
CHAPTER 1

Clock

A When it comes to crafting logical reasoning questions for a competitive exam like CUET, a topic that can offer a plethora of possibilities is “Clocks.” Logical reasoning questions on clocks are not only intriguing but also test a candidate’s ability to apply deductive and analytical thinking.

1. Angle Calculation: Clocks are divided into 12 hours and 360 degrees. Questions that involve calculating the angle between the hour and minute hands at a particular time can be challenging. Here’s an example:

Question: Find the angle between the hour and minute hands of the clock at 5:45 PM.

2. Time Intervals: One fundamental concept in clock-related questions is calculating time intervals. You can have questions where candidates need to determine the time elapsed or remaining between two clock readings. For instance:

Question: If the time on a clock is 3:20 PM now, what will be the time after 110 minutes?

3. Mirror Image and Symmetry: Clock faces have a certain symmetry, and candidates can be tested on their ability to identify mirror images or symmetrical positions of clock hands. For instance:

Question: If the clock reads 6:30, what will be its mirror image?

4. Time Zones: Questions involving time zones can be quite challenging. CUET can ask candidates to calculate the time difference between two cities given their respective time zones. Example:

Question: If New York is 5 hours behind London, and it’s 12:00 PM in London, what time is it in New York?

5. Logical Sequences: To make questions more intricate, CUET Exam can introduce logical sequences related to clocks. Candidates might need to decipher patterns and predict future clock readings. Here’s an example:

Question: If the clock follows a pattern where the hour hand moves 45 degrees clockwise every hour, what will be the position of the hour hand at 7:30?

Note:- Candidate should focus more on topic 1,2, and 4.

Illustration or Solved Questions

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

(a) 144° (b) 150° (c) 168° (d) 180°

Solutions:

Angle traced by the hour hand in 6 hours = $\left(\frac{360}{12} \times 6\right)^\circ = 180^\circ$

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

(a) 145° (b) 150° (c) 155° (d) 160°

Solutions:

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

Angle traced by hour hand in 5 hrs 10 min. *i.e.*, $\frac{31}{6}$ hrs = $\left(\frac{360}{12} \times \frac{31}{6}\right)^\circ = 155^\circ$

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

(a) 0° (b) 10° (c) 5° (d) 20°

Solutions:

Angle traced by hour hand in $\frac{13}{3}$ hrs = $\left(\frac{360}{12} \times \frac{13}{3}\right)^\circ = 130^\circ$

Angle traced by min. hand in 20 min. = $\left(\frac{360}{60} \times 20\right)^\circ = 120^\circ$

∴ Required angle = $(130 - 120)^\circ = 10^\circ$.

4. 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°

Solutions:

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

Angle traced by it in $\frac{11}{3}$ hrs = $\left(\frac{360}{12} \times \frac{11}{3}\right)^\circ = 110^\circ$.

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

$$\text{Angle traced by it in 40 min.} = \left(\frac{360}{60} \times 40 \right)^\circ = 240^\circ.$$

∴ Required angle $(240 - 110)^\circ = 130^\circ$.

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

- (a) 22 (b) 24 (c) 44 (d) 48

Solutions:

In 12 hours, they are at right angles 22 times.

∴ In 24 hours, they are at right angles 44 times.

6. 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

Solutions:

The hands of a clock point in opposite directions (in the same straight line) 11 times in every 12 hours. (Because between 5 and 7 they point in opposite directions at 6 o'clock only).

So, in a day, the hands point in the opposite directions 22 times.

7. 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) $\frac{1}{11}$ min. past 9 (d) $\frac{2}{11}$ min. past 9

Solutions:

To be together between 9 and 10 o'clock, the minute hand has to gain 45 min. spaces.

55 min. spaces gained in 60 min.

45 min. spaces are gained in $\left(\frac{60}{55} \times 45 \right)$ min or $49 \frac{1}{11}$ min.

∴ The hands are together at $49 \frac{1}{11}$ min. past 9.

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

- (a) 20 (b) 21 (c) 22 (d) 24

Solutions:

The hands of a clock coincide 11 times in every 12 hours (Since between 11 and 1, they coincide only once, i.e., at 12 o'clock).

AM

12:00
 1:05
 2:11
 3:16
 4:22
 5:27
 6:33
 7:38
 8:44
 9:49
 10:55

PM

12:00
 1:05
 2:11
 3:16
 4:22
 5:27
 6:33
 7:38
 8:44
 9:49
 10:55

The hands overlap about every 65 minutes, not every 60 minutes.

