Problems on Dates

1. **Odd Days**
   Number of days more than the complete weeks are called odd days in a given period
2. **Leap Year**
   A leap year has 366 days.
   In a leap year, the month of February has 29 days

a. Every year divisible by 4 is a leap year, if it is not a century.
   Examples:
   1952, 2008, 1680 etc. are leap years.
   1991, 2003 etc. are not leap years

b. Every 4th century is a leap year and no other century is a leap year.
   Examples:
   400, 800, 1200 etc. are leap years.
   100, 200, 1900 etc. are not leap years

3. **Ordinary Year**
   The year which is not a leap year is an ordinary year.
   An ordinary year has 365 days

4. **Counting odd days and Calculating the day of any particular date**

I. 1 ordinary year ≡ 365 days ≡ (52 weeks + 1 day)
   Hence number of odd days in 1 ordinary year= 1.

II. 1 leap year ≡ 366 days ≡ (52 weeks + 2 days)
   Hence number of odd days in 1 leap year= 2.

III. 100 years ≡ (76 ordinary years + 24 leap years)
   ≡ (76 x 1 + 24 x 2) odd days
   ≡ 124 odd days.
   ≡ (17 weeks + 5 days)
   ≡ 5 odd days.
   Hence number of odd days in 100 years = 5.

IV. Number of odd days in 200 years = (5 x 2) = 10 ≡ 3 odd days

V. Number of odd days in 300 years = (5 x 3) = 15 ≡ 1 odd days

VI. Number of odd days in 400 years = (5 x 4 + 1) = 21 ≡ 0 odd days
   Similarly, the number of odd days in all 4th centuries (400, 800, 1200 etc.) = 0. That means we close every 4^{th} Century on a Sunday. Every new 4^{th} Century begins on a Monday.

VII. Mapping of the number of odd day to the day of the week

Number of Odd Days	:	0	1	2	3	4	5	6
Day of the week	:	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

Last day of a century can be Monday, Wednesday, Friday or Sunday. Last day of a century cannot be Tuesday or Thursday or Saturday.

1. For the calendars of two different years to be the same, the following conditions must be satisfied.

a)Both years must be of the same type. i.e., both years must be ordinary years or both years must be leap years.

b)1^{st} January of both the years must be the same day of the week.

1. How many days are there from 2^{nd} January, 1995 to 15^{th} March 1995
2. How many days are there from 15^{th} December, 1998 to 10^{th} June, 1999
3. Today is Friday. What day will it be after 62 days ?
4. Today is Sunday. What day will it be after 93 days ?
5. January 1, 1973 was Sunday. What day of the week lies on January 1, 1974 ?
6. February 8^{th} 1995 was Wednesday. What day of the week lies on Feb 8^{th} 1996?
7. February 8^{th} 1996 was Friday. What day of the week lies on February 8^{th} 1997?
8. January 1^{st} 1992 was Wednesday. What day of the week was on January 1^{st} 1993?
9. What day of the week does May 28 2006 fall on

   A. Saturday B. Monday C. Sunday D. Thursday
10. What will be the day of the week 15th August, 2010?

    A. Thursday B. Sunday C. Monday D. Saturday
11. Today is Monday. After 61 days, it will be

    A. Thursday B. Sunday C. Monday D. Saturday
12. On what dates of April, 2001 did Wednesday fall?

A. 2^{nd}, 9^{th}, 16^{th}, 23^{rd} B. 4^{th}, 11^{th}, 18^{th}, 25^{th} C. 3^{rd}, 10^{th}, 17^{th}, 24^{th} D. 1^{st}, 8^{th}, 15^{th}, 22^{nd}, 29^{th}

13. How many days are there in x weeks x days

    A. $14x$ B. $8x$ C. $7x^2$ D. 7
14. The calendar for the year 2007 will be the same for the year

    A. 2017 B. 2018 C. 2014 D. 2016
15. Which of the following is not a leap year?

    A. 1200 B. 800 C. 700 D. 2000
16. The last day of a century cannot be

    A. Monday B. Wednesday C. Tuesday D. Friday