

ME010203 Numerical Analysis with Python3

MCQ for private students

1. Who developed Python Programming Language?
 - (a) Rasmus Lerdorf
 - (b) Niene Stom
 - (c) Wick van Rossum
 - (d) Guido van Rossum
2. Which of the following is the correct extension of the Python file?
 - (a) .python
 - (b) .py
 - (c) .p
 - (d) .pl
3. Which of the following is an invalid variable?
 - (a) -
 - (b) my_1st_string
 - (c) 1st_string
 - (d) can
4. Which of the following is used to define a block of code in Python language?
 - (a) Key
 - (b) Brackets
 - (c) Indentation
 - (d) All of the mentioned
5. Which of the following character is used to give single-line comments in Python?
 - (a) %
 - (b) #
 - (c) !
 - (d) //
6. What is the order of precedence in python?
 - (a) Exponential, Parentheses, Multiplication, Division, Addition, Subtraction
 - (b) Exponential, Parentheses, Division, Multiplication, Addition, Subtraction
 - (c) Parentheses, Exponential, Multiplication, Division, Subtraction, Addition
 - (d) Parentheses, Exponential, Multiplication, Division, Addition, Subtraction

7. What are the values of the following Python expressions?

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

- (a) 512, 64, 512
- (b) 512, 64, 64
- (c) 64, 512, 64
- (d) 64, 64, 64

8. What will be the output of the following code ?

`print(2**4 + (5 + 3)**(1 + 1))`

- (a) 72
- (b) 80
- (c) 25
- (d) 32

9. Which of the following functions is a built-in function in python?

- (a) `Limit()`
- (b) `plot()`
- (c) `print()`
- (d) `pprint()`

10. What arithmetic operator is used with strings in Python?

- (a) /
- (b) -
- (c) +
- (d) %

11. Which of the following is a Python tuple?

- (a) (8, 9, 10)
- (b) [9, 10, 11]
- (c) [9, 10, 11)
- (d) {4, 5, 7}

12. Let `s = (0, 5, 8, 7)`, which of the following is incorrect?

- (a) `print(max(s))`
- (b) `print(len(s))`
- (c) `s[1] = 4`

(d) `print(s[0])`

13. Which keyword is used for function?

- (a) Fun
- (b) Def
- (c) Define
- (d) Function

14. What will be the value of x in the following Python expression?

```
x = int(65.89+3/3)
```

- (a) 67
- (b) 22
- (c) 66
- (d) 23

15. What data type is use to store values in terms of key and value?

- (a) List
- (b) Dictionary
- (c) Class
- (d) Tuple

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

```
a=100  
b=10  
b=a+b  
print(b)
```

- (a) 10
- (b) 100
- (c) 110
- (d) None of these.

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

```
myscore = 1000  
message = 'I scored %s points'  
print(message % myscore)
```

- (a) I scored 1000 points
- (b) I scored 100 points
- (c) I scored 1000 point
- (d) I score 1000 points

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

```
joketext = '%s: a device for finding furniture in the dark'  
bodypart1 = 'Knee'  
bodypart2 = 'Shin'  
print(joketext % bodypart2)
```

- (a) Shin: a device for finding furniture in the dark
- (b) Knee: a device for finding furniture in the dark
- (c) s: a device for finding furniture in the dark
- (d) None of these

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

```
Vegetable_list = ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']  
print(Vegetable_list[2])
```

- (a) Potato
- (b) Beans
- (c) Garlic
- (d) Onion

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

```
Vegetable_list = ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']  
Vegetable_list[3] = 'Pumpkin'  
print(Vegetable_list)
```

- (a) ['Tomato', 'Potato', 'Onion', 'Pumpkin', 'Beans', 'Ladies finger', 'Cucumber']
- (b) ['Tomato', 'Potato', 'Pumpkin', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']
- (c) ['Tomato', 'Potato', 'Onion', 'Garlic', 'Pumpkin', 'Ladies finger', 'Cucumber']
- (d) ['Pumpkin', 'Pumpkin', 'Pumpkin', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']

