LF LearnFrenzy

QUANTITATIVE APTITUDE · FREE STUDY MATERIAL

Calendar

Formulas & Shortcut Tricks

Every important formula, shortcut and exam trick for Calendar in one place – with solved examples, common mistakes and a one-page revision sheet.

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USEFUL FOR

- SSC CGL / CHSL / MTS
- Railways (RRB NTPC, Group D)
- Bank PO & Clerk (IBPS, SBI, RBI)
- Campus placements (TCS, Infosys, Wipro, Accenture)
- UPSC CSAT & state PSC exams

Practise Calendar free on LearnFrenzy – questions with instant explanations →

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1 Topic introduction

What it is, why it matters and how it is asked

Calendar questions ask which day of the week a date falls on, or how the days shift from one date to another. The key idea is the odd day: the number of days left over after removing complete weeks. Only odd days change the weekday, so all calculations are done with remainders when dividing by 7.

Learn the odd days in a year, a century and each month, plus the leap-year rule, and you can find the weekday of any date, shift a known day forwards or backwards, and tell which years share the same calendar.

Why it matters in exams

- SSC, railway and bank papers ask 1–2 calendar questions in reasoning or arithmetic.
- Placement tests use “day after n days”, repeating calendars and famous dates.
- The method is mechanical, so marks are almost guaranteed with practice.

Where it is used

- Planning schedules and counting weekdays.
- Finding the weekday of birthdays and historical events.
- Reusing old calendars – which year matches this one?

Common question patterns

Odd days
Odd days in a period of years or a century.

Leap years
Is a given year a leap year?

Day of a date
Weekday of any date, including famous ones.

Shifting
Known day → the same date in another year or after n days.

Repeating calendars
Which year has the same calendar as this one?

Counting weekdays
How many Sundays (or Mondays) in a year or month.

Century days
First and last day of a century.

Big-power days
Day after 2^{20} or 3^{12} days.

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2 Important formulas

Cards marked MOST USED are the ones to revise first

Odd days and leap years

Odd days

MOST USED

> **Odd days = number of days ÷ 7, remainder; ordinary year = 1 odd day, leap year = 2 odd days**

365 = 52 weeks + 1 day; 366 = 52 weeks + 2 days.

EXAMPLE 100 days = 14 weeks + 2 days → **2 odd days**.

Leap-year rule

MOST USED

> **Divisible by 4 → leap, except century years, which must be divisible by 400**

1900 was not a leap year; 2000 was.

EXAMPLE 2100 is a century year not divisible by 400 → **not a leap year**.

Odd days in centuries

MOST USED

> **100 years → 5; 200 years → 3; 300 years → 1; 400 years → 0 odd days**

Every 400 years the calendar repeats exactly.

EXAMPLE 1,000 years = 2 × 400 + 200 → **3 odd days**.

Months

Month	Days	Odd days	Month	Days	Odd days
January	31	3	July	31	3
February	28 / 29	0 / 1	August	31	3
March	31	3	September	30	2
April	30	2	October	31	3
May	31	3	November	30	2
June	30	2	December	31	3

Weekday codes used below: Sunday 0, Monday 1, Tuesday 2, Wednesday 3, Thursday 4, Friday 5, Saturday 6.

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Finding and shifting days

Weekday of any date

MOST USED

> **Total odd days = (complete centuries) + (remaining complete years) + (complete months of the year) + (date); weekday = total ÷ 7 remainder**

Count everything up to the date from the start of the calendar.

EXAMPLE 15 August 1947 → 1,600 y: 0, 300 y: 1, 46 y (11 leap): 57 → 1, Jan–Jul 1947: 2, date 15 → 1 → total 5 → **Friday**.

Same date in the next year

MOST USED

> **Moves forward 1 day, or 2 days if 29 February falls in between**

From a date in March onwards, check whether the next year is a leap year.

EXAMPLE 1 January 2025 was a Wednesday → 1 January 2026 is a **Thursday**.

Day after n days

> **Move forward by (n ÷ 7 remainder) days**

Complete weeks bring you back to the same day.

EXAMPLE Today is Wednesday → after 100 days (2 odd days) it is **Friday**.

Repeating calendars and counts

Years with the same calendar

MOST USED

> **Two years match when 1 January is the same weekday and both are (or are not) leap years; a leap year repeats after 28 years**

Keep adding odd days until the total is a multiple of 7, checking the leap status.

EXAMPLE 2024 (leap, starts Monday) repeats in **2052**.

53 of a weekday

> **Ordinary year: 53 of the weekday of 1 January; leap year: 53 of the weekdays of 1 and 2 January**

The extra one or two days beyond 52 weeks decide it.

EXAMPLE 2024 began on a Monday (leap) → it had 53 Mondays and 53 **Tuesdays**.

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3 Shortcut tricks & smart techniques

Each trick says when to use it – that matters as much as the trick

Use a known anchor date

MOST USED

USE WHEN A date close to the one asked has a known weekday.

