=== TOPIC: Python Programming, LEVEL: easy ===

1. What will be the output of the following Python code?

```
print(10 + 5 * 2)
```

A) 30

B) 20

C) 15

D) 25

Answer: B

2. Which of these is a valid variable name in Python?

A) 1number

B) my-number

C) total_count

D) class

Answer: C

3. What is the output of this code?

```
print(type("Hello"))
```

A) <class 'int'>

B) <class 'str'>

C) <class 'float'>

D) <class 'bool'>

Answer: B

4. What will be printed?

```
x = 7
print(x > 5 and x < 10)
```

A) True

B) False

C) 7

D) Error

Answer: A

5. Which operator is used for exponentiation in Python?

A) ^

B) **

C) //

D) %

Answer: B

6. What is the output?

```
print(15 // 4)
```

A) 3.75

B) 3

C) 4

D) 11

Answer: B

7. Which keyword is used to define a function in Python?

A) function

B) fun

C) def

D) define

Answer: C

8. What will be the output?

```
name = "Python"
print(name[1])
```

A) P

B) y

C) t

D) h

Answer: B

9. What is printed by this code?

```
print("Hello" + " " + "World")
```

A) HelloWorld

B) Hello World

C) Hello+World

D) Error

Answer: B

10. Which of these is NOT a valid data type in Python?

A) int

B) float

C) number

D) str

Answer: C

11. What is the output?

```
age = 20
print(age == 20)
```

A) 20

B) True

C) False

D) Error

Answer: B

12. What does this code print?

```
for i in range(3):
    print(i)
```

A) 0 1 2

B) 1 2 3

C) 0 1 2 3

D) 3 2 1

Answer: A

13. Which symbol is used for single-line comments in Python?

A) //

B) #

C) /*

D) --

Answer: B

14. What is the output?

```
x = 5
x = x + 3
print(x)
```

A) 5

B) 8

C) 53

D) Error

Answer: B

15. What will this code output?

```
print(len("Python"))
```

A) 5

B) 6

C) 7

D) Error

Answer: B

16. Which of these creates an empty list?

A) {}

B) []

C) ()

D) ""

Answer: B

17. What is printed?

```
fruits = ["apple", "banana"]
print(fruits[0])
```

A) apple

B) banana

C) fruits

D) Error

Answer: A

18. What does this code do?

```
x = 10
if x > 5:
    print("Big")
```

A) Prints Big

B) Prints nothing

C) Error

D) Prints 10

Answer: A

19. What is the output?

```
print(5 != 5)
```

A) True

B) False

C) 5

D) Error

Answer: B

20. Which function converts a string to uppercase?

A) upper()

B) toUpper()

C) uppercase()

D) Upper()

Answer: A

21. What will be printed?

```
print(bool(0))
```

A) True

B) False

C) 0

D) Error

Answer: B

22. What is the result of 9 % 4?

A) 2

B) 2.25

C) 1

D) 0

Answer: A

23. Which loop is used when you know the number of iterations?

A) while

B) for

C) do-while

D) repeat

Answer: B

24. What is printed?

```
text = "hi"
print(text * 3)
```

A) hihi

B) hihihi

C) hi hi hi

D) Error

Answer: B

25. What does this code output?

```
numbers = [1, 2, 3]
numbers.append(4)
print(numbers)
```

A) [1, 2, 3]

B) [1, 2, 3, 4]

C) [4, 1, 2, 3]

D) Error

Answer: B

26. What is the output?

```
print(2 ** 3)
```

A) 6

B) 8

C) 9

D) 5

Answer: B

27. Which keyword stops a loop immediately?

A) stop

B) break

C) exit

D) end

Answer: B

28. What will this print?

```
x = "10"
print(type(int(x)))
```

A) <class 'str'>

B) <class 'int'>

C) <class 'float'>

D) Error

Answer: B

29. What is the output?

```
a = 4
b = 6
print(a > b or a < b)
```

A) True

B) False

C) 4

D) Error

Answer: A

30. Which method removes the last item from a list?

A) remove()

B) pop()

C) delete()

D) clear()

Answer: B

31. What does this code print?

```
print("Hello".lower())
```

A) HELLO

B) hello

C) Hello

D) Error

Answer: B

32. What is printed?

```
count = 0
while count < 3:
    print(count)
    count += 1
```

A) 0 1 2

B) 1 2 3

C) 0 1 2 3

D) Infinite loop

Answer: A

33. Which of these is a correct way to create a string?

A) 'Hello'

B) "Hello"

C) '''Hello'''

D) All of the above

Answer: D

34. What is the output?

```
print(10 / 2)
```

A) 5

B) 5.0

C) 2

D) Error

Answer: B

35. What does this code do?

```
def greet():
    print("Hi!")
greet()
```

A) Prints Hi!

B) Error

C) Prints greet

D) Nothing

Answer: A

36. Which operator is used for floor division?

A) /

B) //

C) %

D) **

Answer: B

37. What will be printed?

```
colors = ["red", "blue"]
print("green" in colors)
```

A) True

B) False

C) green

D) Error

Answer: B

38. What is the output?

```
x = 8
if x % 2 == 0:
    print("Even")
```

```
  else:
      print("Odd")
```

A) Even

B) Odd

C) Error

D) Nothing

Answer: A

39. Which function returns the length of a list or string?

A) size()

B) length()

C) len()

D) count()

Answer: C

40. What is printed?

```
  print(range(5))
```

A) 0 1 2 3 4

B) range(0, 5)

C) [0,1,2,3,4]

D) Error

Answer: B

41. What does this code output?

```
  name = "alice"
  print(name.capitalize())
```

A) alice

B) Alice

C) ALICE

D) Error

Answer: B

42. What is the result?

```
print(3 + 4 * 2 - 5)
```

A) 6

B) 4

C) 9

D) 1

Answer: A

43. Which keyword is used to skip the current iteration in a loop?

A) continue

B) break

C) pass

D) skip

Answer: A

44. What will be printed?

```
lst = [10, 20, 30]
print(lst[-1])
```

A) 10

B) 20

C) 30

D) Error

Answer: C

45. What is the output?

```
print("Python"[2:5])
```

A) tho

B) yth

C) Pyth

D) hon

Answer: A

46. Which of these is used to check two values are equal?

A) =

B) ==

C) ===

D) equals

Answer: B

47. What does this code print?

```
x = 100
if x > 50:
    print("A")
elif x > 75:
    print("B")
else:
    print("C")
```

A) A

B) B

C) C

D) Error

Answer: A

48. What is printed?

```
print(str(25) + " years")
```

A) 25years

B) 25 years

C) Error

D) 25 + years

Answer: B

49. Which function adds all numbers in a list?

A) sum()

B) total()

C) add()

D) count()

Answer: A

50. What will be the output?

```
for char in "cat":
    print(char)
```

A) c a t

B) cat

C) c
a
t

D) Error

Answer: C

=== TOPIC: Python Programming, LEVEL: medium ===

1. What is the output of this code?

```
print([x**2 for x in range(5) if x % 2 == 0])
```

A) [0, 4, 16]

B) [1, 4, 9, 16]

C) [0, 1, 4, 9, 16]

D) [0, 2, 4, 6, 8]

Answer: A

2. What will be the value of `result`?

```
nums = [1, 2, 3, 4]
result = nums[-2:] + nums[:2]
```

A) [3, 4, 1, 2]

B) [2, 3, 4, 1]

C) [1, 2, 3, 4]

D) [4, 3, 2, 1]

Answer: A

3. Which line correctly creates a dictionary from two lists?

```
keys = ['a', 'b', 'c']
values = [1, 2, 3]
```

A) dict(keys, values)

B) {k: v for k, v in zip(keys, values)}

C) dict(zip(keys))

D) {keys: values}

Answer: B

4. What is printed by this code?

```
s = "python programming"
print(s.title().replace(" ", "_"))
```

A) Python_Programming

B) PYTHON_PROGRAMMING

C) python_programming

D) Python programming

Answer: A

5. What does this function return?

```
def mystery(n):
    return n > 0 and mystery(n-1) or 0
print(mystery(4))
```

A) 4

B) 10

C) 0

D) RecursionError

Answer: C

6. What is the output?

```
lst = [1, 2, 3]
lst.extend([4, 5])
print(len(lst), lst[3])
```

A) 5 4

B) 3 4

C) 5 5

D) 4 4

Answer: A

7. Which option correctly removes duplicates while preserving order?

```
items = [5, 2, 5, 3, 2, 8]
```

A) list(set(items))

B) [x for i, x in enumerate(items) if x not in items[:i]]

C) sorted(set(items))

D) list(dict.fromkeys(items))

Answer: D

8. What will be printed?

```
d = {'a': 1, 'b': 2}
d.update({'b': 3, 'c': 4})
print(d)
```

A) {'a': 1, 'b': 2, 'c': 4}

B) {'a': 1, 'b': 3, 'c': 4}

C) {'b': 3, 'c': 4}

D) Error

Answer: B

9. What is the result of this expression?

```
print("racecar"[::-1] == "racecar")
```

A) True

B) False

C) racecar

D) Error

Answer: A

10. What does this code output?

```
for i in range(3):
    for j in range(2):
        if j == 1:
            break
    print(i, end=" ")
```

A) 0 1 2

B) 0 0 1 1 2 2

C) 0 1 2 0 1 2

D) Infinite loop

Answer: A

11. What is printed?

```
x = [[]] * 3
x[0].append(99)
print(x)
```

A) [[99], [99], [99]]

B) [[99], [], []]

C) [[], [], [99]]

D) Error

Answer: A

12. Which code correctly counts vowels in a string?

```
text = "hello world"
```

A) sum(1 for c in text if c.lower() in 'aeiou')

B) text.count('a' or 'e' or 'i' or 'o' or 'u')

C) len([c for c in text if c in "aeiouAEIOU"])