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

```
Vegetable_list = ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']  
print(Vegetable_list[2 : 5])
```

- (a) ['Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger']
- (b) ['Onion', 'Garlic', 'Beans']
- (c) ['Potato', 'Onion', 'Garlic', 'Beans']
- (d) ['Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']

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

```
Vegetable_list = ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']  
Vegetable_list.append('Banana')  
print(Vegetable_list)
```

- (a) ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Banana']
- (b) ['Banana', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']
- (c) ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber', 'Banana']
- (d) ['Banana', 'Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']

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

```
Vegetable_list = ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']  
del Vegetable_list[5]  
print(Vegetable_list)
```

- (a) ['Tomato', 'Potato', 'Onion', 'Garlic', 'Ladies finger', 'Cucumber']
- (b) ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans']
- (c) ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger']
- (d) ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Cucumber']

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

```
age = 10  
if age == 11:  
    print('Red')  
else:  
    print('Green')
```

- (a) Red
- (b) Green
- (c) IndentationError
- (d) None of these

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

```
age = 10  
if age == 11:  
    print('Red')  
else:  
    print('Green')
```

- (a) Red
- (b) Green
- (c) IndentationError
- (d) None of these

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

```
age = 10
if age < 10:
    print('Red')
if age > 10:
    print('Green')
else:
    print('Blue')
```

- (a) Red
- (b) Blue
- (c) Green
- (d) IndentationError

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

```
print(list(range(10, 20)))
```

- (a) [10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]
- (b) [11, 12, 13, 14, 15, 16, 17, 18, 19, 20]
- (c) [10, 11, 12, 13, 14, 15, 16, 17, 18, 19]
- (d) [11, 12, 13, 14, 15, 16, 17, 18, 19]

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

```
x = 45
y = 80
while x < 47 and y < 83:
    x = x + 1
    y = y + 1
print(x, y)
```

- (a) 47 83
- (b) 48 83
- (c) 47 82
- (d) 48 82

29. What are the parts of a Function in Python?

- (a) Name & parameters
- (b) Name, parameters & body
- (c) Name & body
- (d) None of these

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

```
def savings(pocketmoney, earnedmoney, spending):
    return pocketmoney + earnedmoney - spending
print(savings(500, 800, 400))
```

- (a) 1300
- (b) 400
- (c) 900
- (d) 800

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

```
def sillyagejoke(age):  
    if age >= 10 and age <= 13:  
        print('Green')  
    else:  
        print('Blue')  
sillyagejoke(9)
```

- (a) Green
- (b) Blue
- (c) Red
- (d) IndentationError

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

```
print(abs(-10))
```

- (a) -11
- (b) -10
- (c) 11
- (d) 10

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

```
print(int(123.456))
```

- (a) 456
- (b) 123
- (c) 123456
- (d) 123.45

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

```
print(len('this is a test string'))
```

- (a) 17
- (b) 21
- (c) 23
- (d) 19

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

```
Vegetable_list = ['Tomato', 'Potato', 'Onion', 'Garlic', 'Beans', 'Ladies finger', 'Cucumber']  
del Vegetable_list[0]  
print(len(Vegetable_list))
```

- (a) 6
- (b) 7
- (c) 5
- (d) None of these

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

```
numbers = [5, 4, 8, 16, 12]  
print(max(numbers))
```

- (a) 4
- (b) 5
- (c) 16
- (d) 3

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

```
for x in range(0, 3):  
    print(x)
```

- (a) 0
1
2
3
- (b) 1
2
3
- (c) 1
2
- (d) 0
1
2

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

```
for x in range(10, 16, 2):  
    print(x)
```

- (a) 10
11
12
13
14
15

- (b) 10
- 12
- 14
- 16
- (c) 10
- 12
- 14
- (d) 12
- 14

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

```
L = list(range(40, 30, -2))  
print(L)
```

- (a) [40, 38, 36, 34, 32, 30]
- (b) [40, 38, 36, 34, 32]
- (c) [38, 36, 34, 32]
- (d) [38, 36, 34, 32, 30]

