# CHRIST UNIVERSITY,BENGALURU - 560029

**End Semester Examination March - 2015**

**Bachelor of Science II SEMESTER CME / CMS**

**Code: CSC231** **Max.Marks: 100**

**Subject: DATA STRUCTURES AND OPERATING SYSTEMS** **Duration: 3Hrs**

## SECTION A

**Answer all the questions** **10X2=20**

**1** Write the formula to get the address of any element of a linear array.

**2** Write the differences between malloc() and calloc().

**3** Give the syntax of calloc().

**4** Convert the following infix expression into its equivalent postfix expression:

(a) (A+B)/(C-D)*E

(b) A*B+C/D

**5** What is postorder traversal?

**6** What are the tasks of bootstrap programs?

**7** How do independentt processes communicate with each other?

**8** Define mutual exclusion.

**9** Define virtual memory.

**10** What do you mean by simple record structure of a file?

## SECTION B

**Answer any eight questions** **8X5=40**

**11** Write a note on the operation of inserting an element into one dimensional array.

**12** Explain dynamic memory allocation in C.

**13** Write a note on infix and prefix expressions with suitable examples.

**14** Explain the sequential representation of binary trees in memory.

**15** Trace selection sort algorithm for the following set of numbers:

20 100 10 -2 -5 150 2 90

**16** Kernel is called as heart of the operating system. Justify.

**17** Explain shortest job first algorithm.

**18** Explain the system model used by processes for utilizing resources.

**19** Write a note on memory protection.

**20** List and explain the different attributes of a file.

## SECTION C

**Answer any two questions** **2X10=20**

**21** Write a program to perform matrix addition and subtraction.

**22** Write a program to implement stack using linked list.

**23** Write a program to implement bubble sort.

## SECTION D

**Answer any two questions** **2X10=20**

**24** Explain critical section problem in detail with its solution for two processes.

**25** (a) Differentiate between deadlock prevention and deadlock avoidance.

(b) Explain deadlock avoidance in detail.

**26** With a neat diagram, explain the structure of a page table. Explain the significance of a page table in memory management.