# IFAS CSIR NET

## CALENDER

Q.1

Pipe A → 5 hrs (+)

Pipe B → 6 hrs (+)

Pipe C → 12 (hrs) (−)

3 | 5, 6, 12

2 | 5, 2, 4

5, 1, 2

L.C.M = 60

Total = 60 unit

Pipe A → 12 unit/hr (+) Pipe B → 10 units/hr (+)

Pipe C → 5 units/hr (−)

A + B + C → 17 units/hr Time = $\frac{60}{17}$ unit

Ans $3\frac{9}{17}$

Q5 A → 20 days, B → 30 days, C → 60 days

In how many days A do the work if he is assisted by B and C on every third day?

(1) 12 days (2) 15 days (3) 16 days (4) 18 days

Soln A → 3 units/day

B → 2 units/day

C → 1 unit/day

5 × 3 = 15 days

$\frac{60}{12} = 5$

Total = 60 units

| 1st | 2nd | 3rd |
|---|---|---|
| 3 | 3 | 3+2+1 = 6 |

3 + 3 + 6 = 12 units

3 — 12 units

→ 1 — $\frac{12}{3}$ units = 4 units

60 units

$\frac{60}{4} = 15$

# Calender

Day Week Month Year

31/30/28/29 52 12 366 / 365

366 → Leap year

Actual: 365 days 6 hrs

6 × 4 = 24 hrs

$$7 \overline{)365} \quad 52 \quad 35 \quad 15 \quad 14 \quad 1$$

$$7 \overline{)366} \quad 52 \quad 35 \quad 16 \quad 14 \quad 2$$

## "Odd days"

Normal year (365 days) → Odd day 1

$$7 \overline{)365}\ (52,\ 35,\ 15,\ 14,\ 1)$$

1 → remainder

$$7 \overline{)366}\ (52,\ 35,\ 16,\ 14,\ 2)$$

2 → extra days

Leap years → 2 odd days

# Which year is a leap year?

- A year which is divided by 4:

  Ex. • Is 2016 a leap year?

  Ans: Yes

  • Is 1952 a leap year?

  Ans: Yes

• Is 100 a leap year? Ans. NO.

100, 200, 300, ---, 400, --, 1600, 1700, ---

Any multiple of 100 will be a Leap year if it is divisible by 400

Yes 400, 800, 1200, 1600, 2000, 2400, ---

Leap years.

How many odd days are there in 100 years?

100

25 leap years

100 is not a leap year!

75 normal years?

??

$$4 \overline{)100} \quad 25 \quad 100 \quad 0$$

4, 92, 96, 100

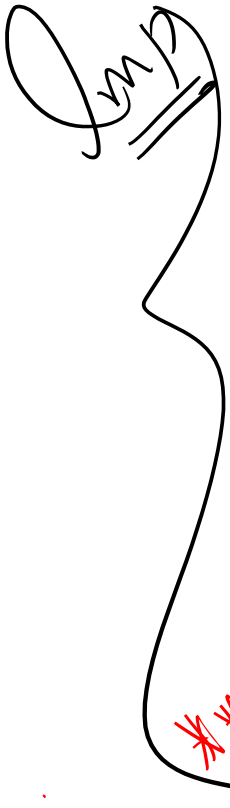
4 × 25

$$7 \overline{)124} \quad 17 \quad 7 \quad 54 \quad 49 \quad 5$$

24 leap years + 76 normal years

Odd days → (24×2) + (76×1) = 48 + 76 = 124 → reduced by 7 → 5

Odd days



100 years ⟶ 5 odd days

200 years ⟶ 10 odd days
reduced by 7 → 3 odd days

$$7 \overline{)10} \quad 1, \quad 10 - 7 = 3$$

300 years ⟶ 15 odd days
reduced by 7 → 1 odd day

400 years ⟶ (4 × 5) = 20 + 1 = 21
reduced by 7 → 0 odd days

*** 400, 800, 1200, 1600, 2000 ⟶ 0 odd days

Q. Today is Wednesday, what will be the day of the week after 71 days from today?

(A) Sunday (B) Tuesday

(C) Thursday (D) Friday

Soln:

$$7 \overline{)71} \quad 10 \quad 70 \quad 1$$

1 odd day

10 days

$$7 \overline{)10} \quad 1 \quad 7 \quad 3$$

3 odd day

Ans. Saturday

Gregorian Calendar

Q.1 Galileo Galilei

15th Feb, 1564, Pisa, Italy

Which day it was?

