Clocks Concepts

1. **Minute Spaces**

The face or dial of clock is a circle whose circumference is divided into 60 equal parts, named minute spaces.

2. **Hour hand and minute hand**

A clock has two hands. The smaller hand is called the hour hand or short hand and the larger one is called minute hand or long hand.

3. In 60 minutes, minute hand gains 55 minute spaces over the hour hand.

(In 60 minutes, hour hand will move 5 minute spaces while the minute hand will move 60 minute spaces. In effect the space gain of minute hand with respect to hour hand will be 60 - 5 = 55 minutes.)

4. **The hands of a clock coincide(overlap or straight line but in <u>same</u> direction) 22 times in a day. (eg 12 noon)**

5. The hands of a clock are in the same straight line when they are coincident or opposite to each other.

6. When the two hands of a clock are at right angles, they are 15 minute spaces apart.

7. When the hands of a clock are in opposite directions, they are 30 minute spaces apart.

8. Angle traced by hour hand in 12 hrs = 360°

9. Angle traced by minute hand in 60 min. = 360°.

10. If a watch or a clock indicates 9.15, when the correct time is 9, it is said to be 15 minutes too fast.

11. If a watch or a clock indicates 8.45, when the correct time is 9, it is said to be 15 minutes too slow.

12. **The hands of a clock will be in straight line but <u>opposite</u> in direction, 22 times in a day.**

13. The hands of a clock coincide(overlap or straight line but in <u>same</u> direction) 22 times in a day.

14. The hands of a clock are straight (both coincide and opposite) 44 times in a day.

15. The h**ands of a clock are at right angles 44 times in a day.**

16 The two hands of a clock will be together between H and (H+1) o' clock at

(60H/11) minutes past H o' clock.

17 The two hands of a clock will be in the same straight line but not together between H and (H+1) o' clock at

(5H-30) 12 / 11   minutes past H   when H>6

(5H+30) 12 / 11 minutes past H when H <6

18 The two hands of the clock will be at right angles between H and (H+1) o' clock at

(5H±15)12/11 **minutes past H 'o clock**

The reflex angle between the hands of a clock at 10.25 is: 197.5

A clock is started at noon. By 10 minutes past 5, the hour hand has turned through: 155

The angle between the minute hand and the hour hand of a clock when the time is 4.20, is: 10 Ans

At what angle the hands of a clock are inclined at 15 minutes past 5?
67.5

At 3:40, the hour hand and the minute hand of a clock form an angle of:

130

How many times are the hands of a clock at right angle in a day? 44

The angle between the minute hand and the hour hand of a clock when the time is 8.30, is: 75

How many times in a day, are the hands of a clock in straight line but opposite in direction? 22

How many times do the hands of a clock coincide in a day? 22

How many times in a day, the hands of a clock are straight? 44

A clock is set right at 8 a.m. The clock gains 10 minutes in 24 hours what will be the true time when the clock indicates 1 p.m. on the following day?

Time from 8 a.m. on a day to 1 p.m. on the following day = 29 hours.
24 hours 10 min. of this clock = 24 hours of the correct clock.
145/6 hrs of this clock = 24 hours of the correct clock.
29 hours of this clock = $24*6/145* 29$ hrs of the correct clock
= 28 hrs 48 min of the correct clock.
Therefore, the correct time is 28 hrs 48 min. after 8 a.m.
This is 48 min. past 12.

48 min past 12

1. An accurate clock shows 8 o'clock in the morning. Through how may degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

A. 144º   B. 150º   C. 168º   D. 180º

ANS – D

2. The reflex angle between the hands of a clock at 10.25 is:

A. 180º   B. 192.5º   C. 195º   D. 197.5º

ANS – D

3. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

A.145º   B. 150º   C. 155º   D. 160º

ANS – C

4. How many times in a day, the hands of a clock are straight?

A. 22 B. 44 C. 24 D. 48

ANS – B

5. At 3.40, the hour hand and the minute hand of a clock form an angle of?

A. 120⁰ B. 130⁰ C. 125⁰ D. 135⁰

ANS – B

6. How many times do the hands of a clock coincide in a day ?

A. 24 B. 21 C. 20 D. 22

ANS – D

7. A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:

A.59 7/12 min. past 3   B.   4 p.m.   C.   58 7/11 min. past 3   D.   2 3/11 min. past 4

ANS – B

8. How much does a watch lose per day, if its hands coincide every 64 minutes?

A. 32 8/11 min.

B. 36 5/11 min.

C. 90 min.

D. 96 min.

ANS – A

55 minute spaces are covered in 60 minutes

60 minute spaces are covered in 60/55 *60 =   65   5 /11

Loss in 64 minutes

65 5/11 – 64 = 1 5 /11 = 16/11 min

Loss in 24 hours = 16 / 11 * 1 / 64 * 60* 24 = 32 8 / 11   option A

9. At what time between 7 and 8 o'clock will the hands of a clock be in the same straight line but, not together?

A. 5 min. past 7   B. 5 2/11 min. past 7   C. 5 3/11 min. past 7   D.5 5/11 min. past 7

ANS – D (formula 17)

10. At what time between 5.30 and 6 will the hands of a clock be at right angles?

A. 43 5/11 min. past 5   B. 43 7/11 min. past 5   C. 40 min. past 5   D. 45 min. past 5

ANS – B (formula 18)

11. The angle between the minute hand and the hour hand of a clock when the time is 4.20, is:

A. 0º   B. 10º   C. 5º   D. 20º

ANS – B

12. At what angle the hands of a clock are inclined at 15 minutes past 5?

A.58 ½ º   B. 64º   C. 67 ½ º   D. 72 ½ º

ANS – C

13. At 3:40, the hour hand and the minute hand of a clock form an angle of:

A. 120°   B. 125°   C. 130°   D. 135°

ANS – C

14. How many times are the hands of a clock at right angle in a day?

A. 22   B. 24   C. 44   D. 48

ANS – C

15. The angle between the minute hand and the hour hand of a clock when the time is 8.30, is:

A. 80º   B. 75º   C. 60º   D. 105º

ANS – B

16. How many times in a day, are the hands of a clock in straight line but opposite in direction?

A. 20   B. 22   C. 24 D. 48

ANS – B

17. At what time between 4 and 5 o'clock will the hands of a watch point in opposite directions?

A. 45 min. past 4   B. 40 min. past 4   C.50 4/11 min. past 4   D. 54 6/11 min. past 4

ANS – D (formula 17)

18. At what time between 9 and 10 o'clock will the hands of a watch be together?

A. 45 min. past 9   B. 50 min. past 9   C. 49 1/11 min. past 9   D. 48 2/11 min. past 9

ANS – C (formula 16)

19. At what time, in minutes, between 3 o'clock and 4 o'clock, both the needles will coincide each other?

A. 5 1/11"   B. 12 4/11"   C. 13 4/11"   D. 16 4/11"

ANS – D (formula 16)

20. How many times do the hands of a clock coincide in a day?

A. 20   B. 21   C. 22   D. 24

ANS – C