40. What is the output of the following?

```
15//4
```

- (a) 3
- (b) 3.75
- (c) 11
- (d) 4

41. What is the output of the following?

```
2**10
```

- (a) 100
- (b) 20
- (c) 1024
- (d) None of these

42. What is the output of the following?

```
10%6
```

- (a) 60
- (b) 3
- (c) 6
- (d) None of these

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

```
z = complex(2, 3)
print(z.conjugate())
```

- (a) 2+3j
- (b) (2, 3)
- (c) 2-3j
- (d) (2, -3)

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

```
z=4+3j
a=(z.real ** 2 + z.imag ** 2) ** 0.5
print(a)
```

- (a) 5
- (b) 4-3j
- (c) -5
- (d) None of these

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

```
z = complex(6, 8)
print(abs(z))
```

- (a) 6
- (b) 8
- (c) 10
- (d) 9

46. Which of the following is the correct code to create three symbols x, y and z at a time?

- (a) from sympy import symbols
x,y,z = symbols('x,y,z')
- (b) from sympy import Symbols
x,y,z = symbols('x,y,z')
- (c) from sympy import symbols
x,y,z = Symbols('x,y,z')
- (d) from sympy import symbols
x,y,z = symbols('x,y & z')

47. Which of the following is the correct code to factor the expression $x^2 - y^2$?

- (a) from sympy import factor, Symbol
x = Symbol('x')
y = Symbol('y')
expr = x*2 - y*2
factor(expr)

- (b) from sympy import factor, Symbol
`x = symbols('x')`
`y = symbols('y')`
`expr = x**2 - y**2`
`factor(expr)`
- (c) from sympy import factors, Symbol
`x = Symbol('x')`
`y = Symbol('y')`
`expr = x**2 - y**2`
`factors(expr)`
- (d) from sympy import factor, Symbol
`x = Symbol('x')`
`y = Symbol('y')`
`expr = x**2 - y**2`
`factor(expr)`

48. Which of the following is the correct code to expand the expression $(x + y)(x - y)$?

- (a) from sympy import expand, Symbol
`x = Symbol('x')`
`y = Symbol('y')`
`expr = (x+y)(x-y)`
`expand(expr)`
- (b) from sympy import expand, Symbol
`x = Symbol('x')`
`y = Symbol('y')`
`expr = (x+y)*(x-y)`
`expand(expr)`
- (c) from sympy import expands, Symbol
`x = Symbol('x')`
`y = Symbol('y')`
`expr = (x+y)*(x-y)`
`expands(expr)`
- (d) from sympy import expand, symbol
`x = symbol('x')`
`y = symbol('y')`
`expr = (x+y)*(x-y)`
`expand(expr)`

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

```
from sympy import pprint, symbols
x,y = symbols('x, y')
pprint(x**2+2*x*y+y**2)
```

- (a) $x^2 + 2xy + y^2$
- (b) $(x+y)**2$

- (c) $(x+y)^2$
- (d) $(x+y)*(x+y)$

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

```
from sympy import symbols
x,y = symbols('x, y')
expr=x**2+2*x*y+y**2
print(expr.subs({x:1, y:2}))
```

- (a) $1 + 2y + y^2$
- (b) $x^2 + 2x + 4$
- (c) 9
- (d) None of these

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

```
from sympy import symbols, simplify
x,y = symbols('x, y')
expr=x**2+2*x*y+y**2
expr=expr.subs({x:1-y}))
print(simplify(expr))
```

- (a) $(1-y)^2+2*(1-y)*y+y^2$
- (b) 1
- (c) $(1 - y)^2 + 2(1 - y)y + y^2$
- (d) None of these

52. Which function is used to convert strings to Mathematical expressions?

- (a) symbols
- (b) simplify
- (c) sympify
- (d) Expression

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

```
from sympy import Symbol, solve
x = Symbol('x')
expr = 2*x - 5 - 7
print(solve(expr))
```

