Loops and Conditions

Standard difficulty · 20 questions · 40 marks · Time: 37 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. Repeating a set of steps again and again is called a:

(a) condition **(b)** pixel **(c)** bug **(d)** loop

2. Start with n = 8.
While n is 114 or less: say n, then add 6 to n.
How many numbers are said?

(a) 18 **(b)** 17 **(c)** 19 **(d)** 20

3. x = 1
Repeat 7 times: x = x + 11
What is x at the end?

(a) 89 **(b)** 77 **(c)** 67 **(d)** 78

4. Repeat 5 times:
Repeat 2 times: clap
Then stamp once
How many stamps in all?

(a) 2 **(b)** 7 **(c)** 5 **(d)** 10

5. A drawing robot follows: repeat ___ times (move forward 15 steps, turn right 45°). It ends where it started, facing the same way, after drawing a closed shape. How many times must it repeat?

(a) 7 **(b)** 8 **(c)** 9 **(d)** 16

6. x = 78
Repeat 4 times:
If x is even, x = x ÷ 2
Otherwise, x = x + 1
What is x at the end?

(a) 9 **(b)** 10 **(c)** 20 **(d)** 11

7. Count from 1 to 39. For each number:
If it is a multiple of both 7 and 6, say "Clap-Jump"
Else if it is a multiple of 7, say "Clap"
Else if it is a multiple of 6, say "Jump"
Otherwise say the number.
How many times do you say "Clap" (only)?

(a) 5 **(b)** 4 **(c)** 6 **(d)** 0

8. Zoya's box has ₹0.
While the box has less than ₹485: add ₹40 and count one day.
How many days are counted?

(a) 15 **(b)** 14 **(c)** 12 **(d)** 13

Section B — Short answer — 8 × 2 = 16 marks

9. What is a loop? Give an example from daily life.

10. Start with n = 13.
While n is 88 or less: say n, then add 6 to n.
How many numbers are said?

11. x = 172
Repeat 20 times: x = x − 7
What is x at the end?

12. Repeat 6 times:
Repeat 3 times: clap
Then stamp once
How many claps in all?

13. A drawing robot follows: repeat 3 times (move forward 30 steps, turn right 120°). How many steps does it move in all?

14. x = 64
Repeat 4 times:
If x is even, x = x ÷ 2
Otherwise, x = x + 5
What is x at the end?

15. Count from 1 to 34. For each number:
If it is a multiple of both 3 and 5, say "Clap-Jump"
Else if it is a multiple of 3, say "Clap"
Else if it is a multiple of 5, say "Jump"
Otherwise say the number.
How many times do you say "Clap" (only)?

16. Tara's box has ₹25.
While the box has less than ₹620: add ₹45 and count one day.
How many days are counted?

Section C — Word problems 4 × 4 = 16 marks

17. A robot draws using "repeat N times: move forward 20, turn right T°". (a) What N and T draw a square? (b) An equilateral triangle? (c) Why must N × T be 360?

18. (a) Start with n = 18.
While n is 84 or less: say n, then add 4 to n.
How many numbers are said?
(b) Isha's box has ₹30.
While the box has less than ₹745: add ₹50 and count one day.
How many days are counted?

19. (a) Repeat 5 times:
Repeat 5 times: clap
Then stamp once
How many claps in all?
(b) A drawing robot follows: repeat 8 times (move forward 15 steps, turn right ___°). It draws a regular octagon. What angle fills the gap?

20. (a) x = 5
Repeat 24 times: x = x + 12
What is x at the end?
(b) x = 72
Repeat 4 times:
If x is even, x = x ÷ 2
Otherwise, x = x + 5
What is x at the end?

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Answer key

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Q	Answer	Working
1	**(d) loop**	—
2	**(a) 18**	8, 14, …, 110: (110 − 8) ÷ 6 + 1 = 18
3	**(d) 78**	1 + 7 × 11
4	**(c) 5**	one stamp per round, 5 rounds
5	**(b) 8**	8 × 45° = 360°
6	**(b) 10**	78 → 39 → 40 → 20 → 10
7	**(a) 5**	multiples of 42 (both): 0; of 7: 5; of 6: 6
8	**(d) 13**	₹0 + 13 × ₹40 = ₹520, which is the first total of ₹485 or more
9	**Repeating steps again and again, e.g. stirring a pot "until the sugar dissolves" or doing 10 skips.**	—
10	**13**	13, 19, …, 85: (85 − 13) ÷ 6 + 1 = 13
11	**32**	172 − 20 × 7
12	**18**	3 claps in each of 6 rounds = 6 × 3
13	**90**	3 × 30
14	**4**	64 → 32 → 16 → 8 → 4
15	**9**	multiples of 15 (both): 2; of 3: 11; of 5: 6
16	**14**	₹25 + 14 × ₹45 = ₹655, which is the first total of ₹620 or more
17	**(a) N = 4, T = 90. (b) N = 3, T = 120. (c) To close the shape the robot must turn through one full turn, 360°, in total.**	—
18	**(a) 17; (b) 15**	(a) 18, 22, …, 82: (82 − 18) ÷ 4 + 1 = 17; (b) ₹30 + 15 × ₹50 = ₹780, which is the first total of ₹745 or more
19	**(a) 25; (b) 45°**	(a) 5 claps in each of 5 rounds = 5 × 5; (b) the turns add up to one full turn: 360° ÷ 8
20	**(a) 293; (b) 14**	(a) 5 + 24 × 12; (b) 72 → 36 → 18 → 9 → 14