Model Questions (Variables, Data Types, Arithmetic / Assignment / Comparison / Logical Operators Only)

Question 1

```
a = 12
b = 5
c = 2.5
d = 4
```

Compute:

1. `a + b * d`
2. `(a + b) * d`
3. `a / b + c`
4. `a % b * c`
5. Is `a + b > d * c` a `True` or `False` boolean?

Question 2

```
x = 3
y = 4
z = 2
```

Using assignment (including augmented assignment) perform:

- `x = x + y`
- `y *= z`
- `z -= x`

Then compute:

- Is `x > y`?
- Is `z <= 0`?

Question 3

```
p = 10
q = 3
r = 4.5
s = 2
```

Compute:

1. `p ** s`
2. `q // s`
3. `q / s + r`
4. `p % q * s`
5. Boolean value of `(p > q) and (r < s)`

Question 4

```
alpha = 7
beta = 2
gamma = 5.0
```

Perform:

- `result1 = alpha * beta + gamma`
- `result2 = alpha * (beta + gamma)`

Then compute:

1. `result1 == result2`
2. `result1 != alpha + beta + gamma`

Question 5

```
m = 8
n = 3
```

Compute:

- `m = m + n` (use assignment)
- `difference = m - n`
- `product = m * n`
- quotient, floor-quotient, remainder of `m / n`
- Evaluate:
    - `difference > product`
    - `product >= remainder + floor-quotient`

Question 6

```
x = 8
y = 3
z = 7.5
```

Compute:

1. `x * y + z`
2. `z - y * x`
3. `(x + y) / 2`
4. `x % y == 2`
5. `type(x * z)` — what data type is that?

Question 7

```
a = 5
b = 2
```

Using assignment operators in sequence:

- `a += b`
- `b *= a`
- `a -= 4`
- `b /= 3`

Also compute:

- Is `a > b`?
- Is `b >= a`?

Question 8

```
m = 4
n = 4.0
p = 9
```

Calculate:

1. `m ** 2 + p`
2. `n // m`
3. `p / m + n`
4. Check whether `m == n` is `True` or `False`
5. Check whether `(p > m) and (n < p)`

Question 9

```
name = "Kumara"
age = 20
height = 1.75
```

Compute:

- `age * 365` — days lived approximately

- `height * height`
- Concatenation: `name + " is " + str(age) + " years old."`
- Boolean: `age > 18`
- Boolean: `(age > 18) and (height > 1.7)`

Question 10

```
val1 = 10
val2 = 3
```

Compute:

- `val1 / val2`
- `val1 // val2`
- `val1 % val2`
- `val1 * val2`
- Is `(val1 % val2) == 1`?
- Is `(val1 // val2) > (val2)`?

☑ Answer Key (Worked Solutions)

Answers for Question 1

Given: `a = 12, b = 5, c = 2.5, d = 4`

1. `a + b * d` → `12 + (5 * 4)` = `12 + 20` = **32**
2. `(a + b) * d` → `(12 + 5) * 4` = `17 * 4` = **68**
3. `a / b + c` → `12 / 5 + 2.5` = `2.4 + 2.5` = **4.9**
4. `a % b * c` → `(12 % 5) * 2.5` = `2 * 2.5` = **5.0**
5. `a + b > d * c` → `12 + 5 > 4 * 2.5` → `17 > 10` → **True**

Answers for Question 2

Given: `x = 3`, `y = 4`, `z = 2`

- `x = x + y` → `x = 3 + 4` → now `x = 7`
- `y *= z` → `y = 4 * 2` → now `y = 8`
- `z -= x` → `z = 2 – 7` → now `z = -5`

Then:

- Is `x > y`? → `7 > 8` → **False**
- Is `z <= 0`? → `-5 <= 0` → **True**

Answers for Question 3

Given: `p = 10`, `q = 3`, `r = 4.5`, `s = 2`

1. `p ** s` → `10 ** 2` = **100**
2. `q // s` → `3 // 2` = **1** (floor division)
3. `q / s + r` → `3 / 2 + 4.5` = `1.5 + 4.5` = **6.0**
4. `p % q * s` → `(10 % 3) * 2` = `1 * 2` = **2**
5. `(p > q) and (r < s)` → `(10 > 3) and (4.5 < 2)` → `True and False` → **False**

