Calendar

There are 12 months in 1 year.

Jan –31 (days), Feb –28; 29 (for a leap year), Mar –31, Apr – 30, May –31,

June – 30; July – 31; Aug – 31; Sept –30; Oct – 31; Nov –30; Dec – 31.

Total 365 (ordinary year); 366 days (for a leap year)

To find the number of weeks in an ordinary year:

$\frac{365}{7}$ = 52 weeks + 1 odd day (remainder)

To find the number of weeks in a leap year:

$\frac{366}{7}$ = 52 weeks + 2 odd days (remainder)

Leap year: It is so called as it comes after a leap of 3 years from the previous leap year.

Leap Year

Method to find whether a given year is a leap year or an ordinary year.

Every year which is not a century year (i.e. which is not a multiple of 100) is a leap year if and only if it is completely divisible by 4.

Every century year is a leap year if and only if it is completely divisible by 400 or is an integral multiple of 400 (i.e. the remainder ought to be 0).

e.g. 2000 is a leap year.

1900 is not.

1996 is a leap year, 1998 is not.

Odd day's concept

To find the number of odd days in a century

A century, i.e. 100 year has 76 ordinary year and 24 leap year.

= [(76 $\times$ 52) weeks + 76 days] – [(24 $\times$ 52) weeks + 24 $\times$ 2 days]

= 5200 weeks + 124 days

= 5200 weeks + 17 weeks + 5 odd days

= 5217 weeks + 5 odd days

Therefore, 100 years contain 5 odd days.

Now, (i) 200 years contain 5 $\times$ 2 = 10, i.e., 3 odd days.

(ii) 300 years contain 5 $\times$ 3 = 15 i.e., 1odd day.

(iii) 400 years contain 5 $\times$ 4 + 1 = 21, i.e., no odd day.

Similarly, 800, 1200 years etc. contain no odd day.

Note: (i) $5 \times 2 = 10$ days = 1 week + 3 days i.e., 3 odd days

(ii) $5 \times 3 = 15$ days = 2 weeks + 1 day i.e. 1 odd day.

(iii) 400^{th} year is a leap year therefore one additional day is added.

Odd days and their numeral values

When we have to calculate the number of days on any particular Extra Days and their numeral Values

0 → Sunday

1 → Monday

2 → Tuesday

3 → Wednesday

4 → Thursday

5 → Friday

6 → Saturday

Ex.5 ***Father of Nation Mahatma Gandhi died on 30th January 1948. What was the day on which he died?***

Sol. Up to 1600 AD we have 0 odd days, up to 1900 AD we have 1 odd day. Now for in 47 years we have 11 leap years and 36 normal years.

Odd days from 1901 to 1947 = 11 x 2 +36 x1 = 22 + 36 =58 odd days

= 8 weeks + 2 odd days

Total odd days up to 31^{st} December 1947 = 1 + 2 = 3 odd days

30 days of January contain only 4 weeks + 2 odd days

So 30^{th} January 1948 has total 5 odd days

Day on 30^{th} January 1948 = Friday.

Ex.6 How does the number of odd days help us in finding the day of a week? (Please take care of this point)

When a specific day is given:

Suppose a question like: Jan 1, 1992 was Wednesday. What day of the week will it be on Jan 1, 1993? If you recall, 1992 being a leap year it has 2 odd days. So, the above said day will be two days beyond Wednesday, i.e., it will be Friday.

When no specific day is given:

Here, we count days according to number of odd days.

Sunday for 0 odd day, Monday for 1 odd day and so on. (i.e. from 0 to 6; 6 being Saturday)

Suppose someone asks you to find the day of the week on 12th January 1979.

12th Jan, 1979 means 1978 year + 12 days

Now, 1600 years have 0 odd day.

300 years have 1 odd day

78 years have 59 ordinary year + 19 leap years = 6 odd days.

Total no. of odd days = 0 + 1 + 6 + 12 = 19 or 5 odd days. So, the day was "Friday"

Know Me

An easy way to remember no. of odd days per month are 30 32 32 33 23 23. Where 0 represents the no. of odd days in February if it is not a leap year. If it is a leap year take it as 1.

Points not to be ignored:

1. 400th year is a leap year or a century multiple of 400 is a leap year, rests are not.
2. 100 years has 5 odd days
   200 years has 3 odd days
   300 years has 1 odd day
   400 years has 0 odd days. And so on