SRI RAMAJAYAM GLOBAL SENIOR SECONDARY CBSE SCHOOL

Chapter – 6 & 7 (03.09.2020)

STD: XII **TIME: 02.00 Hrs**

SUBJECT: COMPUTER SCIENCE **TOTAL MARKS: 70**

I. Multiple Choice Questions **20x1=20**

1. Recursion is a_____

(a) generic class.
(b) process of setting a value based on its previous value:
(c) process of defining a method that calls itself.
(d) process of repeatedly calling other methods.

2. A function that is called by itself, either directly or indirectly is called as

(a) Super function (b) Recursive function
(c) Main function (d) All of these

3. Iteration uses a repetition/looping structure whereas recursion uses

(a) Sequence structure (b) Selection structure
(c) Looping structure (d) Function call

4. Recursion is heavy on memory as compared to iteration because

(a) There are multiple cases in recursive functions.
(b) There are unfinished function calls lying in memory
(c) Loops consume lesser memory than multiple cases)
(d) Functions can run faster after consuming more memory

5. In a recursive function, the case for which solution is pre-known or computable with an expression is called_____

(a) Recursive case (b) Explicit case
(c) Base case (d) Repetitive case

6. In a recursive function,_____ case must always be reachable.

(a) Recursive case (b) Explicit case
(c) Base case (d) repetitive case

7. In a recursive function, _____ case always invokes another function.

(a) Recursive case (b) Explicit case
(c) Base case (d) repetitive case

8. In a recursive function, if the base case is not reached, what happens?

(a) Program executes and shows 'Syntax error.
(b) Program does not run at all
(c) Program executes the recursive case only once.
(d) Program keeps on executing and 'Out of Memory' or 'Stack overflow' error occurs.

9. Which of the following cannot be converted in a recursive function ?

(a) Factorial program
(b) random function generation
(c) Binary Search
(d) Greatest Common Divisor (GCD)

10. Pick an option to complete the below given code which is computing factorial through a recursive function.

```
def factorial(n):
if n == 0: # Base case
return 1
else:
return
```

(a) n*(n-1) (b) n (c) n* factorial (n-1) (d) factorial(n-1)*n

11. What are the base cases in the following recursive function?

```
def recfunction(n):
if n > 0:
print(n% 10)
recfunction(n // 10)
```

(a) n > 0 (b) n <=0 (c) no base cases (d) n< 0

12. In the following function, what is the base case?

```
def res function (n):
if n == 1:
return 1
else
return on rec function(n - 1)
```

(a) n is 1 (b) n is greater than 1
(c) n is less than 1. (c) no base case.

13. Carefully read the following recursive function and choose one of the given options.

def factorial (n):
return n factorial(n-1)*

(a) Invoking factorial(0) returns 0.
(b) Invoking factorial(1) returns 0.
(c) Invoking factorial(2) returns 2.
(d) The function runs infinitely and causes a StackOverflowError.

14. Algorithm efficiency is estimated to _____
(a) Determine the exact execution time
(b) Calculate the approximate execution time
(c) Determine the growth function with input size
(d) All of these

15. On the best case, linear search searches
(a) the whole list (b) half of the list
(c) Just one element in the list (d) One fourth of the list

16. On the worst case, linear search searches
(a) the whole list (b) half of the list
(c) Just one element in the list (d) One fourth of the list

17. On an average linear search searches
(a) the whole list (b) half of the list
(c) just one element in the list (d) one fourth of the list

18. Worst Case efficiency means that
(a) The highest execution time of the algorithm
(b) It tells that the algorithm will never be slower than the worst case.
(c) It estimates the worst execution time the algorithm may take
(d) None of these

19. Best Case efficiency means that
(a) The fastest possible case of the algorithm
(b) It tells that the algorithm will never be slower than the worst case.
(c) It estimates the best execution time the algorithm may take.
(d) None of these

20. Average Case efficiency means that
(a) The fastest possible case of the algorithm
(b) It tells that the algorithm will never be slower than the worst case,
(c) Most probable cases of the algorithm will perform like this
(d) None of these

II. Fill in the Blanks **10x1=10**

21. A function is said to be_____ if it calls itself.
22. The_____ Case in a recursive program must be reachable.
23. Every recursive function consists of one or more base cases and a general, _____ case.
24. When a recursive function calls itself endlessly, it is called_____
25. In a recursive function, the case with a determinable solution is called _____ _____.
26. The recursive solution of a problem consumes _____ memory than the iterative solution of the problem.
27. Infinite recursion occurs when_____ case is not reached at all.
28. The measure of the efficiency of an algorithm is called algorithm's computational _____
29. Programs with a bigger O notation value run_____ than programs with a smaller O notation value.
30. _____term affects the most, an algorithm's performance.

III. Answer in one word Questions **5x1=5**

31. Array for binary search should be sorted or not?
32. When is recursion endless?
33. Is it necessary to have a base case in a recursive function?
34. Which factors affect an algorithm’s performance?
35. Is linear search or binary search faster?

IV. Glossary (Definition) **5x2=10**

36. Recursion
37. Average-case complexity
38. Base-case and Recursive-case
39. Complexity
40. Worst- case complexity

V. Answer the following Questions **10X2=20**

41. What is direct recursion and indirect recursion?

42. How can you stop/resolve an infinite recursion?

43. Give some examples that can be represented recursively?

44. Difference between iteration and recursion.

45. Write recursive code to compute the factorial of an integer.

46. Define Big 'O' notation

47. Reorder the following efficiencies from the smallest to the largest:

    a)10000 b)n! c) n2 d)nlogn

48. What are different types of complexities that are considered?

49. Given the following array, which search will find the value 18 in least steps?

    3 10 18 22 35

50. Explain: Time, Space, Speed and Quality.

VI. Answer the following Questions **5**

51. (a) What are the advantage and disadvantage of recursion? (3)

    (b) Find the output of following program (2)

```
def out(n):
if(n==0):
return
else:
out(n-1)
print(n)
n=6
out(n)
```

*****All the Best*****