1. Count the days between the two dates.
2. Take the remainder on division by 7 and move forwards or backwards.

EXAMPLE 1 March 2025 was a Saturday → 1 March 2026 (365 days later, 1 odd day) is a **Sunday**.

Doomsday dates

MOST USED

USE WHEN Finding any date in a year quickly.

1. 4/4, 6/6, 8/8, 10/10, 12/12 and the last day of February fall on the same weekday every year.
2. Find that weekday once, then step to the date you need.

EXAMPLE In 2026 the last day of February is a Saturday → 6 June 2026 is also a **Saturday**.

Repeating-calendar rule of thumb

USE WHEN Which year has the same calendar?

1. Leap year → +28 years.
2. Ordinary year → usually +6 or +11 years; confirm by adding odd days to a multiple of 7 and checking the leap status.

EXAMPLE 2026 (ordinary) has the same calendar as **2037** (+11).

Big-power days

USE WHEN "What day is it after 2^{20} days?"

1. Find the power's remainder on division by 7 using cycles: $2^3 \equiv 1$, $3^6 \equiv 1 \pmod 7$.
2. Move forward by that remainder.

EXAMPLE Monday + 2^{20} days: $2^{20} = 2^{18} \times 4 \equiv 4$ → **Friday**.

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4 Solved examples

The full method on the left, the exam shortcut on the right

1 ODD DAYS

How many odd days are there in 1,000 years?

STEP BY STEP

1. 1,000 years = 400 + 400 + 200 years.
2. 400 years → 0 odd days each; 200 years → 3.
3. Total = 3 odd days.

SHORTCUT

Remove multiples of 400; 200 years leave 3 odd days.

Why it works: The calendar repeats every 400 years, so only the extra 200 years count.

Answer: 3

2 LEAP YEAR

Is 2100 a leap year?

STEP BY STEP

1. 2100 is divisible by 4 but is a century year.
2. Century years must be divisible by 400; 2100 is not.
3. So 2100 is not a leap year.

SHORTCUT

Century rule: 2100 ÷ 400 is not whole → no.

Why it works: The extra rule keeps the calendar in step with the solar year.

Answer: No

3 FAMOUS DATE

On which day of the week was 26 January 1950?

STEP BY STEP

1. 1,600 years: 0; next 300: 1; 49 years (12 leap): 61 → 5.
2. January 1950 up to the 26th: 26 → 5.
3. Total 0 + 1 + 5 + 5 = 11 → 4 → Thursday.

SHORTCUT

Count odd days and reduce by 7 at each step.

Why it works: Remainders keep the numbers small at every stage.

Answer: Thursday

4 HISTORIC DATE

What day of the week was 2 October 1869?

STEP BY STEP

1. 1,600 years: 0; 200 years: 3; 68 years (17 leap): 85 → 1.
2. Jan–Sep 1869: 3 + 0 + 3 + 2 + 3 + 2 + 3 + 3 + 2 = 21 → 0; date 2 → 2.
3. Total 3 + 1 + 0 + 2 = 6 → Saturday.

SHORTCUT

Centuries + years + months + date, all mod 7.

Why it works: February 1869 had 28 days because 1869 is not a leap year.

Answer: Saturday

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5 NEXT YEAR

1 March 2025 was a Saturday. What day is 1 March 2026?

STEP BY STEP

1. Between the two dates there is no 29 February (2026 is not leap).
2. 365 days → 1 odd day.
3. Saturday + 1 = Sunday.

SHORTCUT

+1 day for an ordinary year.

Why it works: Only an intervening 29 February adds a second odd day.

Answer: Sunday

6 AFTER N DAYS

Today is Wednesday. What day will it be after 100 days?

STEP BY STEP

1. 100 = 14 × 7 + 2.
2. Wednesday + 2 = Friday.

SHORTCUT

100 mod 7 = 2 → Friday.

Why it works: Full weeks return to the same day.

Answer: Friday

7 SAME CALENDAR

Which is the next year with the same calendar as 2026?

STEP BY STEP

1. Add odd days year by year: 2026 (1), 2027 (1), 2028 (2), 2029 (1), 2030 (1), 2031 (1), 2032 (2), 2033 (1), 2034 (1), 2035 (1), 2036 (2).
2. Total = 14 ≡ 0 and 2037 is not a leap year.
3. Answer: 2037.

SHORTCUT

Ordinary year after a leap-year gap → +11 here.

Why it works: Both the starting weekday and the leap status must match.

Answer: 2037

8 LEAP-YEAR CALENDAR

Which is the next year with the same calendar as 2024?

STEP BY STEP

1. A leap year repeats only after 28 years.
2. 2024 + 28 = 2052.

SHORTCUT

Leap year → +28.

Why it works: 28 years contain exactly 7 leap years and a multiple of 7 odd days.

