Flow of Control

Standard difficulty · 20 questions · 40 marks · Time: 40 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. In Python, the statements inside an if block are marked by:

(a) the keyword end **(b)** semicolons

(c) curly brackets **(d)** indentation

2. What does this program print?

```
temp = 41
if temp < 20:
    print('cold')
elif temp <= 34:
    print('pleasant')
else:
    print('hot')
```

(a) hot **(b)** cold **(c)** pleasant **(d)** cold pleasant

3. What does this program print?

```
s = 0
for i in range(7):
    s = s + i
print(s)
```

(a) 15 **(b)** 28 **(c)** 21 **(d)** 22

4. What does this program print?

```
n = 367
count = 0
while n > 4:
    n = n // 2
    count = count + 1
print(count, n)
```

(a) 7 4 **(b)** 7 2 **(c)** 6 2 **(d)** 8 1

5. What does this program print?

```
print(list(range(1, 20, 4)))
```

(a) [2, 6, 10, 14, 18] **(b)** [5, 9, 13, 17, 21]

(c) [5, 9, 13, 17] **(d)** [1, 5, 9, 13, 17]

6. What does this program print?

```
for i in range(1, 30):
    if i * i > 246:
        break
print(i)
```

(a) 15 **(b)** 256 **(c)** 16 **(d)** 17

7. What does this program print?

```
c = 0
for i in range(7):
    for j in range(i, 7):
        c = c + 1
print(c)
```

(a) 28 **(b)** 35 **(c)** 27 **(d)** 29

8. This program should print 1 + 2 + … + 21 = 231, but it prints 21. Which change fixes it?

```
s = 0
for i in range(1, 22):
    s = s + 1
print(s)
```

(a) s = s + i should be s = s * i **(b)** change print(s) to print(i)

(c) change s = s + 1 to s = s + i **(d)** change range(1, 21) to range(1, 22)

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

9. What is the difference between break and continue?

10. What does this program print?

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

11. What does this program print?

```
x = 9
while x < 987:
    x = x * 9
print(x)
```

12. What does this program print?

```
x = 54
if x > 38:
    if x % 2 == 0:
        print('large even')
    else:
        print('large odd')
else:
    print('small')
```

13. What is printed on line 4 of the output?

```
for i in range(1, 5):
    for j in range(i):
        print(chr(65 + j), end='')
    print()
```

14. What does this program print?

```
n = 7
f = 1
for i in range(1, n + 1):
    f = f * i
print(f)
```

15. What does this program print? Give (a) the first number printed (b) the second.

```
n = 23
count = 0
while True:
    n = n + 7
    count = count + 1
    if n % 6 == 0:
        break
print(n, count)
```

16. What are a, b and c after these lines run?

```
a, b, c = 72, 52, 86
if a > b:
    a, b = b, a
if b > c:
    b, c = c, b
if a > b:
    a, b = b, a
```

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

17. Explain the if, if-else and if-elif-else statements with a flowchart idea and a program for each.

18. Trace this code.

```
i = 4
s = 0
while i <= 24:
    if i % 7 == 0:
        s = s + i
    i = i + 4
```

(a) What is s at the end? (b) What is i at the end? (c) How many times does the loop body run?

19. What does this program print when the user types (a) 45354 (b) 35363?

```
n = int(input())
r = 0
t = n
while t > 0:
    r = r * 10 + t % 10
    t = t // 10
if r == n:
    print('Palindrome')
else:
    print('Not a palindrome')
```

20. Write the numbers this program prints, in order.

```
n = 10
a, b = 0, 1
for i in range(n):
    print(a)
    a, b = b, a + b
```

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Answer key

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Q	Answer	Working
1	**(d) indentation**	—
2	**(a) hot**	41: the first true condition wins
3	**(c) 21**	i takes 0, 1, 2, 3, 4, 5, 6 (the stop value 7 is not included)
4	**(b) 7 2**	n ends at 2 after 7 passes
5	**(d) [1, 5, 9, 13, 17]**	start at 1, add 4, stop before 20
6	**(c) 16**	16 × 16 = 256 is the first square above 246
7	**(a) 28**	count the passes of the inner loop for each i
8	**(c) change s = s + 1 to s = s + i**	it adds 1 each time instead of i
9	**break leaves the loop completely; continue skips the rest of the current pass and starts the next one.**	—
10	**451**	i = 6, 7, 8, 9, 10, 11
11	**6561**	9 → 81 → 729 → 6561
12	**large even**	54 > 38 is true
13	**ABCD**	line 4 has the first 4 capital letters
14	**5040**	1 × 2 × 3 × 4 × 5 × 6 × 7
15	**(a) 30; (b) 1**	the loop stops at the first multiple of 6
16	**a = 52, b = 72, c = 86**	each swap puts the smaller value first: the three numbers end up sorted
17	**if runs a block when a condition is True; if-else chooses one of two blocks; if-elif-else checks conditions in turn, e.g. grades from marks.**	—
18	**(a) 0; (b) 28; (c) 6**	i: 4, 8, 12, 16, 20, 24; multiples of 7 added
19	**(a) Palindrome; (b) Not a palindrome**	it compares n with the digits reversed
20	**0, 1, 1, 2, 3, 5, 8, 13, 21, 34**	each term is the sum of the two before it