

CALENDAR

Aptitude Shortcuts



CALENDAR PROBLEMS

By-Rahul Agrahari

CONCEPT

365 Days , 5 Hr , 48 Minutes ,11 Seconds

INTRODUCTION

The questions on this topic are very common in in various competitive exams. The method of solving such questions lies in the concept of obtaining the number of **odd days**.

Before jumping to the topic, let us discuss review some of the basic concept

- Whenever the number of year is exactly divisible by 4(except the century year), then it is a leap year.
- Whenever the number of year is not divisible by 4 then it is an ordinary year.
- In case of a centaury year if the number of year is exactly divisible by 400, then it is a leap year.

Century year

A year is a century year if it is
divisible by 100

Non-Century year

A year is a non-century year if it
is not a century year

Leap year

A year is a leap year if it is a non century year that is divisible by 4, or a century year that is divisible by 400.

Examples:

1952, 2008, 1680 etc. are leap years.

1991, 2003 etc. are not leap years

400, 800, 1200 etc. are leap years.

100, 200, 1900 etc. are not leap years

Counting odd days and calculating day of any particular date

1 ordinary year \equiv 365 days \equiv (52 weeks + 1 day)

Hence number of odd days in 1 ordinary year = 1.

1 leap year \equiv 366 days \equiv (52 weeks + 2 days)

Hence number of odd days in 1 leap year = 2.

100 years \equiv (76 ordinary years + 24 leap years)

$= (76 \times 1 + 24 \times 2)$ odd days

$= 124$ odd days.

$= (17 \text{ weeks} + 5 \text{ days})$

$= 5$ odd days.

CONCEPT

100 years----- $5 \times 1 = 5$ (odd days)

200 years----- $5 \times 2 = (10 \text{ days})/7 = 3$ (odd days)

300 years----- $5 \times 3 = (15 \text{ days})/7 = 1$ (odd days)

400 years----- $5 \times 4 = (20+1 \text{ days})/7 = 0$ (odd days)

800 years----- = 0 odd days

1200 years----- = 0 odd days

1600 years----- = 0 odd days

2000 years----- = 0 odd days

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

No. of odd days	1	2	3	4	5	6	7 or 0
Days	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.

2. In an ordinary year the calendar for the month of January is same as the calendar for the month of October.

In short in an ordinary year January=October

3. In a leap year the calendar for the month of January is same as the calendar for the month of July.

in short January = July

REMEMBER

Odd days

- Non leap year – 1
- Leap year – 2
- 100 years – 5
- 200 years – 3
- 300 years – 1
- 400 years - 0

Day

- Sunday – 0
- Monday – 1
- Tuesday – 2
- Wednesday – 3
- Thursday – 4
- Friday – 5
- Saturday - 6

On which week day August 15, 1947 falls?

Ans: We know that odd days up to 1600 years are zero.

For the years 1601 to 1700 there exist 5 odd days, 1701 to 1800 there exist 5 odd days, 1801 to 1900 there are another 5 odd days. So up to 1900 there are 15 odd days or 1 odd day

Now from 1901 to 1946 there are 11 leap and 36 non leap years. So number of odd days for these 46 years will be $11 \times 2 + 35 \times 1 = 57$. After dividing this with 7 we get 1 odd day.

Now we entered into year 1947. January contains 3 odd days, February 2, march 3, April 2, may 3, June 2, July 3, august 15 = $3 + 0 + 3 + 2 + 3 + 2 + 3 + 15 = 31 = 3$ odd days

So total odd days = $1 + 1 + 3 = 5$

If odd days are 0 then it is Sunday, 1 Monday,..... so It is Friday

28-MAY-2020

QUESTION

What was the day on 28 May 2006?

(a) Wednesday

(b) Sunday

(c) Saturday

(d) Thursday

EXPLANATION

28th May, 2006.

In 400 years \rightarrow '0' odd days

In 200 years \rightarrow '0' odd days

2001 to 2005 $\rightarrow 4 \times 1 + 1 \times 2 = 6$

Jan — 31 Days — "3" odd days

Feb — 28 " — "0" O.D.

Mar — 31 " — "3" O.D.

Apr — 30 " — "2" O.D.

May — 28 " — "0" O.D.

8 O.D.

O.D. = $8 + 6 = 14 \rightarrow 0$ (zero). O.D.

QUESTION

Q:- What was the day on 17 June 1998?

(a) Wednesday

(b) Monday

(c) Sunday

(d) Friday

EXPLANATION

June 17, 1998

+300
1600 years \rightarrow 0 O.D
1900 years \rightarrow 1 O.D

1901 - 1997 \rightarrow 97 years

= 24 Leap years + 73 Non leap year

= $24 \times 2 + 73 \times 1$

= 121 days = 2 O.D.

Year 98,

Jan - 3

Feb - 1

Mar - 3

Apr - 2

May - 3

June - 3

15 \rightarrow 1 O.D

Total O.D = $2 + 1 = 3 \Rightarrow$ Wednesday

QUESTION

Q:- It was Tuesday on 8 February 2005. What was the day of the week on 8 February 2004?

- (a) Monday**
- (b) Thursday**
- (c) Friday**
- (d) Sunday**

QUESTION

Q:- If it was Thursday on 15 August 2012, then what was the day on 11 June 2013?

- (a) Wednesday**
- (b) Monday**
- (c) Saturday**
- (d) Tuesday**

QUESTION

Q:- If 10 May 1997 was a Monday, What was the day on 10 October 2001?

(a) Saturday

(b) Thursday

(c) Sunday

(d) Friday

QUESTION

Q:- Tuesday fell on which of the following dates of April 2002?

- (a) 3rd, 10th, 17th, 24th,**
- (b) 1st, 8th, 15th, 22nd, 29th,**
- (c) 4th, 11th, 18th, 25th,**
- (d) 2nd, 9th, 16th, 23rd, 30th,**

QUESTION

Q:- Pinky was born on 29th Feb. 2016 which happened to be a Monday. If she lives to be till 2099, how many birthdays would she celebrate on a Monday?

- (a) 1**
- (b) 2**
- (c) 3**
- (d) 5**

EXPLANATION

- **Sol : Option B**

29th Feb, 2016 = Monday => 28th Feb, 2012 = Sunday

28th Feb, 2017 = Tuesday (because 2016 is a leap year, there will be 2 odd days)

Therefore» Feb 28th 2018 (Wednesday), Feb 28th 2019 (Thursday), Feb 28th 2020 (Friday), Feb 29th 2020 (Saturday)

Or, Feb 29th to Feb 29th after 4 years, we have 5 odd days.

So, every subsequent birthday, would come after 5 odd days.

2020 birthday – 5 odd days

2024 birthday – 10 odd days = 3 odd days

2028 birthday – 8 odd days = 1 odd day

2032 birthday – 6 odd days

2036 birthday – 11 odd days = 4 odd days

2040 birthday – 9 odd days = 2 odd days

2044 birthday – 7 odd days = 0 odd days. So, after 28 years, his birthday would fall on Monday.

The next birthday on Monday would be in year 2072 (further 28 years later), the one after that would be in year 2100. But we are told that she lives up to year 2099.

So, there are 2 occurrences of his birthday falling on Monday – 2044 & 2072.

Thank
you

