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12-00-2-03

MASTER OF COMPUTER APPLICATIONS DEGREE EXAMINATION — NOVEMBER 2020

SECOND SEMESTER

MCA 202 — DATA STRUCTURES USING JAVA

(Under C.B.C.S. Revised New Regulations w.e.f. 2016-2017)

(Common paper to University and all Affiliated Colleges)

(Regular/supplementary)

Time : 3 hours Max. Marks : 80

SECTION – A

(Compulsory)

Answer any FIVE of the following questions, Each questions carries 4 marks.

(Marks : 5 × 4 = 20)

1. (a) Determine the frequency counts for all the statements in the following - algorithm: $S = 0$; For $i = 1$ to n do $S = S + a[i]$; output S.

(b) What are the advantages of linked list?

(c) Represent the following expression as a binary tree structure: $(a \times b)/c((f + d) - e)$

(d) What are the possible ways to represent the graph?

(e) Write a note on Red-Black Trees.

(f) What is Binary heap? Give an example.

(g) Write a Java Program to implement the insertion sod.

(h) What is the average and worst case of poly phase merge sort?

(i) Implement the Linear Search using Java Code.

(j) How can you handle overflow?

SECTION – B

Answer FIVE questions, choosing ONE question from each unit.
Each question carries 12 marks.

(Marks : 5 × 12 = 60)

UNIT – I

2. Classify the rate of growth of an algorithm and explain.

Or

3. (a) How the stack is useful to evaluate the expression?

(b) What is queue? Describe the operations associated with queue.

[P.T.O.]

UNIT – II

4. How can you represent the set as a Tree? What are the operations that can be performed on these sets? How these operations are implemented?

Or

5. Describe the graph search strategies and BSF and DFS.

UNIT – III

6. Explain AVL rotations with an example.

Or

7. The top-down splay trees are faster than bottom-up splay trees by a constant factor. Justify the above statement.

UNIT – IV

8. Explain the quick-sort procedure with the following data. Also develop a program using Java for the same. 65, 70, 75, 80, 85, 60, 55, 50, 45 .

Or

9. *Illustrate* and explain the procedure for sorting with tapes.

UNIT – V

10. Describe the binary search procedure with an example. Also write the *java program for* the same.

Or

11. Describe the pros and cons of cylinder surface indexing.