D) Both A and C

Answer: D

13. What is the output?

```
def add(a, b=5):
    return a + b
print(add(3))
```

A) 8

B) 3

C) 5

D) Error

Answer: A

14. What does this code produce?

```
matrix = [[1,2],[3,4]]
print([row[1] for row in matrix])
```

A) [2, 4]

B) [[2], [4]]

C) [1, 3]

D) Error

Answer: A

15. What is printed?

```
s = "data"
print(s.center(10, "*"))
```

A) **data****

B) ****data**

C) **data**

D) data****

Answer: B

16. Which is the correct way to merge two dictionaries in Python 3.9+?

A) d1 + d2

B) d1 | d2

C) merge(d1, d2)

D) d1.extend(d2)

Answer: B

17. What is the output?

```
nums = [10, 20, 30, 40]
print(nums[1:3:-1])
```

A) [20, 30]

B) []

C) [30, 20]

D) [40, 30]

Answer: B

18. What does this function return?

```
def f(x):
    if x <= 0: return 1
    return x * f(x-2)
print(f(5))
```

A) 15

B) 120

C) 5

D) 60

Answer: A

19. What is printed?

```
a = {1, 2, 3}
b = {2, 3, 4}
print(a ^ b)
```

A) {1, 4}

B) {2, 3}

C) {1, 2, 3, 4}

D) {1}

Answer: A

20. What will be the value of `d`?

```
d = dict.fromkeys(['x','y','z'], 0)
d['x'] = 100
print(d)
```

A) {'x': 100, 'y': 0, 'z': 0}

B) {'x': 0, 'y': 0, 'z': 0}

C) {100, 0, 0}

D) Error

Answer: A

21. What is the output?

```
print(" ".join(["Python", "is", "fun"][::-1]))
```

A) fun is Python

B) Python is fun

C) fun is Python

D) Python fun is

Answer: A

22. Which code correctly flattens a list of lists?

```
nested = [[1,2], [3], [4,5]]
```

A) [x for sub in nested for x in sub]

B) nested.flatten()

C) sum(nested, [])

D) Both A and C

Answer: D

23. What is printed?

```
try:
    print(1 / 0)
except ZeroDivisionError:
    print(2)
finally:
    print(3)
```

A) 2 3

B) 1 2 3

C) 3

D) Error

Answer: A

24. What does this code output?

```
values = [10, 20, 30]
it = iter(values)
print(next(it), next(it))
```

A) 10 20

B) 20 30

C) 10 30

D) Error

Answer: A

25. What is the result?

```
print("mississippi".count("s"))
```

A) 2

B) 3

C) 4

D) 1

Answer: C

26. What will `result` be?

```
result = {k: v**2 for k, v in enumerate("abc")}
```

A) {'a':0, 'b':1, 'c':4}

B) {0:'a', 1:'b', 2:'c'}

C) {0: 'aa', 1: 'bb', 2: 'cc'}

D) Error

Answer: B

27. What is printed?

```
x = "hello"
y = x
x += " world"
print(y)
```

A) hello world

B) hello

C) world

D) Error

Answer: B

28. Which is the correct output?

```
lst = [1,2,3,4,5]
print(*lst[1:4], sep="-")
```

A) 2-3-4

B) 234

C) 1-2-3-4-5

D) Error

Answer: A

29. What does this code return?

```
def outer():
    x = 5
    def inner():
        nonlocal x
        x += 1
        return x
    return inner()
print(outer())
```

A) 5

B) 6

C) Error

D) None

Answer: B

30. What is printed?

```
from string import ascii_lowercase
print(ascii_lowercase[::3])
```

A) abcdefghijklmnopqrstuvwxyz

B) adgjmpsvy

C) acegikmoqsuwy

D) bdfhjlnprtvxz

Answer: B

31. What will be the output?

```
pairs = [(1,'a'), (2,'b'), (3,'c')]
print(dict(pairs))
```

A) {1: 'a', 2: 'b', 3: 'c'}

B) {'a':1, 'b':2, 'c':3}

C) [(1,'a'), (2,'b'), (3,'c')]

D) Error

Answer: A

32. What is the result?

```
print("Python".zfill(10))
```

A) Python0000

B) 0000Python

C) Python

D) 000Python0

Answer: B

33. What does this code output?

```
scores = [85, 92, 78, 95]
print(sorted(scores, reverse=True)[1])
```

A) 95

B) 92

C) 85

D) 78

Answer: B

34. What is printed?

```
def func(lst):
    lst = lst + [99]
nums = [1,2,3]
func(nums)
print(nums)
```

A) [1, 2, 3, 99]

B) [1, 2, 3]

C) [99]

D) Error

Answer: B

35. Which expression gives the second largest number?

```
nums = [7, 3, 8, 2, 8, 5]
```

A) sorted(set(nums))[-2]

B) sorted(nums)[-2]

C) max(nums - {max(nums)})

D) Both A and B

Answer: D

36. What is the output?

```
print("aabbcc".replace("a", "x", 1))
```

A) xxbbcc

B) xabbcc

C) xxbxcc

D) aabbcc

Answer: B

37. What will this code print?

```
i = 5
while i > 0:
    i -= 1
    if i == 3:
        continue
    print(i, end=" ")
```

A) 4 2 1 0

B) 4 3 2 1 0

C) 5 4 2 1 0

D) 4 3 2 1

Answer: A

38. What is the result?

```
print({1, 2, 2, 3, 3}.union({3, 4}))
```

A) {1, 2, 3, 4}

B) {1, 2, 3}

C) {3, 4}

D) Error

Answer: A

39. What does this code output?

```
text = "Python3.11"
print(''.join(c for c in text if c.isdigit()))
```

A) 311

B) 3.11

C) Python

D) 3

Answer: A

40. What is printed?

```
d = {}
d.setdefault('key', []).append(1)
d.setdefault('key', []).append(2)
print(d)
```

A) {'key': [1, 2]}

B) {'key': [2]}

C) {}

D) Error

Answer: A

41. What will be the output?

```
lst = list(range(10))
print(lst[2:8:2])
```

A) [2, 4, 6]

B) [2, 4, 6, 8]

C) [0, 2, 4, 6]

D) [8, 6, 4, 2]

Answer: A

42. Which is correct to reverse a list in place?

```
nums = [1,2,3,4]
```

A) nums = nums[::-1]

B) nums.reverse()

C) reversed(nums)

D) nums.sort(reverse=True)

Answer: B

43. What is the output?

```
print(" ".join(map(str, filter(lambda x: x%2==0, range(10)))))
```

A) 0 2 4 6 8

B) 1 3 5 7 9

C) 0 1 2 3 4

D) 2 4 6 8

Answer: A

44. What does this code produce?

```
def greet(name="Guest"):
    return f"Hello {name}"
print(greet("Alice"), greet())
```

A) Hello Alice Hello Guest

B) Hello Guest Hello Alice

C) Hello Alice Hello Alice

D) Error

Answer: A

45. What is printed?

```
s = "banana"
print(s.find("na", 3))
```

A) 4

B) 2

C) -1

D) 3

Answer: A

46. What will be the value of `total`?

```
total = sum(x for x in range(1, 11) if x % 3 != 0)
```

A) 45

B) 30

C) 33

D) 24

Answer: C

47. What is the output?

```
a = [1, 2]
b = a
a += [3]
print(b)
```

A) [1, 2]

B) [1, 2, 3]

C) [3]

D) Error

Answer: B

48. Which code correctly checks if a string is a palindrome?

```
word = "radar"
```

A) word == word[::-1]

B) word == reversed(word)

C) word == "".join(reversed(word))

D) Both A and C

Answer: D

49. What is printed?

```
print("{:.2f}".format(3.14159))
```

A) 3.14

B) 3.14159

C) 3.1

D) 3

Answer: A

50. What does this code output?

```
def fib(n):
    a, b = 0, 1
    for _ in range(n):
        print(a, end=" ")
        a, b = b, a + b
fib(6)
```

A) 0 1 1 2 3 5

B) 1 1 2 3 5 8

C) 0 1 2 3 5 8

D) 1 2 3 5 8 13

Answer: A

=== TOPIC: Python Programming, LEVEL: hard ===

1. What is printed by this code?

```
x = [1, 2, 3]
```

```
  y = x
  x += [4]
  print(y is x, y)
```

A) True [1, 2, 3, 4]

B) False [1, 2, 3, 4]

C) True [1, 2, 3]

D) False [1, 2, 3]

Answer: A

2. What will be the output?

```
  def f(lst):
      lst = lst[:]
      lst.append(99)
  a = [1, 2]
  f(a)
  print(a)
```

A) [1, 2, 99]

B) [1, 2]

C) [99]

D) Error

Answer: B

3. What does this expression evaluate to?

```
  print({i: chr(65+i) for i in range(5)} == dict(enumerate("ABCDE", 0)))
```

A) True

B) False

C) SyntaxError

D) KeyError

Answer: A

4. What is printed?

```
class A:
    x = 10
class B(A):
    x = 20
class C(A):
    x = 30
class D(B, C):
    pass
print(D.x)
```

A) 10

B) 20

C) 30

D) Error

Answer: B

5. What is the result of this code?

```
from functools import reduce
nums = [1, 2, 3, 4]
print(reduce(lambda x, y: x * y, nums, 0))
```

A) 24

B) 0

C) 1

D) Error

Answer: B

6. What will this code output?

```
s = "abracadabra"
print(max(s, key=s.count))
```

A) a

B) b

C) r

D) c

Answer: A

7. What is printed?

```
lst = [1, 2, [3, 4]]
copy = lst.copy()
copy[2][0] = 99
print(lst)
```

A) [1, 2, [3, 4]]

B) [1, 2, [99, 4]]

C) [1, 2, 99]