Answer: 2052

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9 COUNTING WEEKDAYS

1 January 2026 is a Thursday. How many Thursdays are there in 2026?

STEP BY STEP

1. 2026 is an ordinary year: 52 weeks + 1 day.
2. The extra day is the weekday of 1 January – Thursday.
3. So there are 53 Thursdays.

SHORTCUT

Ordinary year → 53 of the starting weekday.

Why it works: Every weekday occurs 52 times, plus one extra.

Answer: 53

10 LAST DAY OF THE YEAR

If 1 January 2026 is a Thursday, what day is 31 December 2026?

STEP BY STEP

1. An ordinary year has 364 days after 1 January = 52 weeks.
2. So 31 December is the same weekday as 1 January.
3. Thursday.

SHORTCUT

Ordinary year: last day = first day.

Why it works: 364 is a multiple of 7.

Answer: Thursday

11 BIG POWER

Today is Sunday. What day will it be after 3^{12} days?

STEP BY STEP

1. $3^6 = 729 = 104 \times 7 + 1 \rightarrow 3^6$ leaves remainder 1.
2. $3^{12} = (3^6)^2$ leaves remainder 1.
3. Sunday + 1 = Monday.

SHORTCUT

$3^6 \equiv 1 \pmod 7 \rightarrow 3^{12} \equiv 1 \rightarrow$ Monday.

Why it works: Only the remainder on division by 7 matters.

Answer: Monday

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5 Important exam tips

Patterns, traps and habits that save marks

Frequently asked question patterns

- Odd days in years and centuries.
- Leap-year checks, especially century years.
- Weekday of a given date, including famous dates.
- The same date in another year, or the day after n days.
- Years with the same calendar.
- Number of Sundays / Mondays in a year.
- Last day of a century; big-power day questions.

Common mistakes to avoid

- Treating every year divisible by 4 as leap (1900 and 2100 are not).
- Adding 2 odd days for a leap year when 29 February is not crossed.
- Including the starting day when counting “after n days”.
- Matching only the 1 January weekday and forgetting the leap status for same-calendar years.
- Using 30 days for every month.
- Forgetting that a century of 100 years has 5 odd days, not 1.

Points to remember

- Ordinary year 1 odd day, leap year 2.
- 100, 200, 300, 400 years → 5, 3, 1, 0 odd days.
- Century year is leap only if divisible by 400.
- Leap year’s calendar repeats after 28 years.
- Last day of a century: Mon, Wed, Fri or Sun only.

Speed and accuracy

- Reduce by 7 at every step.
- Use an anchor date you already know.
- Learn the month odd-days table.
- Use doomsday dates (4/4, 6/6, 8/8 …) for quick checks.

Preparation strategy

- Master odd days and the leap-year rule before the weekday method.
- Practise on LearnFrenzy in order: Easy → Medium → Hard → Exam Pattern Mix → Data Sufficiency.
- Aim for 40–60 seconds per calendar question.
- Keep an error log of leap-year and counting slips.
- Read the Quick Revision Sheet (next page) the night before the exam.

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6 Quick revision sheet

Everything on one page for the night before the exam

Formulas

Odd days	**days mod 7**	Ordinary / leap year	**1 / 2 odd days**
Leap rule	**÷ 4; centuries ÷ 400**	100 years	**5 odd days**
200 years	**3 odd days**	300 years	**1 odd day**
400 years	**0 odd days**	31-day month	**3 odd days**
30-day month	**2 odd days**	Same date next year	**+1 (or +2 across 29 Feb)**
After n days	**+ (n mod 7)**	Leap calendar repeats	**+28 years**
53 weekdays	**1 Jan (and 2 Jan if leap)**	Century ends on	**Mon, Wed, Fri, Sun**

Shortcut tricks

- Reduce by 7 every step.
- Anchor on a known date.
- Doomsday: 4/4, 6/6, 8/8 …
- Same calendar: day + leap match.
- Big powers: $2^3 \equiv 1$, $3^6 \equiv 1 \pmod 7$.
- Ordinary year: 31 Dec = 1 Jan.

Must-know numbers

Weekday codes	Sun 0 · Mon 1 · Tue 2 · Wed 3 · Thu 4 · Fri 5 · Sat 6
Month odd days	Jan 3 · Feb 0/1 · Mar 3 · Apr 2 · May 3 · Jun 2 · Jul 3 · Aug 3 · Sep 2 · Oct 3 · Nov 2 · Dec 3

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7 A message from LearnFrenzy

For everyone preparing for placements, competitive and government exams

Keep going – you are closer than you think

Success in examinations is not just about how many hours you study. It is about how effectively you understand concepts, practise questions, and improve yourself every day.

Every formula you learn, every problem you solve, and every mistake you correct brings you one step closer to your goal.

Whether you are preparing for campus placements, competitive examinations, or government jobs, remember that consistency, confidence, and smart preparation make a real difference.

Don’t just memorize formulas. Understand the concepts, practise smart techniques, and develop the confidence to solve problems independently.

Your hard work today can create the opportunities you dream of tomorrow.

— Team LearnFrenzy

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