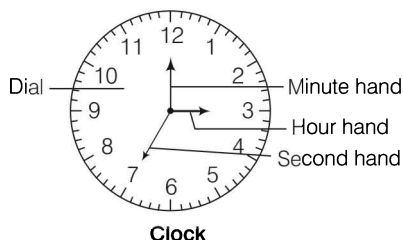# 11

Clock and Calendar

Clock

A clock is a circular/square shaped instrument used to view/measure time in hours, minutes and seconds.

There are mainly four important parts of a clock—dial, hour hand, minute hand and second hand.

Clock

60 seconds = 1 minute

60 min = 1 hour

30 min = Half of an hour

15 min = Quarter of an hour

Important Points

- Both hands of a clock occurs at right angle twice in one hour, 22 times in 12 h and 44 times in 24 h.
- Both hands of a clock occurs in a straight line or are opposite once in one hour, 11 times in 12 h and 22 times in 24 h.
- The hands of a clock coincide once in an hour, 11 times in 12h and 22 times in 24h.

Example 1 The priest told the devotes, ''The bell rings at regular intervals of 45 min. The last bell was rung 5 min ago. The next bell is due to be rung at 7 : 45 am''. At what time did the priest give the information to the devotes?

(a) 6 : 55 am   (b) 7 : 00 am

(c) 7 : 05 am   (d) 7 : 40 am

Sol. *(c)* Time of ringing of last bell

$$= (7 : 45 - 0 : 45) = 7 : 00 \text{ am}.$$

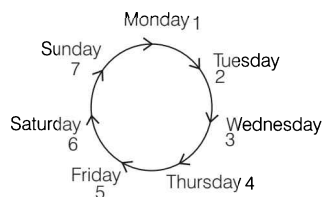But it happened 5 min before the priest gave the information to the devotees.

∴ Time of giving information

$$= 7 : 00 + 0 :05 = 7 : 05 \text{ am}$$

Calendar

The record of all the days of the year is given in the calendar. It shows the months, weeks and days in the year.

Days

There are seven days in a week. A week starts with Monday and ends at Sunday. The same cycle goes on and on.

Months of the Year

We know that, there are 12 months in a year.

January, March, May, July, August, October and December have 31 days each. April, June, September and November have 30 days each, February has 28 days in an ordinary year and 29 days in a leap year.

Century

A period of 100 years is called a century. Thus, each one of the years 1100, 1800, 2000, 2100 is a century.

Ordinary Year

An ordinary year is a year which has 365 days (52 weeks +1 day). Such years are not divisible by 4. e.g. 2001, 2002, 2003, 2005, etc.

Ordinary years in the form of century are not exactly divisible by 400.

e.g. 100, 200, 500, etc.

In any two consecutive ordinary years, date of the next year will be one day ahead of the same date of previous year. e.g. If 2nd March, 2010 is Tuesday, then 2nd March, 2011 will be Wednesday.

Leap Year

A leap year is a year which has 366 days (52 weeks +2 days). Such years are exactly divisible by 4. e.g. 2004, 2008, 2012, etc.

Leap year in the form of a century are exactly divisible by 400. e.g. 400, 1200, etc.

If a leap year comes immediately after ordinary year, date of the next year will be two days ahead of the same date of previous year (from March to December) and one day ahead of the same date of previous year (in January and February) e.g. If 24th February 2015 is Monday, then 24th February, 2016 is Tuesday and if 16th March, 2015 is Wednesday, then 16th March, 2016 is Friday.

Important Points

- The first day of century cannot be Wednesday, Friday or Sunday.
- The last day of century cannot be Tuesday, Thursday or Saturday.

Example 2 Which of the following is not a leap year?
(a) 2000   (b) 2600   (c) 1600   (d) 1996

Sol. *(b)* The century year divisible by 400 is a leap year. So, 2000 and 1600 are leap years. Also, 1996 is a leap year. Only 2600 is not a leap year.

Example 3 Sameer remembers that his brother's birthday is after 15th but before 18th of February whereas his sister Kanika remembers that her brother's birthday is after 16th but before 19th of February. On which day in February is Sameer's brother's birthday?
(a) 15th February
(b) 18th February
(c) 17th February
(d) None of the above

Sol. *(c)* As per Sameer, birthday is on 16th or 17th February.

As per Kanika, birthday is on 17th or 18th February.

17th February is common in both the groups.

Clearly, the correct date is 17th February.

