Conditions and Loops

Standard difficulty · 20 questions · 40 marks · Time: 42 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. list(range(1, 5)) gives:

(a) [0, 1, 2, 3, 4] **(b)** [2, 3, 4, 5]

(c) [1, 2, 3, 4, 5] **(d)** [1, 2, 3, 4]

2. What does this print?

```
marks = 86
if marks >= 85:
    print('A')
elif marks >= 75:
    print('B')
elif marks >= 60:
    print('C')
else:
    print('D')
```

(a) D **(b)** C **(c)** B **(d)** A

3. What does this print?

```
s = 0
for i in range(8, 13, 4):
    s = s + i
print(s)
```

(a) 21 **(b)** 33 **(c)** 20 **(d)** 8

4. What does this print?

```
n = 148
count = 0
while n > 3:
    n = n // 2
    count = count + 1
print(count)
```

(a) 7 **(b)** 6 **(c)** 5 **(d)** 74

5. What does this print?

```
print(list(range(5, 15, 4)))
```

(a) [5, 9, 13, 17] **(b)** [9, 13] **(c)** [5, 9, 13] **(d)** [9, 13, 17]

6. What does this print?

```
x = 23
if x > 19:
    if x % 2 == 0:
        print('big even')
    else:
        print('big odd')
else:
    print('small')
```

(a) big even **(b)** small **(c)** big odd **(d)** nothing

7. How many numbers does this print?

```
for i in range(1, 43):
    if i % 9 == 0:
        print(i)
```

(a) 4 **(b)** 5 **(c)** 42 **(d)** 3

8. This program should print 1 + 2 + … + 18 = 171, but prints 172. Which change fixes it?

```
n = 18
s = 1
for i in range(1, n + 1):
    s = s + i
print(s)
```

(a) change s = s + i to s = s * i **(b)** change n to n + 1 in the first line

(c) change s = 1 to s = 0 **(d)** change print(s) to print(i)

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

9. What is the difference between a for loop and a while loop?

10. What does this print?

```
s = 0
for i in range(6, 12):
    s = s + i * i
print(s)
```

11. What does this print?

```
x = 9
while x < 1861:
    x = x * 9
print(x)
```

12. What does this print?

```
age = 23
if age >= 16:
    print('Can apply')
else:
    print('Not yet')
```

13. How many times is Hello printed?

```
for i in range(2):
    for j in range(7):
        print('Hello')
```

14. Write the values that i takes, separated by commas.

```
for i in range(7, 37, 5):
    print(i)
```

15. What numbers does this print? Write them separated by commas.

```
for i in range(1, 25):
    if i % 4 == 3:
        print(i)
```

16. What does this print?

```
nums = [20, 36, 52, 42, 33, 45]
total = 0
for x in nums:
    if x > 25:
        total = total + x
print(total)
```

Section C — Word problems — 4 × 4 = 16 marks

17. Write a program to print the grade of a student: A for 90 and above, B for 75 to 89, C for 60 to 74 and D below 60.

18. Trace this program.

```
n = 52784
s = 0
count = 0
while n > 0:
    s = s + n % 10
    n = n // 10
    count = count + 1
print(s, count)
```

(a) What is s at the end? (b) What is count? (c) What is s after the first pass?

19. This program should print the first 7 even numbers starting from 2.

```
for i in range(2, 14, 2):
    print(i)
```

(a) Write the numbers it actually prints. (b) How many numbers is that? (c) What is the smallest stop value for range that prints all 7 numbers?

20. What does this program print?

```
n = 12
for i in range(1, 10):
    print(n * i)
```

(a) What is the first number printed? (b) the last? (c) the sum of all the numbers printed?

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Answer key

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Q	Answer	Working
1	**(d) [1, 2, 3, 4]**	—
2	**(d) A**	the first true condition wins: 86
3	**(c) 20**	i = 8, 12 (13 is not included)
4	**(b) 6**	n ends at 2
5	**(c) [5, 9, 13]**	start at 5, add 4, stop before 15
6	**(c) big odd**	23 > 19 is true
7	**(a) 4**	multiples of 9 up to 42
8	**(c) change s = 1 to s = 0**	s must start at 0
9	**A for loop runs over a fixed sequence (like a range); a while loop repeats as long as a condition is True.**	—
10	**451**	i = 6, 7, 8, 9, 10, 11
11	**6561**	9 → 81 → 729 → 6561
12	**Can apply**	23 >= 16 is true
13	**14**	2 × 7
14	**7, 12, 17, 22, 27, 32**	start 7, step 5, stop before 37
15	**3, 7, 11, 15, 19, 23**	numbers up to 24 leaving remainder 3 on division by 4
16	**208**	numbers above 25: 36, 52, 42, 33, 45
17	**if m >= 90: print("A") elif m >= 75: print("B") elif m >= 60: print("C") else: print("D").**	—
18	**(a) 26; (b) 5; (c) 4**	last digits: 4, 8, 7, 2, 5
19	**(a) 2, 4, 6, 8, 10, 12; (b) 6; (c) 15**	range stops before its stop value, so it must be more than 14
20	**(a) 12; (b) 108; (c) 540**	12 × (1 + 2 + … + 9)