- (a) 6
- (b) 12
- (c) [12]
- (d) [6]

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

```
from sympy import Symbol, solve
x = Symbol('x')
expr = x**2+5*x+4
print(solve(expr))
```

- (a) -4, -1
- (b) [-4, -1]
- (c) [4, 1]
- (d) 4, 1

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

```
from sympy import Symbol, solve
x = Symbol('x')
expr = x**2+5*x+4
print(solve(expr, dict=True))
```

- (a) [{x : -4}, {x : -1}]
- (b) [-4, -1]
- (c) -4, -1
- (d) [x : -4, x : -1]

56. Which of the following is the correct code to solve the system of linear equations $2x + 3y = 6$ and $3x + 2y = 12$

- (a) from sympy import symbols, solve
x, y = symbols('x, y')
expr1: 2*x + 3*y = 6
expr2: 3*x + 2*y=12
soln=solve((expr1, expr2), dict=True)
print(soln)
- (b) from sympy import symbols, solve
x, y = symbols('x, y')
expr1 = 2*x + 3*y + 6
expr2 = 3*x + 2*y+12
soln=solve((expr1, expr2), dict=True)
print(soln)
- (c) from sympy import symbols, solve
x, y = symbols('x, y')
expr1 = 2*x + 3*y - 6
expr2 = 3*x + 2*y-12
soln=solve((expr1, expr2), dict=True)
print(soln)
- (d) from sympy import symbols, solve
x, y = symbols('x, y')

```

expr1 = 2*x + 3*y - 6
expr2 = 3*x + 2*y-12
soln=solve((expr), dict=True)
print(soln)

```

57. Which of the following is the correct code to plot the function $y = 2x + 3$?

- (a)

```
from sympy import Symbol, plot
x = Symbol('x')
plot(2*x+3)
```
- (b)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot(y-2*x-3)
```
- (c)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot(2*x+3)
```
- (d)

```
from sympy.plotting import plotting
from sympy import Symbol
x = Symbol('x')
plot(y=2*x+3)
```

58. Which of the following is the correct code to plot the functions $y = 2x + 3$ and $y = 3x + 1$?

- (a)

```
from sympy import Symbol, plot
x = Symbol('x')
plot(2*x+3, 3*x+1)
```
- (b)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot(y-2*x-3, y-3*x-1)
```
- (c)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot(2*x+3, 3*x+1)
```
- (d)

```
from sympy.plotting import plotting
from sympy import Symbol
x = Symbol('x')
plot(y=2*x+3)
```

59. Which of the following is the correct code to plot the function $y = 7x - 5$ in the interval $[-5, 5]$?

- (a)

```
from sympy import plot
from sympy import Symbol
x = Symbol('x')
plot((7*x -5), (x, -5, 5))
```

- (b)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot((7*x - 5), (x, -5, 5))
```
- (c)

```
from sympy.plotting import plotting
from sympy import Symbol
x = Symbol('x')
plot((7*x - 5), (x, -5, 5))
```
- (d)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot((7*x - 5), (-5, 5))
```

60. Which of the following is the correct code to plot the function $y = 7x - 5$ in the interval $[-5, 5]$ with title 'A line'?

- (a)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot((7*x - 5), (x, -5, 5), title='A line')
```
- (b)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot((7*x - 5), (x, -5, 5), 'A line')
```
- (c)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot((7*x - 5), (-5, 5), title='A line')
```
- (d)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
plot((y-7*x + 5), (x, -5, 5), title='A line')
```

61. Which of the following is the correct code to plot the function $y = 2x + 35$ and save the plot to a file line.png in the current directory?