∴ The hands coincide 22 times in a day.

9. A watch which gains uniformly is 2 minutes low at noon on Monday and is 4 min. 48 sec fast at 2 p.m. on the following Monday. When was it correct?

- (a) 2 p.m. on Tuesday
- (c) 3 p.m. on Thursday

- (b) 2 p.m. on Wednesday
- (d) 1 p.m. on Friday

Solutions:

Time from 12 p.m. on Monday to 2 p.m. on the following Monday = 7 days 2 hours = 170 hours.

∴ The watch gains $\left(2 + 4\frac{4}{5}\right)_{\text{min.}}$ or $\frac{34}{5}$ min. in 170 hrs.

Now $\frac{34}{5}$ min. are gained in 170 hrs.

∴ 2 min. are gained in $\left(170 \times \frac{5}{34} \times 2\right)_{\text{hrs}} = 50$ hrs.

∴ Watch is correct 2 days 2 hrs. after 12 p.m. on Monday *i.e.*, it will be correct at 2 p.m. on Wednesday.

Practice Questions

TYPE - I

1. What angle is made by clock hour hand in 12:00 PM to 3:45 PM?
 (a) 100.5° (b) 112.5° (c) 125° (d) 225°
2. What angle is made by minute hand in 30 second?
 (a) 120° (b) 1740° (c) 30° (d) 3°
3. What angle is made by minute hand in 90 second?
 (a) 90° (b) 9° (c) 180° (d) 18°
4. What angle is made by hour hand in 48 second?
 (a) $\frac{4^\circ}{3}$ (b) $\frac{2^\circ}{5}$ (c) $\frac{1^\circ}{10}$ (d) None of these
5. What angle is between minute and hour hand at 6:26?
 (a) 37° (b) 39.5° (c) 48° (d) 29°
6. What is the angle between minute and hour hand at 07:09?
 (a) 160° (b) 166° (c) 160.5° (d) 177.5°
7. What is the opposite angle between minute and hour hand at 09:31?
 (a) 99.5° (b) 260.5° (c) 215° (d) 66°
8. What is the opposite angle between minute and hour hand at 11:21?
 (a) 188.5° (b) 214.5° (c) 110° (d) 145.5°

TYPE - II

9. At what time between 6 to 7 O'clock minute and hour hand will coincide?
 (a) $6:38 \frac{2}{11}$ (b) $6:43 \frac{7}{11}$ (c) $6:32 \frac{8}{11}$ (d) $6:5 \frac{5}{11}$
10. At what time between 1 to 2 O'clock minute and hour hand will coincide or makes 0 angle?
 (a) $1:54 \frac{5}{11}$ (b) $1:5 \frac{5}{11}$ (c) $1:40 \frac{5}{11}$ (d) $1:48 \frac{5}{11}$
11. At what time between 7 to 8 O'clock minute and hour hand will be makes 30° angle?
 (a) $7:43 \frac{7}{11}$ and $7:30$ (b) $7:20$ and $7:12 \frac{4}{11}$
 (c) $7:14 \frac{1}{11}$ and $7:16 \frac{3}{11}$ (d) $7:32 \frac{8}{11}$ and $7:43 \frac{7}{11}$

12. At what time between 2 to 3 O'clock minute and hour hand will be at right angle to each other or makes 90° angle?

- (a) $2 : 32 \frac{8}{11}$ (b) $2 : 27 \frac{3}{11}$ (c) $2 : 10 \frac{10}{11}$ (d) $2 : 16 \frac{4}{11}$

13. At what time between 6 to 7 O'clock minute and hour hand will be at right angle or makes 90° angle?

- (a) $6 : 32 \frac{8}{11}$, $6 : 43 \frac{7}{11}$ (b) $6 : 43 \frac{7}{11}$, $6 : 49 \frac{1}{11}$
 (c) $6 : 49 \frac{1}{11}$, $6 : 16 \frac{4}{11}$ (d) $6 : 16 \frac{4}{11}$, $6 : 45 \frac{6}{11}$

14. At what time between 3 to 4 O'clock minute and hour hand are opposite to each other or makes 180° angle?

- (a) $3 : 43 \frac{7}{11}$ (b) $3 : 38 \frac{2}{11}$ (c) $3 : 49 \frac{1}{11}$ (d) $3 : 45 \frac{6}{11}$

15. At what time between 1 to 2 O'clock minute and hour hand will be at right angle to each other or makes 90° angle?

- (a) $1 : 45 \frac{6}{11}$ and $1 : 21 \frac{9}{11}$ (b) $1 : 44 \frac{6}{11}$ and $1 : 15 \frac{10}{11}$
 (c) $1 : 21 \frac{9}{11}$ (d) $1 : 44 \frac{6}{11}$

16. $7 : 46 \frac{4}{11}$ O'clock, find angle?