Example 4 If the day after tomorrow is a Sunday, what was it day before yesterday?
(a) Wednesday
(b) Thursday
(c) Friday
(d) Saturday

Sol. *(a)* The day after tomorrow = Sunday.

∴   Tomorrow = Saturday

∴   Today = Friday

∴   Yesterday = Thursday

So, the day before yesterday = Wednesday.

Example 5 If 1st January, 2001 was Monday, then what day of the week was it on 31st December, 2001?
(a) Wednesday
(b) Friday
(c) Monday
(d) Saturday

Sol. *(c)* Year 2001 was an ordinary year and in an ordinary year 1st day is same as last day (remember)

i.e. Day on 1st January is same as day on 31st December.

As, given that, 1st January = Monday

Hence, 31st December = Monday

⏰ Practice Exercise

1. Manoj left home for the bus stop 15 min earlier than the usual time. It takes 10 min to reach the stop. He reached the stop at 8:40 am What time does he usually leave home for the bus stop?
   (a) 8 : 30 am   (b) 8 : 55 am
   (c) 8 : 45 am   (d) Data inadequate

2. Aseem leaves his house at 20 min to 7 in the morning, reaching Kaushal's house in 25 min, they finish their breakfast in another 15 min and leave for their office which takes another 35 min. At what time do they leave Kaushal's house to reach their office?
   (a) 7 : 55 am   (b) 8 : 15 am
   (c) 7 : 45 am   (d) 7 : 20 am

3. Pratap correctly remembers that his mother's birthday is before 23rd April but after 19th April, whereas his sister correctly remembers that their mother's birthday is not on or after 22nd April. On which day in April is definitely their mother's birthday?
   (a) 20th
   (b) 21st
   (c) 20th or 21st
   (d) Cannot be determined

4. Rajat correctly remembers that his mother's birthday is not after 18th of June. His sister correctly remembers that their mother's birthday is before 20th June but after 17th June.On which day in April was definitely their mother's birthday?
   (a) 17th   (b) 19th
   (c) 18th   (d) 17th or 18th

5. Meena correctly remembers that her father's birthday is after 18th May but before 22nd May. Her brother correctly remembers that their father's birthday is before 24th May but after 20th May. On which date in May was definitely their father's birthday?
   (a) 20th   (b) 19th
   (c) 18th   (d) None of these

6. Today is Monday. After 61 days, it will be
   (a) Wednesday   (b) Saturday
   (c) Tuesday   (d) Thursday

7. If today is Thursday, then what will be the day on 363rd day?
   (a) Sunday   (b) Saturday
   (c) Thursday   (d) None of these

8. Satish reads a book on Sunday. Sudha reads that book one day prior to Anil but 4 days after Satish. On which day did Anil read the book?
   (a) Friday   (b) Thursday
   (c) Tuesday   (d) Saturday

9. 2 days before yesterday was Friday, then what day of the week will be day after tomorrow?
   (a) Monday   (b) Sunday
   (c) Saturday   (d) Wednesday

10. If a day before yesterday was Thursday, then when will Sunday fall?
    (a) Today
    (b) 2nd day after today
    (c) Tomorrow
    (d) A day after tomorrow

11. If day after tomorrow is Tuesday, then what day of the week will it be on 2 days after the day after tomorrow?
    (a) Monday   (b) Wednesday
    (c) Saturday   (d) Thursday

12. If Tuesday falls 3 days after today, then what day of the week was it on 4 days before yesterday?
    (a) Monday   (b) Tuesday
    (c) Wednesday   (d) Sunday

13. In a month of 31 days, third Thursday falls on 16th. What will be the last day of the month?
    (a) 5th Friday   (b) 4th Saturday
    (c) 5th Wednesday   (d) 5th Thursday

14. If 18th February, 1997 falls on Tuesday, then what will be the day on 18th February, 1999?
    (a) Monday   (b) Tuesday
    (c) Thursday   (d) Friday

15. If January 1 is a Friday, then what is the first day of the month of March in a leap year?
    (a) Tuesday   (b) Wednesday
    (c) Thursday   (d) Friday

Answers

1	(c)	2	(d)	3	(c)	4	(c)	5	(d)	6	(b)	7	(d)	8	(a)	9	(d)	10	(c)
11	(d)	12	(a)	13	(a)	14	(c)	15	(a)										

Hints & Solutions

1. Manoj reached the bus stop at 8:40 am. He left his home at 8:40 −10 min = 8:30 am. He left 15 min earlier than usual, so his actual time of leaving home is 8:30 am +15 min = 8:45 am

2. Aseem leaves his house at 20 min to 7, i.e. at 6 : 40 am.
He reaches Kaushal's house at
$$= 6 : 40 + 0 : 25 = 7 : 05 \text{ am}$$
They finish their break fast at
$$= 7 : 05 + 0 : 15 = 7 : 20 \text{ am}$$
Then, both leave for office at 7:20 am.