Answers for Question 4

Given: `alpha = 7`, `beta = 2`, `gamma = 5.0`

- `result1 = alpha * beta + gamma` → `7 * 2 + 5.0` = `14 + 5.0` = **19.0**
- `result2 = alpha * (beta + gamma)` → `7 * (2 + 5.0)` = `7 * 7.0` = **49.0**

Then:

1. `result1 == result2` → `19.0 == 49.0` → **False**
2. `result1 != alpha + beta + gamma` → compare `19.0 != (7 + 2 + 5.0)` → `19.0 != 14.0` → **True**

Answers for Question 5

Given: `m = 8`, `n = 3`

- `m = m + n` → `m = 8 + 3` → now `m = 11`
- `difference = m - n` → `11 – 3` = **8**
- `product = m * n` → `11 * 3` = **33**
- quotient, floor-quotient, remainder of `m / n`:

quotient = `m / n` = `11 / 3` ≈ **3.6666666667**

floor-quotient = `m // n` = **3**

remainder = `m % n` = `11 % 3` = **2**

- Evaluate:
  - `difference > product` → `8 > 33` → **False**
  - `product >= remainder + floor-quotient` → `33 >= 2 + 3` → `33 >= 5` → **True**

Answers for Question 6

Given: `x = 8`, `y = 3`, `z = 7.5`

1. `x * y + z` → `8 * 3 + 7.5` = `24 + 7.5` = **31.5**
2. `z - y * x` → `7.5 – (3 * 8)` = `7.5 – 24` = **–16.5**
3. `(x + y) / 2` → `(8 + 3) / 2` = `11 / 2` = **5.5**
4. `x % y == 2` → `8 % 3 == 2` → `2 == 2` → **True**
5. `type(x * z)` → `8 * 7.5` = `60.0` → type is **float**

Answers for Question 7

Given: `a = 5`, `b = 2`

- `a += b` → `a = 5 + 2` → now `a = 7`

- `b *= a` → `b = 2 * 7` → now `b = 14`
- `a -= 4` → `a = 7 - 4` → now `a = 3`
- `b /= 3` → `b = 14 / 3` ≈ **4.6666666667**

Then:

- Is `a > b`? → `3 > 4.6667` → **False**
- Is `b >= a`? → `4.6667 >= 3` → **True**

Answers for Question 8

Given: `m = 4`, `n = 4.0`, `p = 9`

1. `m ** 2 + p` → `4 ** 2 + 9` = `16 + 9` = **25**
2. `n // m` → `4.0 // 4` = **1.0** (floor division, but since n is float, result float)
3. `p / m + n` → `9 / 4 + 4.0` = `2.25 + 4.0` = **6.25**
4. `m == n` → `4 == 4.0` → **True**
5. `(p > m) and (n < p)` → `(9 > 4) and (4.0 < 9)` → `True and True` → **True**

Answers for Question 9

Given: `name = "Kumara"`, `age = 20`, `height = 1.75`

- `age * 365` → `20 * 365` = **7300** (integer)
- `height * height` → `1.75 * 1.75` = **3.0625** (float)
- Concatenation: `name + " is " + str(age) + " years old."` → **"Kumara is 20 years old."**
- Boolean: `age > 18` → `20 > 18` → **True**
- Boolean: `(age > 18) and (height > 1.7)` → `True and (1.75 > 1.7)` → `True and True` → **True**

Answers for Question 10

Given: `val1 = 10`, `val2 = 3`

- `val1 / val2` → `10 / 3` ≈ **3.3333333333**
- `val1 // val2` → **3** (floor division)
- `val1 % val2` → **1** (remainder)
- `val1 * val2` → **30**
- Is `(val1 % val2) == 1`? → `1 == 1` → **True**
- Is `(val1 // val2) > (val2)`? → `3 > 3` → **False**