- (a)

```
from sympy.plotting import plot
from sympy import Symbol, Save
x = Symbol('x')
p=plot(2*x+3)
p.save('line.png')
```
- (b)

```
from sympy.plotting import plot
from sympy import Symbol
x = Symbol('x')
p=plot(y=2*x+3)
p.save('line.png')
```

(c) `from sympy.plotting import plot`
`from sympy import Symbol, Save`
`x = Symbol('x')`
`p=plot(2*x+3)`
`p.Save('line.png')`

(d) `from sympy.plotting import plot`
`from sympy import Symbol`
`x = Symbol('x')`
`p=plot(2*x+3)`
`p.save('line.png')`

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

```
from sympy import Symbol
from sympy.plotting import plot
x = Symbol('x')
p = plot(2*x+3, 3*x+1, legend=True, show=False)
p[0].line_color = 'b'
p[1].line_color = 'r'
```

- (a) Graph of the lines $y = 2x + 3$ in red color and $y = 3x + 1$ in blue color.
- (b) Graph of the lines $y = 2x + 3$ in blue color and $y = 3x + 1$ in red color.
- (c) Error
- (d) Nothing as output.

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

```
from sympy import Symbol
from sympy.plotting import plot
x = Symbol('x')
p = plot(5*x+7, 9*x+1, legend=True, show=False)
p[0].line_color = 'b'
p[1].line_color = 'r'
p.show()
```

- (a) Graph of the lines $y = 5x + 7$ in red color and $y = 9x + 1$ in blue color.
- (b) Graph of the lines $y = 5x + 7$ in blue color and $y = 9x + 1$ in red color.
- (c) Error
- (d) Nothing as output.

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

```
n=10
for x in range (1,n):
    if n%x==0:
        print(x)
```

- (a) 3
- 4

- 6
- 7
- 8
- 9
- (b) 1
- 5
- (c) 1
- 2
- 5
- (d) 2
- 3
- 4
- 5

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

```
import math
print(math.cos(math.pi/4))
```

- (a) 1
- (b) 0
- (c) $\frac{1}{\sqrt{2}}$
- (d) $\frac{1}{2}$

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

```
import math
print(math.sin(math.pi/2))
```

- (a) 1
- (b) 0
- (c) $\frac{1}{2}$
- (d) None of these

67. Which of the following is the correct code to find $\lim_{x \rightarrow 1}(x + 1)$?

- (a)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(x+1,1).doit()
print(L)
```
- (b)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(x+1, x, 1)
print(L)
```

- (c)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(x+1, x, 0).doit()
print(L)
```
- (d)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(x+1, x, 1).doit()
print(L)
```

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

```
from sympy import Limit, Symbol, S
x = Symbol('x')
L=Limit(1/x, x, S.Infinity).doit()
print(L)
```

- (a) 1
- (b) 0
- (c) ∞
- (d) None of these

69. Which of the following is the correct code to find $\lim_{x \rightarrow 0^-} \frac{1}{x}$?

- (a)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(1/x, x, 0, dir='-').doit()
print(L)
```
- (b)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(1/x, 0, dir='-').doit()
print(L)
```
- (c)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(1/x, x, 0, dir='-')
```



```
print(L)
```
- (d)

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(1/x, x, 0, dir='+').doit()
print(L)
```

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

```
from sympy import Limit, Symbol
x = Symbol('x')
L=Limit(1/x, x, 0, dir='+').doit()
print(L)
```

- (a) 1
- (b) 0
- (c) ∞
- (d) $-\infty$

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

```
from sympy import Limit, Symbol, S
n = Symbol('n')
L=Limit((1+1/n)**n, n, S.Infinity).doit()
print(L)
```

- (a) 1
- (b) 0
- (c) e
- (d) ∞

72. Which of the following is the correct code to find derivative of $x^3 + x^2 + x$?

(a)

```
from sympy import Derivative, Symbol
x = Symbol('x')
f = x**3 + x**2 + x
D=Derivative(f, x)
print(D)
```

(b)

```
from sympy import derivative, Symbol
x = Symbol('x')
f = x**3 + x**2 + x
D=Derivative(f, x).doit()
print(D)
```

(c)

```
from sympy import derivative, Symbol
x = Symbol('x')
f = x**3 + x**2 + x
D=derivative(f, x).doit()
print(D)
```