3.

According to	Birthday
Pratap	20th, 21st, 22nd
His sister	Befor 22nd

So, their Mother's birthday is either on 20th or 21st April.

4.

According to	Birthday
Rajat	on or Before 18th
His sister	18th, 19th

Clearly, June 18 is the required day.

5.

According to	Birthday
Meena	19th, 20th, 21st
Her brother	21st, 22nd, 23rd

Clearly, 21st May is common in both the groups and hence it is the required day.

6. Each day of the week is repeated after 7 days. So, after 63 days, it will be Monday. Therefore, after 61 days, it will be Saturday.

7. Each day is repeated after 7 days. So, after 364 days, it will be thursday. Hence, after 363 days, it will be wednesday.

8. Sudha read the book 4 days after Sunday. It means Sudha read the book on Thursday. Hence, Anil will read the book on Friday.

9. 2 days before yesterday = Friday
∴ Yesterday = Friday + 2 = Sunday
∴ Today = Sunday + 1 = Monday
∴ Day after tomorrow
= Monday + 2 = Wednesday

10. A day before yesterday = Thursday
Yesterday = Thursday + 1 = Friday
Today = Friday + 1 = Saturday
∴ Sunday = Saturday + 1 = Tomorrow

11. A day after tomorrow = Tuesday
∴ Two days after the day after tomorrow
= Tuesday + 2 = Thursday

12. Three days after today = Tuesday
Today = Tuesday − 3 = Saturday
Yesterday = Saturday − 1 = Friday
∴ 4 days before yesterday = Friday − 4 = Monday

13. Friday will fall on 3,10, 17, 24, 31
So, it will be 5th Friday on 31st.

14. 18th February, 1997 is Tuesday. So, 18th February, 1998 will be Wednesday.
Hence, 18th February, 1999 will be Thursday.

15. Total number of days in a leap year from January 1 to March 1 = 30 + 29 + 1 = 60 days
Each day of the week is repeated after 7 days. So, it will be Friday after 56 days. Hence, after 60 days, it will be Tuesday.

➡ Try Yourself

1) How many times in a day, do the hands of a clock coincide with each other?
   (a) 12
   (b) 24
   (c) 22
   (d) 44

2) How many times in a day are the hands of a clock pointing opposite to each other?
   (a) 20
   (b) 4
   (c) 24
   (d) 22

3) Which of the following is a leap year?
   (a) 2800
   (b) 1800
   (c) 2600
   (d) All of these

4) The last day of a century cannot be either
   I. Tuesday   II. Thursday
   III. Saturday   IV. Sunday
   (a) I and II
   (b) I and IV
   (c) I, II and III
   (d) I,III and IV

5) Mohan correctly remembers that his father's birthday is before 20th January but after 16th January whereas his sister correctly remembers that their father's birthday is after 18th January but before 23rd January. On which date in January is definitely their father's birthday?
   (a) 18th
   (b) 19th
   (c) 20th
   (d) Data inadequate

6) Nitin correctly remembers that Nidhi's birthday is before Friday but after Tuesday. Deepak correctly remembers that Nidhi's birthday is after Wednesday but before Saturday. On which of the following days does Nidhi's birthday definitely fall?
   (a) Monday
   (b) Tuesday
   (c) Wednesday
   (d) Thursday

7) Today is Thursday. The day after 59 days will be
   (a) Sunday
   (b) Monday
   (c) Tuesday
   (d) Wednesday

8) Today is Wednesday, what will be the day after 84 days?
   (a) Monday
   (b) Tuesday
   (c) Wednesday
   (d) Sunday

9) If day before yesterday was Thursday, then when will be the Monday?
   (a) Day after tomorrow
   (b) Today
   (c) Tomorrow
   (d) Two days after days

10. If it is Saturday on 1st, January 2000, then 1st, January 2001 would have been
    (a) Monday
    (b) Tuesday
    (c) Friday
    (d) Saturday

Answers

1	(c)	2	(d)	3	(a)	4	(c)	5	(b)
6	(d)	7	(a)	8	(c)	9	(a)	10	(a)