CLOCKS & CALENDARS

CALENDAR : The time in which the earth travels around the sun is a solar year and is equal to **365 days 5 hrs. 48 minutes and 47 1/2 seconds** .Year is **365.2422 days** approximately. The common year consists of 365 days. The difference between a **common year and a solar year** is therefore **0.2422** of a day and we consider it by adding a whole day to every fourth year. Consequently in every 4th year there are **366 days**. **The years which have the extra day are called leap years.** The day is inserted at the end of February, The difference between 4 common years and 4 solar years is 0.969 of a day.

If therefore, we add a whole day to every 4th year, we add too much by 0.0312 of a day. To take account of this, we omit the extra day three times every 400 years,

The thing is to ensure that each season may fall at the same time of the year in all years. In course of time, without these corrections, we should have winter in July and summer in January also .

We are supposed to find the day of the week on a given date.

1. **Odd Days :** The number of days more than the complete weeks are called odd days.
2. **Leap Year :**
   (a) Every year divisible by 4 is a leap year, if it is not a century
   (b) Every 4^{th} century is a leap year.
   (c) A leap year has 366 days
3. **Ordinary Year :** The year which is not a leap year is called Ordinary Year. It has 365 days.
4. 1 ordinary year = 365 days = (52 weeks + 1 day)
5. 1 leap year = 366 days = (52 weeks + 2 days)
6. 100 years = 76 ordinary years + 24 leap years
   $= (76\times1+24\times2)$ odd days = 124 odd days
   = (17 weeks + 5 days)
   = 5 odd days
   200 yrs = 3 odd days , 300 yrs = 1 odd day , 400 years = 0 odd days
   Similarly 800 yrs , 1200 yrs , 1600 yrs , 2000 yrs have 0 odd days.
7. Days of the week related to odd days :

No. of odd days	0	1	2	3	4	5	6
Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

8. Last day of a century cannot be either Tuesday. Thursday or Saturday.
9. The first day of a century must either be Monday. Tuesday, Thursday or Saturday.

CLOCKS :

1. **Face of clock / Dial of watch :** It is a circle . Circumference divided into 60 equal parts (called as minute spaces).
2. Smaller hand = Short hand = Hour Hand
   Larger hand = Long hand = Minute hand
3. 1 minute is equivalent to (360/60=)6^{0}
4. 1 hour is equivalent to (360/12=)30^{0}
5. In 60 minutes, the minute hand gains 55 minutes on the hour hand. Hence x minute space to be gained by minute hand over hour hand can be calculated as x.(60/55) or x.(12/11)
6. In every hour both the hands coincide once
7. when both the hands are at right angles, they are 15 minutes apart
8. When both the hands are in straight line, they are coincident or opposite to each other (30 min apart)
9. For hour hand to complete 360^{o}, it takes 12 hours
10. For minute hand to complete 360^{o}, it takes 60 minutes
11. Too fast : When ahead of actual time
12. Too slow : When behind the actual time
13. The hands of the clock are perpendicular to each other for 22 times in 12 hours and for 44 times in a day.
14. The hands of the clock are opposite to each other 11 times in 12 hours and 22 times in a day.

15. The hands of the clock coincides with each other for 11 times in 12 hours and 22 times per day

16. The hands of the clock are 44 times in a straight line per day.

17. A **Reflex Angle** is more than 180° but less than 360°