(d)

```
from sympy import Derivative, Symbol
x = Symbol('x')
f = x**3 + x**2 + x
D=Derivative(f, x).doit()
print(D)
```

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

```
from sympy import Derivative, Symbol, pprint
x = Symbol('x')
f = x**2+x+1
D=Derivative(f, x).doit()
pprint(D)
```

- (a) $2*x+2$
- (b) $2*x+1$
- (c) $2x+1$
- (d) ImportError

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

```
from sympy import Derivative, symbols, pprint
x,y = symbols('x,y')
f =y*x**2+y*x+y
D=Derivative(f,y).doit()
pprint(D)
```

- (a) $x^2 + x + 1$
- (b) $2xy + y$
- (c) $2xy + x + y$
- (d) ImportError

75. Which of the following is the correct code to find partial derivative of $x^2y^3 + 2x^2y + xy$ with respect to y?

(a) from sympy import derivative, symbols, pprint
 x,y = symbols('x,y')
 f =x**2*y**3+2*x**2*y+x*y
 D=derivative(f,y).doit()
 pprint(D)

(b) from sympy import Derivative, symbols, pprint
 x,y = symbols('x,y')
 f =x**2*y**3+2*x**2*y+x*y
 D=Derivative(f,y)
 pprint(D)

(c) from sympy import Derivative, symbols, pprint
 x,y = symbols('x,y')
 f =x**2*y**3+2*x**2*y+x*y
 D=Derivative(f,y).doit()
 pprint(D)

(d) from sympy import Derivative, symbols, pprint
 x,y = symbols('x,y')
 f =x**2*y**3+2*x**2*y+x*y
 D=Derivative(f,x).doit()
 pprint(D)

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

```
from sympy import Symbol, Derivative, pprint
x = Symbol('x')
f = 5*x**5 + 2*x**3 + 8*x
```

```
d = Derivative(f, x, 2).doit()
pprint(d)
```

- (a) $25x^4 + 6x^2 + 8$
- (b) $300x^2 + 12$
- (c) $100x^3 + 12x$
- (d) None of these

77. Which of the following is the correct code to find third order derivative of $12x^5 + 26x^3 + 19x + 10$?

- (a)

```
from sympy import Derivative, Symbol
x = Symbol('x')
f = 12*x**5 + 26* x**3 + 19*x+10
D=Derivative(f, x, 3).doit()
```
- (b)

```
from sympy import Derivative, Symbol
x = Symbol('x')
f = 12*x**5 + 26* x**3 + 19*x+10
D=Derivative(f, x, 2).doit()
```
- (c)

```
from sympy import Derivative, Symbol
x = Symbol('x')
f = 12*x**5 + 26* x*3 + 19*x+10
D=Derivative(f, x, 3).doit()
```
- (d)

```
from sympy import Derivative, Symbol
x = Symbol('x')
f = 12*x**5 + 26* x**3 + 19*x+10
D=Derivative(f, x, 3)
```

78. Which of the following is the correct code to find critical points of the function $f(x) = x^5 - 30x^3 + 50x$?

- (a)

```
from sympy import Symbol, solve, derivative
x = Symbol('x')
f = x**5 - 30*x**3 + 50*x
d1 = derivative(f, x).doit()
criticalpoints = solve(d1)
print(criticalpoints)
```
- (b)

```
from sympy import Symbol, Derivative
x = Symbol('x')
f = x**5 - 30*x**3 + 50*x
d1 = Derivative(f, x).doit()
print(criticalpoints)
```
- (c)

```
from sympy import Symbol, solve, Derivative
x = Symbol('x')
f = x**5 - 30*x**3 + 50*x
d1 = Derivative(f, x).doit()
criticalpoints = solve(d1)
print(criticalpoints)
```

```
(d) from sympy import Symbol, solve, Derivative
x = Symbol('x')
f = x**5 - 30*x**3 + 50*x
d1 = Derivative(f, x, 2).doit()
criticalpoints = solve(d1)
print(criticalpoints)
```

