Swapping in OS ?

   (b) What do you mean by paging ? Write two advantages of paging ?

   (c) What is page fault ?

   (d) Briefly discuss about Process Life Cycle ?   4+6+2+2=14

Group - C

6. (a) Write a C program to print the following pattern :

                   1

               1   2

           1   2   3

(b) Write a C function to print out factorial of any input number.

(c) Differentiate between call by value and call by reference.   6+4+4=14

7. Write short notes on any *four* :   3½×4=14

   (a) For loop

   (b) Bit wise operator

   (c) Data Types in C

   (d) Array

   (e) Pointer

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