D) Error

Answer: B

8. Which line correctly implements a context manager using a generator?

A) @contextmanager def cm(): yield

B) from contextlib import contextmanager; @contextmanager def cm(): yield

C) def cm(): with yield: pass

D) class cm: def __enter__(self): return self

Answer: B

9. What is the output?

```
def outer(x):
    def inner(y):
        nonlocal x
        x += y
        return x
    return inner
f = outer(5)
print(f(3), f(2))
```

A) 8 10

B) 8 5

C) 5 3

D) Error

Answer: A

10. What does this code return?

```
import itertools
print(list(itertools.takewhile(lambda x: x < 5, range(10))))
```

A) [0, 1, 2, 3, 4]

B) [0, 1, 2, 3, 4, 5]

C) [5, 6, 7, 8, 9]

D) []

Answer: A

11. What is printed?

```
d = {}
d.setdefault(1, []).append(10)
d.setdefault(1, []).append(20)
print(d[1])
```

A) [10]

B) [10, 20]

C) []

D) Error

Answer: B

12. What will be the value of `result`?

```
result = [x*y for x in range(3) for y in range(3) if x != y]
```

A) [0, 0, 1, 2, 0, 2, 3, 6]

B) [0, 1, 2, 0, 2, 3, 0, 3, 6]

C) [1, 2, 0, 2, 3, 0, 3, 6]

D) [0, 1, 2, 3, 4, 5, 6, 7, 8]

Answer: A

13. What is the output?

```
print("".join(sorted("listen", key=lambda c: "eiarou".find(c))))
```

A) listen

B) silent

C) eilnst

D) eilstn

Answer: C

14. What does this code produce?

```
class Counter:
    count = 0
    def __init__(self):
        Counter.count += 1
a = Counter()
b = Counter()
print(Counter.count)
```

A) 0

B) 1

C) 2

D) Error

Answer: C

15. What is printed?

```
x = 256
y = 256
print(x is y)
a = 257
b = 257
print(a is b)
```

A) True True

B) True False

C) False True

D) False False

Answer: B

16. What will this output?

```
def fib(n, memo={}):
    if n in memo: return memo[n]
    if n <= 2: return 1
    memo[n] = fib(n-1, memo) + fib(n-2, memo)
    return memo[n]
print(fib(10))
```

A) 55

B) 89

C) 34

D) RecursionError

Answer: A

17. What is the result?

```
print({1, 2, 3} | {3, 4} & {4, 5} ^ {5, 6})
```

A) {1, 2, 3, 4, 5, 6}

B) {1, 2, 4}

C) {1, 2, 6}

D) {4, 6}

Answer: C

18. What does this code print?

```
lst = [1, 2, 3, 4]
it = iter(lst)
print(next(it))
```

```
lst.append(5)
print(list(it))
```

A) 1 [2, 3, 4]

B) 1 [2, 3, 4, 5]

C) 1 [5]

D) RuntimeError

Answer: A

19. What is printed?

```
s = "Python"
print(s[::2] + s[1::2])
```

A) Ptoyn

B) Pytohn

C) Python

D) yhnPto

Answer: C

20. Which is the correct way to create a read-only property?

A) @property def x(self): return self._x

B) @property; def x(self): return self._x; @x.setter def x(self, v): pass

C) @property; def x(self): return self._x; @x.deleter def x(self): pass

D) Both A and B (but B prevents setting)

Answer: A

21. What is the output?

```
from collections import defaultdict
d = defaultdict(list)
d[1].append(10)
print(d[2])
```

A) []

B) None

C) KeyError

D) [10]

Answer: A

22. What will this code return?

```
def f(x): return x * x
g = lambda x: f(x) + 1
print(g(3))
```

A) 9

B) 10

C) 7

D) Error

Answer: B

23. What is printed?

```
class A:
    def __init__(self): self.x = 1
class B(A):
    def __init__(self): super().__init__(); self.x = 2
print(B().x)
```

A) 1

B) 2

C) Error

D) None

Answer: B

24. What does this expression give?

```
print((lambda x: x**2)(5) + (lambda x,y: x+y)(3,4))
```

A) 32

B) 25

C) 29

D) 38

Answer: A

25. What is the output?

```
lst = []
for i in range(3):
    lst.append(lambda: i)
print([f() for f in lst])
```

A) [0, 1, 2]

B) [2, 2, 2]

C) [3, 3, 3]

D) Error

Answer: B

26. What will be printed?

```
import sys
print(sys.getrecursionlimit())
```

A) 1000

B) 500

C) 2000

D) Platform dependent (commonly 1000)

Answer: D

27. What is the result?

```
print("mississippi".replace("iss", "x", 2))
```

A) mxsissippi

B) mxsxppi

C) mxssippi

D) missxppi

Answer: B

28. What does this code output?

```
d = {1: 'one', 2: 'two'}
print(d.popitem())
print(d)
```

A) (2, 'two') {1: 'one'}

B) (1, 'one') {2: 'two'}

C) Random pair

D) Error

Answer: C

29. What is printed?

```
def gen():
    yield from range(3)
    yield 99
print(list(gen()))
```

A) [0, 1, 2, 99]

B) [99, 0, 1, 2]

C) [0, 1, 2]

D) Error

Answer: A

30. What will this output?

```
x = 10
def outer():
    x = 20
    def inner():
        global x
        x = 30
    inner()
    print(x)
outer()
```

```
print(x)
```

A) 20 30

B) 30 30

C) 20 10

D) 30 10

Answer: A

31. What is the output?

```
print(format(1234567.89012, ",.2f"))
```

A) 1,234,567.89

B) 1234567.89

C) 1.23,456,7.89

D) Error

Answer: A

32. What does this code produce?

```
from typing import List
def f(lst: List[int]) -> int:
    return sum(lst)
print(f([1, "2"]))
```

A) 3

B) TypeError

C) 1

D) "12"

Answer: B

33. What is printed?

```
class Meta(type):
    def __new__(cls, name, bases, dct):
        dct['added'] = 42
        return super().__new__(cls, name, bases, dct)
```

```
class MyClass(metaclass=Meta):
    pass
print(MyClass.added)
```

A) 42

B) AttributeError

C) None

D) Error

Answer: A

34. What will be the output?

```
a = [1, 2, 3]
b = a[:]
a is b, a == b
```

A) False True

B) True True

C) False False

D) True False

Answer: A

35. What is the result?

```
print("".join(chr(ord(c) + 1) for c in "HAL"))
```

A) IBM

B) IBN

C) GAM

D) HBM

Answer: A

36. What does this code output?

```
from heapq import heappush, heappop
h = []
heappush(h, (3, "c"))
```

```
heappush(h, (1, "a"))
heappush(h, (2, "b"))
print(heappop(h)[1])
```

A) a

B) b

C) c

D) Error

Answer: A

37. What is printed?

```
x = {1, 2}
y = {2, 3}
x.difference_update(y)
print(x)
```

A) {1}

B) {1, 2}

C) {3}

D) {}

Answer: A

38. What will this return?

```
def decorator(f):
    def wrapper(*args, **kwargs):
        return f(*args, **kwargs) + 1
    return wrapper
@decorator
def add(a, b): return a + b
print(add(5, 3))
```

A) 8

B) 9

C) 12

D) Error

Answer: B

39. What is the output?

```
print((1, 2, 3) < (1, 2, 4))
```

A) True

B) False

C) Error

D) 1

Answer: A

40. What does this code produce?

```
class A:
    __slots__ = ['x']
a = A()
a.x = 10
print(a.x)
a.y = 20
```

A) 10 AttributeError

B) 10 20

C) Error on a.y

D) 10 None

Answer: A

41. What is printed?

```
s = slice(1, 6, 2)
print("abcdefgh"[s])
```

A) bdf

B) aceg

C) bce

D) bdfg

Answer: A

42. What will be the output?

```
from collections import deque
d = deque([1, 2, 3], maxlen=3)
d.append(4)
print(list(d))
```

A) [1, 2, 3]

B) [2, 3, 4]

C) [1, 2, 3, 4]

D) [4]

Answer: B

43. What is the result?

```
print(" ".join(str(i**2) for i in range(5) if i%2))
```

A) 1 9 25

B) 0 4 16

C) 1 4 9 16 25

D) 4 16

Answer: A

44. What does this code output?

```
try:
    raise Exception("msg")
except Exception as e:
    print(type(e).__name__, e)
```

A) Exception msg

B) Exception Exception: msg

C) msg

D) Error

Answer: A

45. What is printed?

```
class Point:
    def __init__(self, x, y): self.x, self.y = x, y
    def __eq__(self, other): return self.x == other.x and self.y == other.y
p1 = Point(1, 2)
p2 = Point(1, 2)
print(p1 == p2, p1 is p2)
```

A) True False

B) False False

C) True True

D) False True

Answer: A

46. What will this output?

```
def f(n):
    return n if n < 2 else f(n-1) + f(n-2)
print(f(7))
```

A) 13

B) 21

C) 8

D) RuntimeError (recursion depth)

Answer: A

47. What is the output?

```
d = dict(a=1, b=2)
print({**d, 'c': 3, 'a': 10})
```

A) {'a': 10, 'b': 2, 'c': 3}

B) {'a': 1, 'b': 2, 'c': 3}

C) Error

D) {'a': 10, 'b': 2}

Answer: A

48. What does this code print?

```
import asyncio
async def main():
    print("start")
    await asyncio.sleep(0)
    print("end")
asyncio.run(main())
```

A) start end

B) end start

C) start

D) Error (no event loop)

Answer: A

49. What is the result?

```
print(bin(42)[2:].zfill(8))
```

A) 00101010

B) 101010

C) 0010101

D) 42

Answer: A

50. What will be printed?

```
class C:
    def __getattr__(self, name):
        return 42
c = C()
print(c.x, c.__dict__)
```

A) 42 {}

B) AttributeError {}

C) 42 {'x': 42}

D) 42 None

Answer: A

=== TOPIC: C Programming, LEVEL: easy ===

1. What is the correct syntax to print "Hello World" in C?

A) printf("Hello World");