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

```
from sympy import Symbol, solve, Derivative
x = Symbol('x')
f = x**2 - 4*x
d1 = Derivative(f, x).doit()
print(solve(d1))
```

- (a) [2, 4]
- (b) [2]
- (c) ImportError
- (d) None of these

80. Which of the following is the correct code to find $\int x^3 dx$?

- (a) from sympy import integral, Symbol


```
x = Symbol('x')
I=integral(x**3, x).doit()
print(I)
```
- (b) from sympy import Integral, Symbol


```
x = Symbol('x')
I=Integral(x**3, x).doit()
print(I)
```
- (c) from sympy import Integral, Symbol


```
x = Symbol('x')
I=Integral(x**3, x)
print(I)
```
- (d) from sympy import Integral, Symbol


```
x = Symbol('x')
I=Integral(x*3, x).doit()
print(I)
```

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

```
from sympy import Integral, Symbol, pprint
x = Symbol('x')
I=Integral(2*x+3, x).doit()
pprint(I)
```

- (a) $x^2 + 3x$
- (b) $x ** 2 + 3 * x$

- (c) 2
- (d) ImportError

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

```
from sympy import Integral, Symbol
x = Symbol('x')
I=Integral(2*x+3, (x,0,2)).doit()
print(I)
```

- (a) 4
- (b) 10
- (c) 6
- (d) None of these.

83. Which of the following is the correct code to find $\int_2^5 2x^3 + 5x + 10 dx$?

- (a)

```
from sympy import Integral, Symbol
x = Symbol('x')
I=Integral(2*x**3+5*x+10, x).doit()
print(I)
```
- (b)

```
from sympy import integral, Symbol
x = Symbol('x')
I=integral(2*x**3+5*x+10, (x,2,5)).doit()
print(I)
```
- (c)

```
from sympy import Integral, Symbol
x = Symbol('x')
I=Integral(2*x**3+5*x+10, (x,1,5)).doit()
print(I)
```
- (d)

```
from sympy import Integral, Symbol
x = Symbol('x')
I=Integral(2*x**3+5*x+10, (x,2,5)).doit()
print(I)
```

84. Which of the following is the correct code to find area between the curves $f(x) = x$ and $g(x) = x^2$ between the coordinates $x=0$ and $x=1$?

- (a)

```
from sympy import integral, Symbol
x = Symbol('x')
A=integral(x-x**2, (x,0,1)).doit()
print(A)
```
- (b)

```
from sympy import Derivative, Symbol
x = Symbol('x')
A=Derivative(x-x**2, (x,0,1)).doit()
print(A)
```

- (c) `from sympy import Integral, Symbol`
`x = Symbol('x')`
`A=Integral(x-x**2, (x,0,1)).doit()`
`print(A)`
- (d) `from sympy import Integral, Symbol`
`x = Symbol('x')`
`A=Integral(x+x**2, (x,0,1)).doit()`
`print(A)`

85. Which of the following is the correct code to find length of the curves $f(x) = x^2$ between the coordinates $x=0$ and $x=5$?

- (a) `from sympy import Integral, Symbol, Derivative, sqrt`
`x = Symbol('x')`
`f=x**2`
`D=Derivative(f,x).doit()`
`L=Integral(sqrt(1+D**2), x).doit()`
`print(L)`
- (b) `from sympy import Integral, Symbol, Derivative, sqrt`
`x = Symbol('x')`
`f=x**2`
`D=Derivative(f,x)`
`L=Integral(sqrt(1+D**2), (x,0,5)).doit()`
`print(L)`
- (c) `from sympy import Integral, Symbol, Derivative`
`x = Symbol('x')`
`f=x**2`
`D=Derivative(f,x).doit()`
`L=Integral((1+D**2), (x,0,5)).doit()`
`print(L)`
- (d) `from sympy import Integral, Symbol, Derivative, sqrt`
`x = Symbol('x')`
`f=x**2`
`D=Derivative(f,x).doit()`
`L=Integral(sqrt(1+D**2), (x,0,5)).doit()`
`print(L)`

