CHAPTER – 6
CALENDARS

Suppose you are asked to find the day of the week on 30th June, 1974, it would be a tough job to find it if you do not know the method. The method of finding the day of the week lies in the number of "odd days".

Note: Every 7th day will be the same day count wise, i.e. if today is Monday, then the 7th day counting from Tuesday onwards will once again be Monday. Odd day is the days remaining after completion of an exact number of weeks. Odd day is the reminder obtained on dividing the total number of days with seven.

Example*:* 52 days ÷ 7 = 3 odd days.

Leap and Non-leap Year:

A Non- leap year has 365 days whereas a leap year has one extra day because of 29 days in the month of February. Every year which is divisible by 4 is called a leap year. Leap year consists of 366 days, (52 complete weeks + 2 days), the extra two days are the odd days. So, a leap year has two odd days.

An non-leap year consists of 365 days (52 complete weeks + 1 day). The extra one day is the odd day.

Note: Every century, year which is a multiple of 400, is a leap year. A century year which is not divisible by 400 is a non-leap year.

Example: 400, 800, 1200, 1600 …. are leap years. 500, 700, 900, 1900 … are non-leap years.

Counting the number of Odd Days:

100 years consist of 24 leap years + 76 ordinary years. (100 years when divided by 4, we get 25. But at the 100th year is not a leap year, hence only 24 leap years).
= 2 x 24 odd days + 1 x 76 odd days
= 124 days
= 17 weeks + 5 days
The extra 5 days are the odd days.
So, 100 years contain 5 odd days.
Similarly, for 200 years we have 10 extra days (1 week + 3 days).
∴ 200 years contains 3 odd days.
Similarly, 300 years contain 1 odd day and 400 years contain 0 odd days.

Counting of number of odd days, when only one date is given:

Here we take January 1st 1 AD as the earlier date and we assume that this day is a Monday. We take its previous day, i.e. Sunday as the reference day. After this the above mentioned method is applied to count the number of odd days and find the day of the week for the given date.

Counting number of odd days, when two dates are given:

Any month which has 31 days has 3 odd days.
(∵ 31 ÷ 7 leaves 3 as remainder) and any month which has 30 days has 2 odd days (30 ÷ 7 leaves 2 as remainder).

Then, the total number of odd days are calculated by adding the odd days for each month. The value so obtained is again divided by 7 to get the final number of odd days. The day of the week of the second date is obtained by adding the odd days to the day of the week of the earlier date.

Examples:

1. If you were born on 14th April, 1992, which was a Sunday, then on which day of the week does your birthday fall in 1993?
(A) Monday (B) Tuesday
(C) Wednesday (D) Friday
(E) Thursday

Sol: 14th April 1992 to 14th April 1993 is a complete year, which has 365 days. Hence, the number of odd days from 14th April 1992 to 14th April 1993 is 1. Hence, 14th April 1993 is one day after Sunday i.e., Monday. Choice (A)

2. If 1st Jan, 1992 is a Tuesday then on which day of the week will 1st Jan, 1993 fall?
(A) Wednesday (B) Thursday
(C) Friday (D) Saturday
(E) Tuesday

Sol: Since 1992 is a leap year there are 2 odd days. Hence, 1st January 1992 is two days after Tuesday i.e., Thursday. Choice (B)

3. If 1st April, 2003 was Monday, then which day of the week will 25th December of the same year be?
(A) Tuesday (B) Wednesday
(C) Thursday (D) Friday
(E) Monday

Sol: The number of days from 1st April to 25th December
(29 + 31 + 30 + 31 + 31 + 30 + 31 + 30 + 25) days
= 268 days
$= \frac{268}{7} = 38 + 2\,\text{odd days}$.
Hence, 25th December is two days after Monday, i.e., Wednesday. Choice (B)

4. On which day of the week does 4th June, 2001 fall?
(A) Monday (B) Tuesday
(C) Wednesday (D) Thursday
(E) Friday

Sol: 4^{th} June 2001 $\Rightarrow$ (2000) years + 1^{st} January to 4^{th} June 2001.
We know that 2000 years have zero odd days. The number of odd days from 1^{st} January to 4^{th} June 2001.
Month : Jan + Feb + Mar + Apr + May + June
Odd day: 3 + 0 + 3 + 2 + 3 + 4
$\frac{15}{7}$ = 1 odd day.
Hence, 4^{th} June 2001 was a Monday.
Choice (A)

5. Which year will have the same calendar as that of 2005?
(A) 2006 (B) 2007
(C) 2008 (D) 2011
(E) 2012

Sol: Year: 2005+2006+2007+2008+2009+2010
Odd days : 1+ 1+ 1+ 2+ 1 + 1
Total number of odd days from 2005 to 2010 are 7 ≅ 0 odd days.
Hence, 2011 will have the same calendar as that of 2005. Choice (D)

6. What day of the week was 18^{th} April 1901?
(A) Monday (B) Tuesday
(C) Wednesday (D) Friday
(E) Thursday

Sol: 18^{th} April 1901 $\Rightarrow$ (1600 + 300) years + 1^{st} January to 18^{th} April 1901.
1600 years have – 0 odd days
300 years have – 1 odd day
The number of days from 1^{st} January, 1901 to 18^{th} April 1901 is (31 + 28 + 31 + 18) days
108 days ≅ 3 odd days
$\therefore$ Total number of odd days = 3 + 1 = 4
Hence, 18^{th} April 1901 is Thursday.
Choice (E)

Exercise – 6

Directions for questions 1 to 25: Select the correct alternative from the given choices.

