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**Mid-Semester Examination October 2024**
**Department of Computer Science**
**(Faculty of Mathematical Sciences)**
**University of Delhi, Delhi-110007**

**MCAC 101: Object Oriented Programming**

**Max Marks:30** **Time: 1 Hour**

**Notes:**

1. Marks will be given only if you stick to the programming methodology discussed in the class.
2. Restrict to the programming features covered in the class.
3. Make suitable assumptions, if required.

1. Write a C++ program to write to an output text file comprising all appointments in a given fortnight (first fortnight: day 01 to day 15, second fortnight: day 16 onwards) of a month. The information about fortnight, month, and year should be taken from the user. Assume that the appointment data is available in a text file. Further, assume that all appointments relate to the years 2022 to 2047. Ignore appointments that relate to invalid dates or times. Assume that the appointments follow the following structure on a single line: **(10)**

   Date: (dd mm yyyy), separated by blanks, followed by: Time: (hours minutes), separated by blanks, followed by purpose: text.
   **Examples** (note that appointments do not appear in chronological order):
   01 01 2025 10 00 New Year celebrations
   29 02 2024 13 00 Visit to Rashtrapati Bhawan

2. **For full credit:** Write a recursive function to count the number of occurrences of a value in a vector. Show the run-time stack for the vector: 30 20 30 40 30 **(12)**

   **For partial credit:** (Do not attempt this if you have attempted the above part). Use iteration to write a function to count the number of occurrences of a value in a vector. **(5)**

3. **For full credit:** Write a recursive function to check whether a given vector is sorted in ascending order. **(8)**
   **For partial credit:** (Do not attempt this if you have attempted the above part). Write an iterative function to check whether a given vector is sorted in ascending order. **(4)**