Python Operators Overview & Practice Questions

Quick Reference

Arithmetic Operators

```python
+   Addition           # 5 + 3 = 8
-   Subtraction        # 5 - 3 = 2
*   Multiplication     # 5 * 3 = 15
**  Exponentiation     # 5 ** 3 = 125
/   Division           # 5 / 2 = 2.5
//  Floor Division     # 5 // 2 = 2
%   Modulo/Remainder   # 5 % 2 = 1
```

Assignment Operators

```python
=   Assign             x = 5
+=  Add & assign      x += 3  # x = x + 3
-=  Subtract & assign x -= 3  # x = x - 3
*=  Multiply & assign x *= 3  # x = x * 3
/=  Divide & assign   x /= 3  # x = x / 3
```

Comparison Operators

```python
==  Equal to              # 5 == 5 → True
!=  Not equal to          # 5 != 3 → True
```

```
>   Greater than          # 5 > 3 → True
<   Less than             # 5 < 3 → False
>=  Greater than or equal # 5 >= 5 → True
<=  Less than or equal    # 5 <= 3 → False
```

Logical Operators

```
python

and   Both conditions true  # (5>3) and (2<4) → True
or    Either condition true # (5>3) or (2>4) → True
not   Reverse the result    # not(5>3) → False
```

Practice Questions (20 Problems)

Basic Calculations (1-5):

1. **Temperature Conversion**: Convert 98.6°F to Celsius using: C = (F - 32) × 5/9
2. **Circle Calculations**: Calculate area and circumference of a circle with radius 7.5 cm
3. **BMI Calculator**: Calculate BMI for weight=68kg, height=1.75m (BMI = weight/height^2)
4. **Time Converter**: Convert 5678 seconds to hours, minutes, and remaining seconds
5. **Compound Interest**: Calculate final amount for ₹5000 at 8% annual interest for 3 years: A = P(1 + r/100)^t

Logical Operations (6-10):

6. **Eligibility Check**: Check if a person aged 22 with 85% marks is eligible for a job (age≥21 and marks≥80)
7. **Discount Eligibility**: Check if a customer with ₹2500 purchase on a weekend gets 15% discount (purchase≥2000 or weekend=True)
8. **Login System**: Validate username="admin" and password="12345" or recovery_email=True
9. **Grade Check**: Student passes if (attendance≥75 and marks≥40) or medical_excuse=True
10. **Triangle Validator**: Check if sides 7, 10, 5 can form a triangle (sum of any two > third)

Mixed Operations (11-15):

11. **Number Properties**: For number 29, check if it's positive, even, and divisible by 3
12. **Leap Year Checker**: Check if 2024 is a leap year (divisible by 4 and not by 100, unless also divisible by 400)
13. **Shipping Cost**: Calculate cost: ₹50 base + ₹20/kg for weight>5kg, with 10% discount for online orders
14. **Data Usage**: Calculate remaining data from 10GB plan after using 2.3GB, 1.7GB, and 0.8GB
15. **Password Strength**: Check if password has ≥8 chars, contains digit, and has special char (!@#$)

Challenge Problems (16-20):

16. **Quadratic Roots**: Calculate roots of $x^2 - 5x + 6 = 0$ using formula: $(-b \pm \sqrt{(b^2-4ac)})/(2a)$
17. **Number Reversal**: Reverse digits of 12345 without string conversion
18. **Prime Check**: Check if 97 is prime using modulo operator
19. **Digital Root**: Find digital root of 9876 (sum digits repeatedly until single digit)
20. **Currency Breakdown**: Break ₹8765 into ₹2000, ₹500, ₹200, ₹100, ₹50, ₹20, ₹10 notes