B) print("Hello World");

C) echo("Hello World");

D) display("Hello World");

Answer: A

2. Which of these is a valid variable name in C?

A) 1number

B) my number

C) totalCount

D) int

Answer: C

3. What is the output of this code?

```
printf("%d", 5 + 3 * 2);
```

A) 16

B) 11

C) 13

D) 10

Answer: B

4. Which keyword is used to declare a variable in C?

A) var

B) let

C) int (or other data type)

D) define

Answer: C

5. What will be printed?

```
int x = 10;
printf("%d", x);
```

A) x

B) 10

C) %d

D) Error

Answer: B

6. Which symbol is used for single-line comments in C?

A) //

B) #

C) /* */

D) --

Answer: A

7. What is the size of 'int' in most modern C compilers (32-bit or 64-bit systems)?

A) 2 bytes

B) 4 bytes

C) 8 bytes

D) 1 byte

Answer: B

8. What will this code output?

```
printf("%d", 10 / 3);
```

A) 3.333

B) 3

C) 4

D) Error

Answer: B

9. Which format specifier is used for float in printf?

A) %d

B) %f

C) %s

D) %c

Answer: B

10. What is printed by this code?

```
char ch = 'A';
printf("%c", ch);
```

A) 65

B) A

C) a

D) Error

Answer: B

11. Which operator is used for modulus (remainder)?

A) /

B) %

C) //

D) **

Answer: B

12. What is the output?

```
int a = 5;
a = a + 3;
printf("%d", a);
```

A) 5

B) 8

C) 53

D) Error

Answer: B

13. Which of these is NOT a basic data type in C?

A) int

B) float

C) string

D) char

Answer: C

14. What does this code do?

```
int x = 7;
if (x > 5)
    printf("Big");
```

A) Prints Big

B) Prints nothing

C) Error

D) Prints 7

Answer: A

15. What will be printed?

```
printf("%d", 10 % 4);
```

A) 2

B) 2.5

C) 0

D) 4

Answer: A

16. Which symbol ends every C statement?

A) ,

B) ;

C) :

D) .

Answer: B

17. What is the correct way to take integer input?

A) scanf("%d", &x);

B) input("%d", x);

C) read(x);

D) get(x);

Answer: A

18. What is printed?

```
printf("Hello\nWorld");
```

A) HelloWorld

B) Hello World

C) Hello

World

D) Error

Answer: C

19. Which operator is used to compare two values for equality?

A) =

B) ==

C) ===

D) equals

Answer: B

20. What is the output?

```
int x = 0;
printf("%d", !x);
```

A) 0

B) 1

C) Error

D) -1

Answer: B

21. What will this code print?

```
for (int i = 0; i < 3; i++)
    printf("%d ", i);
```

A) 0 1 2

B) 1 2 3

C) 0 1 2 3

D) Infinite loop

Answer: A

22. Which keyword is used to exit a loop immediately?

A) stop

B) break

C) exit

D) return

Answer: B

23. What is printed?

```
int a = 5, b = 3;
printf("%d", a > b ? a : b);
```

A) 5

B) 3

C) 8

D) Error

Answer: A

24. What does this code output?

```
char str[] = "Hello";
printf("%s", str);
```

A) Hello

B) H

C) str

D) Error

Answer: A

25. Which function is used to find the length of a string?

A) length()

B) strlen()

C) size()

D) count()

Answer: B

26. What is the output?

```
int x = 10;
x++;
printf("%d", x);
```

A) 10

B) 11

C) 9

D) Error

Answer: B

27. What will this print?

```
int i = 1;
while (i <= 3) {
```

```
    printf("%d ", i);
    i++;
  }
```

A) 1 2 3

B) 1 2 3 4

C) 0 1 2

D) Infinite loop

Answer: A

28. Which header file is needed for printf and scanf?

A) <math.h>

B) <stdio.h>

C) <string.h>

D) <stdlib.h>

Answer: B

29. What is printed?

```
  printf("%d", 5 == 5);
```

A) 5

B) True

C) 1

D) 0

Answer: C

30. What does this code do?

```
  int arr[3] = {10, 20, 30};
  printf("%d", arr[1]);
```

A) 10

B) 20

C) 30

D) Error

Answer: B

31. Which operator has higher precedence: * or + ?

A) +

B) *

C) Same

D) Depends on values

Answer: B

32. What will be printed?

```
char c = '5';
printf("%d", c);
```

A) 5

B) 53

C) '5'

D) Error

Answer: B

33. What is the correct syntax for if-else?

A) if () {} else {}

B) if {} else {}

C) if () then else

D) if condition {} else {}

Answer: A

34. What does scanf("%d", &x) do?

A) Prints x

B) Reads integer into x

C) Reads string into x

D) Error

Answer: B

35. What is printed?

```
printf("Value: %d", 7 > 4);
```

A) Value: 7

B) Value: 1

C) Value: True

D) Value: 0

Answer: B

36. Which loop is best when the number of iterations is known?

A) while

B) do-while

C) for

D) repeat

Answer: C

37. What is the output?

```
int x = 8;
if (x % 2 == 0)
    printf("Even");
else
    printf("Odd");
```

A) Even

B) Odd

C) Error

D) Nothing

Answer: A

38. What does ++x mean?

A) Use x then increment

B) Increment x then use

C) Decrement x

D) Error

Answer: B

39. Which function adds a character to a string?

A) strcat()

B) strcpy()

C) strlen()

D) None of these

Answer: None directly (but strcat for concatenation)

(Note: Easy level – correct is none of these for single char append, but commonly people use strcat with "\0")

A) strcat()

B) strcpy()

C) strlen()

D) None of these

Answer: D

40. What is printed?

```
printf("%c", 'A' + 2);
```

A) A

B) B

C) C

D) 67

Answer: C

41. What is the default value of an uninitialized local variable in C?

A) 0

B) Garbage value

C) NULL

D) Error

Answer: B

42. Which is correct to declare an array of 5 integers?

A) int arr(5);

B) int arr[5];

C) array int[5];

D) int[5] arr;

Answer: B

43. What will this code print?

```
int x = 10;
printf("%d %d", x, x++);
```

A) 10 10

B) 11 10

C) 10 11

D) Undefined behavior

Answer: D

44. Which keyword skips the current iteration in a loop?

A) break

B) continue

C) return

D) exit

Answer: B

45. What is printed?

```
int a = 4;
printf("%d", a << 1);
```

A) 4

B) 8

C) 2

D) 16

Answer: B

46. What does this code output?

```
printf("Hello" " World");
```

A) Hello World

B) HelloWorld

C) Error

D) Hello " World"

Answer: A

47. Which is used to include header files?

A) import

B) #include

C) using

D) require

Answer: B

48. What is the output?

```
int x = 5;
printf("%d", ++x + x++);
```

A) 11

B) 12

C) 10

D) Undefined behavior

Answer: D

49. Which function is used to compare two strings?

A) strcmp()

B) compare()

C) equals()

D) strcomp()

Answer: A

50. What will be printed?

```
int i;
for (i = 0; i < 5; i++);
printf("%d", i);
```

A) 0

B) 4

C) 5

D) Error

Answer: C

=== TOPIC: C Programming, LEVEL: medium ===

1. What is the output of this code?

```
int x = 10;
printf("%d", x++ + ++x);
```

A) 20

B) 21

C) 22

D) Undefined behavior

Answer: D

2. Which of these is a correct way to declare a pointer to an integer?

A) int *p;

B) int p*;

C) *int p;

D) pointer int p;

Answer: A

3. What will be printed?

```
char str[] = "Hello";
printf("%d", strlen(str));
```

A) 5

B) 6

C) 4

D) Error

Answer: A

4. What does this code do?

```
int a = 5;
int *p = &a;
*p = 10;
printf("%d", a);
```

A) 5

B) 10

C) Address of a

D) Error

Answer: B

5. What is the output?

```
int arr[5] = {1,2,3};
printf("%d", arr[4]);
```

A) 0

B) 3

C) Garbage value

D) Error

Answer: A

6. Which function is used to allocate memory dynamically?

A) malloc()

B) alloc()

C) new()

D) create()

Answer: A

7. What will this code print?

```
  int x = 5;
  switch(x) {
     case 5: printf("Five");
     case 6: printf("Six"); break;
  }
```

A) Five

B) FiveSix

C) Six

D) Nothing

Answer: B

8. What is printed?

```
  char *str = "Hello";
  str[0] = 'J';
  printf("%s", str);
```

A) Jello

B) Hello

C) Segmentation fault / undefined

D) J

Answer: C

9. Which is the correct way to declare a 2D array of 3×4 integers?

A) int arr[3][4];

B) int arr(3,4);

C) int[3][4] arr;

D) array int arr[3,4];

Answer: A

10. What does this code output?

```
int a = 10, b = 20;
printf("%d", a > b ? a : b);
```

A) 10

B) 20

C) Error

D) 30

Answer: B

11. What will be the value of x after execution?

```
int x = 8;
x = x << 2;
printf("%d", x);
```

A) 16

B) 32

C) 4

D) 2

Answer: B

12. Which header file is required for dynamic memory functions like malloc?

A) <stdio.h>

B) <stdlib.h>

C) <string.h>

D) <math.h>

Answer: B

13. What is printed?

```
int i;
```

```
for(i=0; i<5; i++)
    printf("%d", i);
printf("\n%d", i);
```

A) 01234 5

B) 012345

C) 01234

D) Infinite loop

Answer: A

14. What does this code produce?

```
char s[10];
strcpy(s, "Hello");
printf("%s", s);
```

A) Hello

B) H

C) Garbage

D) Error

Answer: A

15. Which statement is used to skip the rest of the current loop iteration?

A) break

B) continue

C) return

D) exit

Answer: B

16. What is the output?

```
printf("%d", sizeof(int*));
```

A) 2

B) 4 or 8 (depends on system)

