

OR

16535(D) - 0 DEC 2016

MCA 2nd Semester Examination
Object Oriented Programming &
Data Structures Using Java (CBS)

MCA-201/MCA-C21

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all. Question no. 9 in section E is compulsory. Rest attempt one question from the sections A, B, C & D.

SECTION - A

1. (a) Java follows write once run anywhere approach. Discuss. (2)
- (b) Write a program in Java to convert a binary number to a decimal number. (3)
- (c) Write a program in Java to remove the duplicate values from an array. (5)

OR

2. (a) Write a program in Java to illustrate method overloading. (6)
- (b) Discuss with a program how a class promote data hiding and encapsulation. (4)

SECTION - B

3. (a) What are the steps for creating your own package? Discuss. (5)
- (b) Write a program in Java that prints the number of characters, words and lines in a file. (5)

4. (a) Write a program to illustrate thread synchronization. (4)
- (b) Differentiate between interface and abstract class in Java. (3)
- (c) What is the difference between this() and super(). (3)

SECTION - C

5. Write a program to illustrate Tower of Hanoi. Calculate its time and space complexity. (10)

OR

6. (a) Write a program to reverse a single linked list. (6)
- (b) What is the need of circular queue? Discuss. (4)

SECTION - D

7. (a) Find out the complexity of the below recurrence:

$$T(n) = \begin{cases} 4T(n-1), & \text{if } n > 0 \\ 1 & , \text{ otherwise} \end{cases} \quad (6)$$

- (b) If $f(n)=2n-2$ and $g(n)=n$ then prove that $f(n)=O(g(n))$ (4)

OR

8. Write a program to sort a random array using Quick sort. Find its complexity also. (10)

SECTION - E

9. Explain the following:
 - (a) Final modifier
 - (b) AWT
 - (c) Byte Code
 - (d) Super class constructor
 - (e) Wrapper class
 - (f) Sparse array
 - (g) Priority Queue
 - (h) B-tree
 - (i) Deque
 - (j) Theta notation.

(2×10=20)