- (a) 45° (b) 51° (c) 120° (d) 111.5°

17. At what time between 12 to 1 O'clock minute and hour hand will be makes 240° angle?

- (a) $12 : 21 \frac{7}{11}$ (b) $12 : 21 \frac{9}{11}$ (c) $12 : 37 \frac{10}{11}$ (d) $12 : 25 \frac{9}{11}$

18. At what time between 8 to 9 O'clock the minute and hour hand will apart 7 minutes to each other?

- (a) $8 : 42, 8 : 51 \frac{3}{11}$ (b) $8 : 36, 8 : 51 \frac{3}{11}$
 (c) $8 : 09, 8 : 47 \frac{4}{11}$ (d) $8 : 17, 8 : 28 \frac{9}{11}$

19. At what time between 9: 30 to 10 O'clock minute and hour will be at right angle or makes 90° angle?

- (a) $9 : 65 \frac{5}{11}$ (b) $9 : 32 \frac{8}{11}$ (c) $9 : 29 \frac{4}{11}$ (d) None of these

20. A clock is set right at 10 a.m. It loses 8 minutes in 24 hours. What is the correct time when the clock indicates 9 p.m. on next Sunday?
- (a) 9 p.m. (b) 9 a.m. (c) 10 a.m. (d) 10 p.m.
21. A watch which gains uniformly is 4 minutes slow at 9 a.m. on Sunday & is 3 minutes fast at 8 p.m. on upcoming Monday. When was it correct?
- (a) 5 a.m. Monday (b) 8 p.m. Sunday
(c) 1 a.m. Monday (d) 4 p.m. Monday
22. A watch which gains uniformly is 5 minutes slow at 5a.m. Tuesday & is 1 minute fast at 5 p.m. on Wednesday. When was it correct?
- (a) 5 p.m. Tuesday (b) 1 p.m. Wednesday
(c) 11 p.m. Tuesday (d) 11 a.m. Wednesday
23. A watch which loses uniformly is 3 minutes fast at 6 a.m. on Thursday and 7 minutes slow at 8 a.m. on upcoming Saturday. When was it correct?
- (a) 9 p.m. Friday (b) 11: 30 p.m. Friday
(c) 9 p.m. Thursday (d) 5 p.m. Friday

TYPE - III

24. A man goes out from his house between 7 to 8 a.m. and returns between 3 and 4 p.m. When he sees his watch, he finds that both the hands change their position with each other. When he goes out from his home?
- (a) $8 : 12 \frac{4}{13}$ a.m. (b) $7 : 18 \frac{6}{13}$ a.m. (c) $3 : 18 \frac{6}{13}$ a.m. (d) $8 : 18 \frac{6}{13}$ a.m.
25. A man goes out from his house between 9 to 10 am and returns between 5 and 6 p.m. When he sees his watch, he finds that both the hands change their position with each other. When he has come home?
- (a) $5 : 44 \frac{11}{13}$ p.m. (b) $9 : 27 \frac{9}{13}$ p.m. (c) $5 : 27 \frac{9}{13}$ p.m. (d) $5 : 46 \frac{2}{13}$ p.m.
26. If the time in clock is 12: 23. What is the time in the mirror?
- (a) 12: 33 (b) 11: 37 (c) 12: 37 (d) 01: 23
27. If reflecting time is 3: 43, then the real time of clock is?
- (a) 3: 17 (b) 7: 17 (c) 8: 43 (d) 8: 17
28. Time in a clock is 3: 13. What time will be appeared in water?
- (a) 3: 17 (b) 3: 23 (c) 2: 17 (d) 2: 13
29. Time appears in water is 5: 47. What will be correct time in watch?
- (a) 12: 47 (b) 1: 47 (c) 12: 43 (d) 1: 43
30. If time in a clock is 8: 52, then at what time will appear in water?
- (a) 8: 38 (b) 8: 22 (c) 9: 52 (d) 9: 38

(ANSWER KEY)

CLOCK: -

1	2	3	4	5	6	7	8	9	10
B	D	B	B	A	C	B	D	C	B
11	12	13	14	15	16	17	18	19	20
D	B	C	C	A	A	B	B	B	E
21	22	23	24	25	26	27	28	29	30
A	D	C	B	D	B	D	A	C	D



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