C) 1

D) Error

Answer: B

17. What will this print?

```
int x = 5;
int *p = &x;
printf("%d %d", *p, p);
```

A) 5 address

B) address 5

C) 5 5

D) Error

Answer: A

18. What is the correct way to free dynamically allocated memory?

A) free(ptr);

B) delete ptr;

C) remove(ptr);

D) destroy(ptr);

Answer: A

19. What does this code output?

```
int arr[] = {10,20,30,40};
printf("%d", *(arr+2));
```

A) 10

B) 20

C) 30

D) 40

Answer: C

20. Which is true about do-while loop?

A) Executes at least once

B) Never executes if condition false

C) Same as while loop

D) Executes only once

Answer: A

21. What is printed?

```
char ch = 65;
printf("%c %d", ch, ch);
```

A) A 65

B) 65 A

C) A A

D) Error

Answer: A

22. What will happen in this code?

```
int *p;
*p = 10;
```

A) Stores 10 safely

B) Undefined behavior / crash

C) Prints 10

D) p becomes 10

Answer: B

23. Which function concatenates two strings?

A) strcat()

B) strcpy()

C) strcmp()

D) strlen()

Answer: A

24. What is the output?

```
#define PI 3.14
printf("%f", PI);
```

A) 3.14

B) 3

C) PI

D) Error

Answer: A

25. What does this code do?

```
int x = 10;
const int *p = &x;
// *p = 20;  // invalid
x = 20;
printf("%d", *p);
```

A) 10

B) 20

C) Error

D) Garbage

Answer: B

26. What will be printed?

```
int a[3][2] = {{1,2},{3,4},{5,6}};
printf("%d", a[1][1]);
```

A) 1

B) 2

C) 4

D) 6

Answer: C

27. Which is correct to pass array to function?

A) void fun(int arr[])

B) void fun(int arr)

C) void fun(int *arr)

D) Both A and C

Answer: D

28. What is the output?

```
printf("%d", 'A' - 'a');
```

A) 0

B) -32

C) 32

D) Error

Answer: B

29. What does this code print?

```
int x = 5;
printf("%d %d %d", x++, x++, x++);
```

A) 5 6 7

B) 7 6 5

C) Undefined behavior

D) 5 5 5

Answer: C

30. Which keyword makes a variable retain value between function calls?

A) static

B) extern

C) register

D) volatile

Answer: A

31. What will this output?

```
enum day {MON, TUE=5, WED};
```

```
printf("%d", WED);
```

A) 2

B) 6

C) 5

D) Error

Answer: B

32. What is printed?

```
char *p = "hello";
printf("%c", *(p+1));
```

A) h

B) e

C) l

D) o

Answer: B

33. Which function is used to allocate memory and initialize to zero?

A) malloc()

B) calloc()

C) realloc()

D) free()

Answer: B

34. What does this code produce?

```
int x = 10;
int y = x > 5 ? 20 : 30;
printf("%d", y);
```

A) 10

B) 20

C) 30

D) Error

Answer: B

35. What is the output?

```
printf("%d", 10 + 'A');
```

A) 75

B) 65

C) 10

D) Error

Answer: A

36. Which is correct for structure declaration?

A) struct student { int roll; char name[20]; };

B) structure student {int roll; char name;};

C) struct {int roll; char name;} student;

D) Both A and C

Answer: A

37. What will happen here?

```
int arr[5];
printf("%d", arr[10]);
```

A) 0

B) Garbage value

C) 10

D) Segmentation fault (undefined)

Answer: D

38. What does strcmp() return when strings are equal?

A) 0

B) 1

C) -1

D) Positive number

Answer: A

39. What is printed?

```
#include <stdio.h>
int main() {
    int x = 5;
    { int x = 10; printf("%d ", x); }
    printf("%d", x);
}
```

A) 10 5

B) 5 10

C) 10 10

D) 5 5

Answer: A

40. Which modifier is used for fastest access variables?

A) auto

B) register

C) static

D) extern

Answer: B

41. What is the output?

```
int x = 4;
printf("%d", x += x++);
```

A) 8

B) 9

C) 4

D) Undefined behavior

Answer: D

42. What does this code do?

```
FILE *fp = fopen("test.txt", "w");
fprintf(fp, "Hello");
fclose(fp);
```

A) Reads Hello

B) Writes Hello to file

C) Appends Hello

D) Error

Answer: B

43. Which is correct to declare function pointer?

A) int (*fp)(int, int);

B) int *fp(int, int);

C) (*int) fp(int, int);

D) int fp*(int, int);

Answer: A

44. What will be printed?

```
printf("%d", 1 && 0 || 1);
```

A) 0

B) 1

C) Error

D) -1

Answer: B

45. What is the size of union when members are int and char?

A) Size of int

B) Size of char

C) Sum of both

D) 0

Answer: A

46. What does this code output?

```
int a = 7;
int *p = &a;
int **pp = &p;
printf("%d", **pp);
```

A) 7

B) Address of a

C) Address of p

D) Error

Answer: A

47. Which function searches for substring?

A) strstr()

B) strchr()

C) strcmp()

D) strcpy()

Answer: A

48. What is printed?

```
int x = 10;
printf("%d %d", ++x, x++);
```

A) 11 11

B) 11 10

C) 10 11

D) Undefined behavior

Answer: D

49. What does extern keyword do?

A) Declares variable without definition

B) Makes variable static

C) Allocates memory

D) Defines constant

Answer: A

50. What will this code print?

```
#define SQUARE(x) x*x
printf("%d", SQUARE(3+2));
```

A) 25

B) 13

C) 9

D) Error

Answer: B

=== TOPIC: C Programming, LEVEL: hard ===

1. What is the output?

```
int x = 5;
printf("%d", x = x++ + ++x);
```

A) 11

B) 12

C) Undefined behavior

D) 10

Answer: C

2. What happens in this code?

```
char *p = "hello";
p[0] = 'H';
```

A) Changes to Hello

B) Segmentation fault

C) Prints Hello

D) Undefined behavior

Answer: B

3. What is printed?

```
union test {
    int a;
    char b;
} u;
u.a = 65;
printf("%c", u.b);
```

A) A

B) 65

C) Garbage

D) Error

Answer: A

4. What will this code output?

```
int arr[] = {10,20,30};
int *p = arr;
printf("%d", *(p++));
printf(" %d", *p);
```

A) 10 20

B) 20 10

C) 10 10

D) Error

Answer: A

5. What is the behavior of this code?

```
int *p = NULL;
*p = 10;
```

A) Stores 10

B) Null pointer dereference → crash

C) Prints 10

D) p becomes 10

Answer: B

6. What does this print?

```
#define MAX 5
int main() {
    int MAX = 10;
    printf("%d", MAX);
}
```

A) 5

B) 10

C) Error

D) Garbage

Answer: B

7. What is the output?

```
struct { int x; char y; } s = {10, 'A'};
printf("%d %c", s.x, s.y);
```

A) 10 A

B) A 10

C) 10 65

D) Error

Answer: A

8. What happens here?

```
int a = 10;
int *const p = &a;
// p = NULL;  // invalid
*p = 20;
printf("%d", a);
```

A) 10

B) 20

C) Error

D) Garbage

Answer: B

9. What is printed?

```
int x = 1;
switch(x++) {
    case 1: printf("One ");
    case 2: printf("Two ");
    default: printf("Default ");
}
```

A) One

B) One Two Default

C) Two Default

D) Default

Answer: B

10. What is the result?

```
char str[10] = "hello";
printf("%d", sizeof(str));
```

A) 5

B) 6

C) 10

D) Error

Answer: C

11. What does this code produce?

```
int (*fp)(int);
int square(int x) { return x*x; }
```

```
fp = square;
printf("%d", fp(5));
```

A) 5

B) 25

C) Address

D) Error

Answer: B

12. What will happen?

```
int arr[2][3] = {{1,2,3},{4,5,6}};
printf("%d", *(*(arr+1)+1));
```

A) 1

B) 4

C) 5

D) 6

Answer: C

13. Which is correct about volatile keyword?

A) Prevents compiler optimization

B) Makes variable static

C) Allocates in register

D) Makes variable constant

Answer: A

14. What is printed?

```
printf("%d", 1 ? 2 ? 3 : 4 : 5);
```

A) 3

B) 4

C) 5

D) Error

Answer: A

15. What is the output?

```
int x = 10;
int *p = &x + 1;
printf("%d", *p);
```

A) 10

B) Garbage / undefined

C) 11

D) Address

Answer: B

16. What does this code do?

```
FILE *fp = fopen("data.txt", "r+");
fseek(fp, 0, SEEK_END);
fprintf(fp, "end");
```

A) Appends "end"

B) Overwrites file

C) Reads from end

D) Error if file doesn't exist

Answer: A

17. What is printed?

```
struct test {
    char c;
    int i;
} t;
printf("%zu", sizeof(t));
```

A) 5

B) 8

C) 9 or more (due to padding)

D) 1

Answer: C

18. What will this output?

```
int a = 5, b = 10;
int *p = &a, *q = &b;
*p = *q;
printf("%d %d", a, b);
```

A) 5 10

B) 10 10

C) 10 5

D) Error

Answer: B

19. What is the behavior?

```
char *str = malloc(10);
strcpy(str, "hello world");
```

A) Safe copy

B) Buffer overflow → undefined

C) Copies "hello"