Saturday

1564

1563

1200 + 300 + 63

15 leap years

+48 normal years

$4 \overline{)63}$ → 15, 4, 23, 20, 3

Odd days: $0 + 1 + (15 \times 2) + (48 \times 1) = 79$ days

days | Odd days

Jan → 31 days | 3

Feb → 15 days | 1

$7\overline{)31}\ 4,\ 28,\ 3$

$7\overline{)15}\ 2,\ 14,\ 1$

Total Odd days → $7y + 3 + 1$

$= 83$

$7\overline{)83}\ 11,\ 7,\ 13,\ 6$

reduced by 7 Odd days → 6

Ans. Saturday

| Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|---|---|---|---|---|---|---|
| Odd day 1 | 2 | 3 | 4 | 5 | 6 | 7/0 odd day |

Jo hannes Kepler →

27th Dec, 1571, Germany

Which day it was?

Monday

Sun

17 leap years + 53 normal years

70 − 17 = 53

17 ÷ 4 → 70, 4, 30, 28

1570 = 1200 + 300 + 70

Odd days: 0 + 1 + (17×2) + (53×1) = 88


Odd days

| | | |
|---|---|---|
| 31 days | Jan | 3 |
| 28/29 days | Feb | 0/1 ↳ Leap year |
| 31 days | March | 3 |
| | April | 2 |
| | May | 3 |
| | June | 2 |

Odd days

| | |
|---|---|
| July | 3 |
| Aug | 3 |
| Sept | 2 |
| Oct | 3 |
| Nov | 2 |
| Dec | 3 |

July/Aug
31 days

Total days
= 88+53
= 141 days
⟶ 1 Odd day

3 + 0 + 3 + 2 + 3 + 2 + 3 + 3 + 2 + 3 + 2 + 27 (Dec)

⟶ 53 days

27th Dec, 1571

Ans Monday

31st Dec 1571

1200 + 300 + 71

17 leap years

+ 54 normal years

$$\begin{array}{r} 71 \\ -17 \\ \hline 54 \end{array}$$

$$4 \overline{)\,17\,1} \quad 4$$

$$\begin{array}{r} 31 \\ 28 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 31 \\ -27 \\ \hline 4 \end{array}$$

$$7 \overline{)\,85\,(12} \quad 7,\ 15,\ 14,\ 1$$

Odd days $0 + 1 + 34 + 54 \rightarrow 89$ days

Actual odd days upto 27th Dec, 1571

89 − 4 = 85 days → reduced by 7 → 1 odd day

Isaac Newton → 4th January 1643, UK

Which day it was?

(a) Monday (b) Saturday

(3) Thursday (4) Sunday

$$7 \overline{)56} \quad 8 \quad 56 \quad 0$$

$$4 \overline{)42} \quad 10 \quad 40$$

1642

1600 + 42

10 leap years + 32 N.Y

Odd days: 0 + 20 + 32 → 52 + 4

→ 56

Albert Einstein, 14th March, 1879, Germany

Which day it was?

(A) Friday (B) Monday

(B) Thursday (D) Sunday

Jan — 3

Feb — 0

March — 0

multiple of 400

1878

1600 + 200 + 78

19 × 2 = 38

Odd days → 0 + 3 + 38 + 54 = 100 + 3 = 103

14
7 | 103
7
33
28
5

19
4 | 78
4
38
36
2

Srinivasa Ramanujam,

22nd Dec, 1887

Which day it was?

(1) Tuesday

(2) Thursday

(3) Friday

(4) Saturday.

31
−22
9

1887

1600 + 200 + 87

Odd days: 0 + 3 + 42 + 66

= 111 − 9 = 102

21
4 | 87
8
7
4
3

14
7 | 102
7
32
28
4

4 odd day

Q.1 If March 18th, 1994 falls on Friday then 25th, 1995 falls on which day?

(1) Wednesday
(2) Monday
(3) Saturday
(4) Sunday

March 18th 1994 → Friday

March 18th 1995 → Saturday

Feb 3 + March 18 + 21 days

21 days = 0 odd days

7 | 21 | 3 | 0

Q. It was Sunday on Jan 1, 2006, what was the day of the week on Jan 1, 2010? (CSIR)

(1) Monday (1) Friday

(3) Sunday (4) Tuesday

Jan 1, 2006 → Sun

Jan 1, 2007 → Mon

Jan 1, 2008 → Tuesday

Jan 1, 2009 → Thursday } +2

Jan 1, 2010 → Friday

# CALENDER

HAPPY LEARNING

# THANKS