1. If 8th February 1995 was a Wednesday, then 8th February 1994 was on which day?
(A) Wednesday (B) Thursday
(C) Friday (D) Monday
(E) Tuesday

2. If 17th September 1993 was a Friday, then which day of the week was 30th June 1989?
(A) Wednesday (B) Thursday
(C) Friday (D) Saturday
(E) Tuesday

3. If 11th August 1985 was a Sunday, that which day of the week was 13th August 1986?
(A) Tuesday (B) Monday
(C) Thursday (D) Friday
(E) Wednesday

4. How many odd days are there in 352 days?
(A) 1 (B) 2 (C) 3
(D) zero (E) 4

5. Which among the following years is a leap year?
(A) 3000 (B) 3100 (C) 3200
(D) 3300 (E) 3500

6. If 1st January 2012 is a Sunday, then which day of the week will the new year be celebrated in 2016?
(A) Friday (B) Sunday
(C) Wednesday (D) Saturday
(E) Thursday

7. If 1st April 1963 was a Monday, then which day of the week will 1st August 1959 be?
(A) Wednesday
(B) Monday
(C) Tuesday
(D) Thursday
(E) Saturday

8. On which dates of October, 1994 did Monday fall?
(A) 4, 11, 18, 25 (B) 2, 9, 16, 23
(C) 1, 8, 15, 22 (D) 3, 10, 17, 24, 31
(E) 5,12,19,26

9. Which year will have same calendar as 2002?
(A) 2008 (B) 2011 (C) 2009
(D) 2013 (E) 2015

10. Which year will have same calendar as 1984?
(A) 2020 (B) 2008 (C) 2012
(D) 2004 (E) 2006

11. What will be next leap year after 2096?
(A) 2100 (B) 2101 (C) 2104
(D) 2108 (E) 2106

12. If in a calendar year, there are 541 days and 10 days a week, then how many odd days will be there in that year?
(A) 1 (B) 2 (C) 3
(D) 4 (D) Zero

13. The last day of a century cannot be
(A) Friday (B) Wednesday
(C) Monday (D) Tuesday
(E) Sunday

14. Which day of the week was 25th December, 1995?
(A) Sunday (B) Monday
(C) Tuesday (D) Wednesday
(E) None of these

15. Which day of the week was 23rd July 1776?
(A) Sunday (B) Wednesday
(C) Thursday (D) Tuesday
(E) Monday

16. If holidays are declared only on Sundays and in a particular year 12th March is a Sunday, is 23rd September in that year a holiday?
(A) Yes
(B) No
(C) Yes, if it is a leap year.
(D) No, if it is a leap year.
(E) Cannot be determined

17. Which day of the week was 1601, Jan 15?
(A) Monday (B) Tuesday
(C) Wednesday (D) Thursday
(E) Friday

18. The first Republic day was celebrated on 26th Jan 1950. It was a
(A) Thursday (B) Friday
(C) Monday (D) Tuesday
(E) Wednesday

19. If 23rd April 2006 is a Sunday, then 23rd April 2106 will be a
(A) Wednesday (B) Thursday
(C) Friday (D) Saturday
(E) Sunday

20. If the first day of the years 2012 and 2023 are Mondays, which day of the week will the last days of years be respectively?
(A) Tuesday, Tuesday
(B) Tuesday, Monday
(C) Monday, Tuesday
(D) Sunday, Monday
(E) Tuesday, Wednesday

21. If 14th November 2006 is a Sunday, then 14th November 2706 is a
(A) Sunday (B) Friday
(C) Tuesday (D) Monday
(E) Wednesday

22. In a year, if 23rd November is a Friday then 14th March in that year is on which day of the week?
(A) Monday (B) Wednesday
(C) Sunday (D) Tuesday
(E) Saturday

23. In a leap year, which month will have the same calendar as that of January in that year?
(A) April (B) July
(C) October (D) March
(E) June

24. What is the next leap year after 2396?
(A) 2398 (B) 2408 (C) 2404
(D) 2400 (E) 2412

25. Which day of the week is 21st April 2006?
(A) Tuesday (B) Wednesday
(C) Thursday (D) Monday
(E) Friday

Key

1. E	6. A	11. C	16. B	21. D
2. C	7. E	12. A	17. A	22. B
3. E	8. D	13. D	18. A	23. B
4. B	9. D	14. B	19. C	24. D
5. C	10. C	15. D	20. B	25. E