D) Error

Answer: B

20. What does this print?

```
#define fun(x,y) x*y
printf("%d", fun(2+3,4+1));
```

A) 20

B) 25

C) 14

D) Error

Answer: C

21. What is printed?

```
int x = 8;
printf("%d", x & (x-1));
```

A) 0

B) 8

C) 7

D) 16

Answer: A

22. What happens in this code?

```
const int x = 10;
int *p = (int*)&x;
*p = 20;
printf("%d", x);
```

A) 10

B) 20

C) Undefined behavior

D) Error at compile

Answer: C

23. What is the output?

```
int arr[5];
memset(arr, 0, sizeof(arr));
printf("%d", arr[2]);
```

A) Garbage

B) 0

C) 5

D) Error

Answer: B

24. Which is correct about function pointer syntax?

A) int (*func)(int);

B) int *func(int);

C) (*int) func(int);

D) int func*(int);

Answer: A

25. What will be printed?

```
enum color {RED=5, GREEN, BLUE};
printf("%d", BLUE);
```

A) 5

B) 6

C) 7

D) Error

Answer: C

26. What does this code output?

```
int x = 10;
int y = x > 5 ? x++ : ++x;
printf("%d %d", x, y);
```

A) 11 10

B) 11 11

C) 10 10

D) Undefined

Answer: A

27. What is printed?

```
char str[] = {'h','e','l','l','o','\0'};
printf("%s", str);
```

A) hello

B) hello\0

C) Garbage

D) Error

Answer: A

28. What happens here?

```
int a[10];
int *p = a + 5;
printf("%ld", p - a);
```

A) 5

B) 0

C) Address difference

D) Error

Answer: A

29. Which function reallocates memory?

A) malloc()

B) calloc()

C) realloc()

D) free()

Answer: C

30. What is the output?

```
#pragma pack(1)
struct { char c; int i; } s;
printf("%zu", sizeof(s));
```

A) 8

B) 5

C) 4

D) 1

Answer: B

31. What does this code produce?

```
void *vp;
int x = 10;
vp = &x;
printf("%d", *(int*)vp);
```

A) 10

B) Address

C) Error

D) Garbage

Answer: A

32. What will happen?

```
char *p = "test";
while(*p++) printf("%c", *p);
```

A) test

B) est

C) tset

D) Nothing (undefined after \0)

Answer: B

33. What is printed?

```
int x = 0xA;
printf("%d", x << 1);
```

A) 10

B) 20

C) 5

D) 0x14

Answer: B

34. What is the behavior of this code?

```
int main() {
    int x;
```

```
    printf("%d", x);
  }
```

A) 0

B) Garbage value

C) Error

D) 0 always

Answer: B

35. Which is true about bit fields in structure?

A) Can save memory

B) Must be int type

C) Can be float

D) Always 32-bit

Answer: A

36. What does this print?

```
  printf("%d", 'A' > 'a');
```

A) 1

B) 0

C) -32

D) Error

Answer: B

37. What is the output?

```
  int (*ptr)[3];
  int arr[2][3];
  ptr = arr;
  printf("%d", ptr[1][1]);
```

A) Garbage

B) Second row second element

C) Error

D) Address

Answer: B

38. What happens in this code?

```
static int count;
printf("%d", count++);
printf(" %d", count);
```

A) 0 1

B) 1 1

C) 0 0

D) Error

Answer: A

39. What is printed?

```
int x = 7;
x ^= x;
printf("%d", x);
```

A) 7

B) 0

C) 14

D) Error

Answer: B

40. What does this code do?

```
int x = 5;
int *p = &x;
(*p)++;
printf("%d", x);
```

A) 5

B) 6

C) Error

D) Garbage

Answer: B

41. What is the result?

```
char s[20];
sprintf(s, "%d %s", 42, "answer");
printf("%s", s);
```

A) 42 answer

B) %d %s

C) Garbage

D) Error

Answer: A

42. What will be printed?

```
struct node { int data; struct node *next; };
printf("%zu", sizeof(struct node));
```

A) 4 or 8 + pointer size

B) 4

C) 8

D) 1

Answer: A

43. What happens here?

```
int a = 10, b = 20;
a, b = 30, 40;
printf("%d %d", a, b);
```

A) 10 40

B) 30 40

C) Error

D) 10 20

Answer: A

44. Which is correct about dangling pointer?

A) Points to freed memory

B) Points to NULL

C) Points to valid memory

D) Always safe

Answer: A

45. What is printed?

```
printf("%d", 5 > 3 > 1);
```

A) 1

B) 0

C) Error

D) True

Answer: B

46. What does this code output?

```
int x = 10;
int *p = &x;
p++;
printf("%d", *p);
```

A) 10

B) Garbage / undefined

C) 11

D) Address

Answer: B

47. What is the output?

```
#define ADD(x,y) x+y
printf("%d", 5 * ADD(2,3));
```

A) 25

B) 10

C) 13

D) Error

Answer: B

48. What happens in this code?

```
char *str = NULL;
strcpy(str, "test");
```

A) Works fine

B) Segmentation fault

C) Copies to NULL

D) str becomes "test"

Answer: B

49. Which is correct about recursion in C?

A) Uses stack memory

B) Always better than loops

C) No limit on depth

D) Uses heap memory

Answer: A

50. What is printed?

```
int x = 0;
printf("%d %d", x = 5, x == 5);
```

A) 5 1

B) 5 0

C) 0 1

D) Undefined

Answer: A

=== TOPIC: Java Programming, LEVEL: easy ===

1. What is the correct way to print "Hello World" in Java?

A) System.out.print("Hello World");

B) print("Hello World");

C) console.log("Hello World");

D) echo("Hello World");

Answer: A

2. Which keyword is used to define the main method in Java?

A) function

B) static

C) public static void main

D) entry

Answer: C

3. What is the default value of a local int variable in Java?

A) 0

B) null

C) undefined

D) Garbage value

Answer: C

4. Which of these is a valid identifier in Java?

A) 1number

B) my-number

C) totalCount

D) class

Answer: C

5. What will be printed by this code?

```
System.out.println(10 + 5 * 2);
```

A) 30

B) 20

C) 15

D) 25

Answer: B

6. Which data type is used to store a single character in Java?

A) char

B) String

C) character

D) letter

Answer: A

7. What is the output?

```
boolean flag = true;
System.out.println(!flag);
```

A) true

B) false

C) 1

D) Error

Answer: B

8. Which operator is used for equality comparison in Java?

A) =

B) ==

C) ===

D) equals

Answer: B

9. What does this code print?

```
String s = "Java";
System.out.println(s.length());
```

A) 4

B) 5

C) Java

D) Error

Answer: A

10. Which keyword is used to create a class in Java?

A) class

B) struct

C) object

D) define

Answer: A

11. What is printed?

```
int x = 7;
System.out.println(x > 5 ? "Big" : "Small");
```

A) Big

B) Small

C) 7

D) Error

Answer: A

12. Which loop executes at least once even if condition is false?

A) for

B) while

C) do-while

D) repeat

Answer: C

13. What is the output?

```
for(int i=0; i<3; i++)
    System.out.print(i + " ");
```

A) 0 1 2

B) 1 2 3

C) 0 1 2 3

D) Infinite loop

Answer: A

14. Which method is used to compare two strings for content equality?

A) ==

B) equals()

C) compare()

D) same()

Answer: B

15. What will this print?

```
int[] arr = {10, 20, 30};
System.out.println(arr[1]);
```

A) 10

B) 20

C) 30

D) Error

Answer: B

16. Which keyword is used to inherit a class in Java?

A) inherits

B) extends

C) implements

D) super

Answer: B

17. What is printed?

```
String s = "hello";
System.out.println(s.toUpperCase());
```

A) hello

B) HELLO

C) Hello

D) Error

Answer: B

18. Which access modifier makes a member visible only within the same class?

A) public

B) protected

C) private

D) default

Answer: C

19. What does this code output?

```
int x = 10;
x++;
System.out.println(x);
```

A) 10

B) 11

C) 9

D) Error

Answer: B

20. Which keyword is used to define constants in Java?

A) final

B) const

C) static final

D) Both A and C

Answer: D

21. What is the output?

```
System.out.println(15 / 4);
```

A) 3.75

B) 3

C) 4

D) Error

Answer: B

22. Which collection is ordered and allows duplicates?

A) Set

B) List

C) Map

D) Queue

Answer: B

23. What will this print?

```
if(5 > 3)
    System.out.println("Yes");
else
    System.out.println("No");
```

A) Yes

B) No

C) Error

D) Nothing

Answer: A

24. Which method converts string to integer?

A) Integer.parseInt()

B) String.toInt()

C) parseInteger()

D) convertInt()

Answer: A

25. What is printed?

```
boolean b = 10 > 20;
System.out.println(b);
```

A) true

B) false

C) 10

D) Error

Answer: B

26. Which keyword skips the current iteration in a loop?

A) break

B) continue

C) return

D) exit

Answer: B

27. What does this code do?

```
String s1 = "Java";
String s2 = new String("Java");
System.out.println(s1 == s2);
```

A) true

B) false

C) Error

D) Compilation error

Answer: B

28. Which wrapper class is used for int?

A) Int

B) Integer

C) intWrapper

D) Number

Answer: B

29. What is the output?

```
System.out.println("Hello" + " " + "World");
```

A) HelloWorld

B) Hello World

C) Hello+World

D) Error

Answer: B

30. Which statement is used to handle exceptions?

A) try-catch

B) if-else

C) switch

D) for

Answer: A

31. What will be printed?

```
char ch = 'A';
System.out.println((int)ch);
```

A) A

B) 65

C) 97

D) Error

Answer: B

32. Which keyword creates an object?

A) new

B) create

C) object

D) instance

Answer: A

33. What is printed?

```
int x = 5;
System.out.println(x == 5.0);
```

A) true

B) false

C) Error

D) 1

Answer: A

34. Which loop is used when condition is checked at the end?

A) while

B) for

C) do-while

D) foreach

Answer: C

35. What does this code output?

```
System.out.println(Math.max(10, 20));
```

A) 10

B) 20

C) 30

D) Error

Answer: B

36. Which is the correct way to declare an array?

A) int arr[5];

B) int[] arr = new int[5];

C) array int arr = 5;

D) int arr() = 5;

Answer: B

37. What is printed?

```
String s = null;
System.out.println(s.length());
```

A) 0

B) null

C) NullPointerException

D) Error at compile

Answer: C

38. Which keyword is used for method overriding?

A) override

B) @Override (annotation)

C) super

D) final

Answer: B

39. What will this print?

```
int x = 8;
System.out.println(x % 3);
```

A) 2

B) 0

C) 3

D) 1

Answer: A

40. Which package contains Scanner class?

A) java.util

B) java.io

C) java.lang

D) java.math

Answer: A

41. What is the output?

```
System.out.println(2 + 3 + "7");
```

A) 57

B) 12

C) 27

D) Error

Answer: A

42. Which keyword prevents method overriding?

A) static

B) final

C) private

D) abstract

Answer: B

43. What does this code print?

```
int x = 10;
if(x++ > 10) System.out.println("A");
else System.out.println("B");
```

A) A

B) B

C) Error

D) Nothing

Answer: B

44. Which interface is used for sorting collections?

A) Comparable

B) Comparator

C) Both A and B

D) Sortable

Answer: C

45. What is printed?

```
System.out.println("Java".substring(1,3));
```

A) Ja

B) av

C) Java

D) va

Answer: B

46. Which is the entry point of a Java program?

A) start()

B) run()

C) main()

D) init()

Answer: C

47. What will this output?

```
boolean b = false;
System.out.println(b ? "Yes" : "No");
```

A) Yes

B) No

C) true

D) false

Answer: B

48. Which keyword is used to refer to the current object?

A) this

B) super

C) self

D) me

Answer: A

49. What is the output?

```
System.out.println(5 != 5);
```

A) true

B) false

C) 0

D) 1

Answer: B

50. Which method is called when an object is created?

A) start()

B) run()

C) constructor

D) main()

Answer: C

=== TOPIC: Java Programming, LEVEL: medium ===

1. What is the output?

```
String s1 = "hello";
String s2 = new String("hello");
System.out.println(s1.equals(s2) && s1 == s2);
```

A) true true

B) true false

C) false true

D) false false

Answer: B

2. What will this code print?

```
List<Integer> list = new ArrayList<>();
list.add(10); list.add(20);
System.out.println(list.get(1));
```

A) 10

B) 20

C) null

D) Error

Answer: B

3. What is printed?

```
int x = 5;
System.out.println(++x + x++);
```

A) 11

B) 12

C) 10

D) Undefined behavior

Answer: B

4. Which statement is correct about abstract class?

A) Cannot be instantiated

B) Can have constructor

C) All methods must be abstract

D) Both A and B

Answer: D

5. What does this code output?

```
StringBuilder sb = new StringBuilder("Java");
sb.append(" is fun");
System.out.println(sb);
```

A) Java

B) Java is fun

C) is fun

D) Error

Answer: B

6. What is the result?

```
int[] arr = {1,2,3};
for(int i : arr) System.out.print(i);
```

A) 123

B) 1 2 3

C) Error

D) 0

Answer: A

7. Which exception is thrown when dividing by zero?

A) NullPointerException

B) ArithmeticException

C) ArrayIndexOutOfBoundsException

D) ClassCastException

Answer: B

8. What will this print?

```
try {
    int x = 10/0;
} catch(ArithmeticException e) {
    System.out.print("A");
```

```
  } finally {
      System.out.print("F");
  }
```

A) AF

B) A

C) F

D) Error

Answer: A

9. What is printed?

```
  class Test { static int x = 10; }
  System.out.println(Test.x);
```

A) 0

B) 10

C) Error

D) null

Answer: B

10. Which is correct way to create thread?

A) Extend Thread class

B) Implement Runnable

C) Both A and B

D) Use start() directly

Answer: C

11. What does this code output?

```
  String s = "racecar";
  System.out.println(s.equals(new StringBuilder(s).reverse().toString()));
```

A) true

B) false

C) racecar

D) Error

Answer: A

12. What is the output?

```
Integer a = 100;
Integer b = 100;
System.out.println(a == b);
```

A) true

B) false

C) Error

D) null

Answer: A

13. Which collection does NOT allow duplicates?

A) ArrayList

B) LinkedList

C) HashSet

D) Vector

Answer: C

14. What will be printed?

```
System.out.println("Hello".substring(1));
```

A) Hello

B) ello

C) H

D) Error

Answer: B

15. What is the result of this code?

```
int x = 10;
x += ++x + x++;
```

System.out.println(x);

A) 32

B) 31

C) 30

D) Undefined

Answer: D

16. Which keyword is used in interface for default method?

A) default

B) static

C) final

D) abstract

Answer: A

17. What does this print?

Map<String, Integer> map = new HashMap<>();

map.put("A", 1); map.put("B", 2);

System.out.println(map.get("B"));

A) 1

B) 2

C) null

D) Error

Answer: B

18. What is printed?

String s = "Java";

s = s.concat(" Code");

System.out.println(s);

A) Java

B) Java Code

C) Code

D) Error

Answer: B

19. Which is correct about final variable?

A) Value can be changed

B) Value cannot be changed after initialization

C) Can be null

D) Must be initialized at declaration

Answer: B

20. What is the output?

```
class Parent { void show() { System.out.print("P"); } }
class Child extends Parent { void show() { System.out.print("C"); } }
Parent p = new Child(); p.show();
```

A) P

B) C

C) Error

D) PC

Answer: B

21. What does this code produce?

```
int[] arr = new int[5];
System.out.println(arr.length);
```

A) 0

B) 5

C) null

D) Error

Answer: B

22. Which method must be overridden in Runnable?

A) start()

B) run()

C) execute()

D) main()

Answer: B

23. What is printed?

```
System.out.println(1 + 2 + "3" + 4 + 5);
```

A) 12345

B) 615

C) 15

D) 345

Answer: B

24. Which exception is unchecked?

A) IOException

B) SQLException

C) NullPointerException

D) FileNotFoundException

Answer: C

25. What will this output?

```
String str = "abc";
str = str.toUpperCase();
System.out.println(str);
```

A) abc

B) ABC

C) Abc

D) Error

Answer: B

26. Which is correct about static method?

A) Can access instance variables directly

B) Belongs to class, not object

C) Can be overridden

D) Requires object to call

Answer: B

27. What is printed?

```
for(int i=0; i<5; i++) {
    if(i==3) continue;
    System.out.print(i);
}
```

A) 01234

B) 0124

C) 012345

D) Infinite loop

Answer: B

28. Which interface is used by lambda expressions?

A) FunctionalInterface

B) Runnable

C) Comparator

D) All of the above

Answer: D

29. What does this code return?

```
Optional<String> opt = Optional.ofNullable(null);
System.out.println(opt.orElse("Default"));
```

A) null

B) Default

C) Optional.empty

D) Error

Answer: B

30. What is the output?

```
int x = 0;
while(x++ < 3) System.out.print(x);
```

A) 012

B) 123

C) 0123

D) 0

Answer: B

31. Which is correct syntax for lambda?

A) () -> System.out.println("Hi")

B) x -> x*2

C) (int x) -> { return x*2; }

D) All of the above

Answer: D

32. What will be printed?

```
String s = "banana";
System.out.println(s.indexOf("na", 3));
```

A) 2

B) 4

C) -1

D) 3

Answer: B

33. What is the result?

```
class A { int x = 5; }
A a1 = new A(); A a2 = a1;
a2.x = 10;
```

System.out.println(a1.x);

A) 5

B) 10

C) Error

D) 0

Answer: B

34. Which method removes element from ArrayList?

A) remove()

B) delete()

C) pop()

D) clear()

Answer: A

35. What does this print?

System.out.println(" ".join(List.of("a","b","c")));

A) abc

B) a b c

C) Error (no join method on String)

D) a,b,c

Answer: C

36. What is printed?

int x = 100;

Integer y = x;

x = 200;

System.out.println(y);

A) 100

B) 200

C) null

D) Error

Answer: A

37. Which is correct about interface?

A) Can have instance variables

B) All methods are abstract by default (before Java 8)

C) Can be instantiated

D) Can have constructors

Answer: B

38. What will this output?

```
String s = "Java";
s.replace('a', 'x');
System.out.println(s);
```

A) Jxvx

B) Java

C) Jxva

D) Error

Answer: B

39. What is the output?

```
try { throw new Exception(); }
catch(Exception e) { System.out.print("Caught"); }
```

A) Caught

B) Exception

C) Nothing

D) Error

Answer: A

40. Which keyword prevents class inheritance?

A) final

B) static

C) abstract

D) sealed

Answer: A

41. What does this code print?

```
List<String> list = Arrays.asList("a","b","c");
System.out.println(list);
```

A) [a, b, c]

B) a b c

C) abc

D) Error

Answer: A

42. What is printed?

```
int x = 5;
System.out.println(x > 3 && x < 10);
```

A) true

B) false

C) 5

D) Error

Answer: A

43. Which is used to sort a List?

A) Collections.sort()

B) list.sort()

C) Arrays.sort()

D) Both A and B

Answer: D

44. What will be the output?

```
String s = null;
```

```
try { s.length(); } catch(NullPointerException e) { System.out.print("Null"); }
```

A) Null

B) 0

C) Error

D) Nothing

Answer: A

45. What is printed?

```
for(int i=1; i<=5; i+=2) System.out.print(i);
```

A) 12345

B) 135

C) 246

D) 15

Answer: B

46. Which annotation is used for overriding?

A) @Override

B) @Deprecated

C) @SuppressWarnings

D) @FunctionalInterface

Answer: A

47. What does this code output?

```
int[] arr = {5,4,3,2,1};
Arrays.sort(arr);
System.out.println(arr[0]);
```

A) 5

B) 1

C) 0

D) Error

Answer: B

48. Which is correct about enum?

A) Can have methods

B) Can implement interfaces

C) Both A and B

D) Cannot have constructor

Answer: C

49. What is the output?

```
System.out.println(10 == 10.0);
```

A) true

B) false

C) Error

D) 1

Answer: A

50. Which class is the superclass of all classes?

A) Object

B) Class

C) Super

D) Base

Answer: A

=== TOPIC: Java Programming, LEVEL: hard ===

1. What is printed?

```
Integer a = 1000;
Integer b = 1000;
System.out.println(a == b);
```

A) true

B) false

C) Error

D) null

Answer: B

2. What will this code output?

```
String s = "Java";
s.intern();
String t = new String("Java");
System.out.println(s == t.intern());
```

A) true

B) false

C) Error

D) Compilation error

Answer: A

3. What is the result?

```
class Test {
    static { System.out.print("S"); }
    { System.out.print("I"); }
    Test() { System.out.print("C"); }
}
new Test();
```

A) SIC

B) SCI

C) ISC

D) CIS

Answer: A

4. What does this print?

```
List<String> list = new ArrayList<>();
list.add("A"); list.add("B");
```

```
Iterator<String> it = list.iterator();
while(it.hasNext()) {
    System.out.print(it.next());
    it.remove();
}
```

A) AB

B) A

C) ConcurrentModificationException

D) Empty

Answer: A

5. What is printed?

```
int x = 0;
System.out.println(x > 0 ? x++ : ++x);
```

A) 0

B) 1

C) -1

D) Undefined

Answer: B

6. Which is true about garbage collection?

A) Can be forced with System.gc()

B) Guarantees object destruction

C) Runs in background

D) Both A and C

Answer: C

7. What will this output?

```
String str = "abc";
str = str + str.intern();
System.out.println(str == "abcabc");
```

A) true

B) false

C) Error

D) Compilation error

Answer: B

8. What is the behavior?

```
class A {
    A() throws Exception { throw new Exception(); }
}
class B extends A { }
```

A) Compiles fine

B) Compilation error

C) Runtime exception

D) No exception

Answer: B

9. What is printed?

```
try {
    throw new RuntimeException();
} finally {
    System.out.print("F");
}
```

A) F

B) RuntimeException

C) Nothing

D) Error

Answer: A

10. What does this code produce?

```
Stream<Integer> stream = Stream.of(1,2,3,4);
```

System.out.println(stream.filter(x -> x%2==0).count());

A) 2

B) 4

C) 1

D) Error

Answer: A

11. What is the output?

class Parent { protected int x = 10; }

class Child extends Parent { void show() { System.out.println(x); } }

new Child().show();

A) 10

B) Error

C) 0

D) null

Answer: A

12. What will happen?

List<String> list = Arrays.asList("a","b");

list.add("c");

A) Adds c

B) UnsupportedOperationException

C) Compiles but runtime error

D) Works fine

Answer: B

13. What is printed?

int x = 5;

System.out.println(x = x == 5 ? 10 : 20);

A) 5

B) 10

C) 20

D) Error

Answer: B

14. Which is correct about record (Java 14+)?

A) Immutable data class

B) Auto-generates equals, hashCode, toString

C) Can have methods

D) All of the above

Answer: D

15. What is the result?

```
Optional<String> opt = Optional.empty();
System.out.println(opt.orElseThrow(() -> new RuntimeException()));
```

A) null

B) RuntimeException

C) Empty

D) Error

Answer: B

16. What does this print?

```
String s1 = new String("test").intern();
String s2 = "test";
System.out.println(s1 == s2);
```

A) true

B) false

C) Error

D) Compilation error

Answer: A

17. What is printed?

```
class Test {
    static int x;
    static { x = 10; }
    static { x = 20; }
}
System.out.println(Test.x);
```

A) 10

B) 20

C) 0

D) Error

Answer: B

18. What will this output?

```
Predicate<Integer> p = x -> x > 5;
System.out.println(p.test(7));
```

A) true

B) false

C) 7

D) Error

Answer: A

19. What is the behavior?

```
Thread t = new Thread(() -> { throw new RuntimeException(); });
t.start();
```

A) Program crashes

B) Exception ignored

C) Thread dies silently

D) Compilation error

Answer: C

20. What is printed?

```
System.out.println("a" + new Integer(10) + 20);
```

A) a1020

B) a30

C) Error

D) a1020

Answer: A

21. Which is correct about volatile keyword?

A) Ensures visibility across threads

B) Prevents caching

C) Both A and B

D) Makes variable immutable

Answer: C

22. What does this code produce?

```
CompletableFuture.supplyAsync(() -> 42)
    .thenApply(x -> x * 2)
    .thenAccept(System.out::println);
```

A) 84

B) 42

C) Error

D) Nothing (async)

Answer: D (prints 84 asynchronously)

23. What is the output?

```
class A { int x = 5; }
A a = new A();
a.x = 10;
System.out.println(new A().x);
```

A) 5

B) 10

C) Error

D) 0

Answer: A

24. What will happen?

```
String s = "hello";
s = s.substring(0, 10);
```

A) hello

B) StringIndexOutOfBoundsException

C) Empty string

D) Error at compile

Answer: B

25. What is printed?

```
int x = 0;
for( ; x < 5; x += 2) ;
System.out.println(x);
```

A) 0

B) 4

C) 6

D) 5

Answer: C

26. Which is true about synchronized method?

A) Locks on object instance

B) Locks on class for static

C) Both A and B

D) Prevents all access

Answer: C

27. What does this code output?

```
int[] arr = {1,2,3};
IntStream.of(arr).map(x -> x*2).forEach(System.out::print);
```

A) 246

B) 123

C) Error

D) 2 4 6

Answer: A

28. What is the result?

```
class Outer {
    private int x = 10;
    class Inner { void show() { System.out.println(x); } }
}
new Outer().new Inner().show();
```

A) 10

B) Error

C) 0

D) null

Answer: A

29. What will be printed?

```
System.out.println((int)(Math.random() * 10));
```

A) Random 0-9

B) Always 0

C) Always 10

D) Error

Answer: A

30. Which annotation forces method implementation in subclasses?

A) @Override

B) @FunctionalInterface

C) @Deprecated

D) None (abstract does)

Answer: None directly, but abstract methods require override

31. What is printed?

```
String s = "test";
System.out.println(s.hashCode() == "test".hashCode());
```

A) true

B) false

C) Error

D) Depends

Answer: A

32. What happens in this code?

```
List<Integer> list = new CopyOnWriteArrayList<>();
for(Integer i : list) list.add(99);
```

A) ConcurrentModificationException

B) Works fine

C) Infinite loop

D) Error

Answer: B

33. What is the output?

```
enum Day { MON(1), TUE(2); int val; Day(int v){val=v;} }
System.out.println(Day.MON.val);
```

A) 1

B) MON

C) Error

D) null

Answer: A

34. What does this print?

```
BiFunction<Integer, Integer, Integer> f = (a,b) -> a + b;
System.out.println(f.apply(5,3));
```

A) 8

B) 5

C) 3

D) Error

Answer: A

35. What is printed?

```
class Test {
    Test() { this(5); System.out.print("A"); }
    Test(int x) { System.out.print("B"); }
}
new Test();
```

A) BA

B) AB

C) A

D) B

Answer: A

36. Which is correct about sealed classes (Java 17)?

A) Restrict which classes can extend

B) Use permits keyword

C) Both A and B

D) Cannot be final

Answer: C

37. What will this output?

```
String s = new String("hello").intern();
System.out.println(s == "hello");
```

A) true

B) false

C) Error

D) Depends on JVM

Answer: A

38. What is the behavior?

```
Thread t1 = new Thread(() -> {});
t1.start(); t1.start();
```

A) Runs twice

B) IllegalThreadStateException

C) Nothing

D) Error at compile

Answer: B

39. What does this print?

```
System.out.println("a" == new String("a").intern());
```

A) true

B) false

C) Error

D) Compilation error

Answer: A

40. Which is true about weak reference?

A) Can be garbage collected anytime

B) Prevents GC

C) Stronger than soft reference

D) Same as phantom

Answer: A

41. What is printed?

```
int x = 0b1010;
System.out.println(x);
```

A) 1010

B) 10

C) 0

D) Error

Answer: B

42. What will happen?

```
class A { final void show() {} }
class B extends A { void show() {} }
```

A) Compiles

B) Compilation error

C) Runtime error

D) Overrides successfully

Answer: B

43. What is the output?

```
Supplier<String> sup = () -> "Hi";
System.out.println(sup.get());
```

A) Hi

B) Supplier

C) Error

D) null

Answer: A

44. What does this code produce?

```
var list = List.of(1,2,3);
list = list.stream().map(x -> x*2).toList();
System.out.println(list);
```

A) [2, 4, 6]

B) [1,2,3]

C) Error

D) Compilation error (var + reassignment)

Answer: A

45. What is printed?

```
System.out.println(1 + 2 * 3 + "4" + 5 * 6);
```

A) 742

B) 1420

C) 36

D) 7420

Answer: A

46. Which is correct about module-info.java?

A) Used in Java 9+ modules

B) Defines exports/requires

C) Both A and B

D) Optional for all projects

Answer: C

47. What will be the result?

```
String s = "abc";
s += s = "def";
System.out.println(s);
```

A) abcdef

B) defdef

C) abc

D) Error

Answer: B

48. What does this print?

```
class Test {
    static int x = 5;
    static { x = x-- - --x; }
}
System.out.println(Test.x);
```

A) 5

B) 7

C) 3

D) Undefined

Answer: D

49. Which is true about phantom reference?

A) Cleared before GC

B) get() always returns null

C) Used for cleanup actions

D) All of the above

Answer: D

50. What is the output?

```
System.out.println(new Object() { public String toString() { return "Test"; } });
```

A) Test

B) Object@...

C) Error

D) null

Answer: A