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

```
from numpy import array
a = array([[0, 0, 0], [0, 0, 0], [0, 0, 0]])
a[1] = [2, 3, 2]
print(a)
```

- (a) `[[0 0 0]`
`[0 0 0]`
`[2 3 2]]`

- (b) $\begin{bmatrix} 0 & 0 & 0 \\ 2 & 3 & 2 \\ 0 & 0 & 0 \end{bmatrix}$
- (c) $\begin{bmatrix} 2 & 3 & 2 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- (d) None of these

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

```
from numpy import array
a = array([[0, 0, 0], [0, 0, 0], [0, 0, 0]])
a[1, 1] = 5
print(a)
```

- (a) $\begin{bmatrix} 5 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- (b) $\begin{bmatrix} 0 & 0 & 0 \\ 5 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- (c) $\begin{bmatrix} 0 & 5 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- (d) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

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

```
from numpy import array
a = array([[0, 0, 0], [0, 0, 0], [0, 0, 0]])
a[2, 0 : 2] = [8, -3]
print(a)
```

- (a) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 8 & -3 & 0 \end{bmatrix}$
- (b) $\begin{bmatrix} 0 & 0 & 0 \\ 8 & -3 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- (c) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 8 & -3 \\ 0 & 0 & 0 \end{bmatrix}$
- (d) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 8 & -3 \end{bmatrix}$

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

```
from numpy import array
a = array([[0, 0, 0, 0], [0, 0, 0, 0], [0, 0, 0, 0], [0, 0, 0, 0]])
a[1] = [1, 2, 3, 4]
a[2, 3] = 5
print(a)
```

(a) $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

(b) $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 5 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

(c) $\begin{bmatrix} 0 & 0 & 0 & 0 \\ 1 & 2 & 3 & 4 \\ 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

(d) None of these

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

```
from numpy import array, dot
x = array([7, 3])
y = array([2, 1])
print dot(x,y)
```

(a) 42

(b) 17

(c) 13

(d) 14

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

```
from numpy import array, dot
x = array([7, 3])
A = array([[1, 2], [3, 2]])
print dot(A,x)
```

(a) [27 13]

(b) [17 23]

(c) [13 27]

(d) None of these

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

```
from numpy import array, dot
```

```
A = array([[1, 2], [3, 2]])
B = array([[1, 1], [2, 2]])
print dot(A,B)
```

- (a) $\begin{bmatrix} 3 & 6 \\ 5 & 10 \end{bmatrix}$
- (b) $\begin{bmatrix} 5 & 5 \\ 7 & 7 \end{bmatrix}$
- (c) $\begin{bmatrix} 6 & 5 \\ 3 & 10 \end{bmatrix}$
- (d) None of these

93. What will be the Lagrange's Interpolation formula corresponding to the following discrete data ?

X	x_0	x_1	x_2
Y	y_0	y_1	y_2

(a)
$$y(x) = \frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)} + \frac{(x-x_0)(x-x_2)}{(x_1-x_0)(x_1-x_2)} + \frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}$$

(b)
$$y(x) = \frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)}y_2 + \frac{(x-x_0)(x-x_2)}{(x_1-x_0)(x_1-x_2)}y_1 + \frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}y_0$$

(c)
$$y(x) = \frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)}y_0 + \frac{(x-x_0)(x-x_2)}{(x_1-x_0)(x_1-x_2)}y_1 + \frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}y_2$$

(d)
$$y(x) = \frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)}y_0 + \frac{(x-x_0)(x-x_2)}{(x_1-x_0)(x_1-x_2)}y_1 + \frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}y_2$$

94. What is ∇y_3 in Newtons divided differences?

- (a) $\frac{y_3-y_1}{x_3-x_1}$
- (b) $\frac{y_3-y_0}{x_3-x_0}$
- (c) $\frac{y_3-y_2}{x_3-x_2}$
- (d) $\frac{x_3-x_0}{y_3-y_0}$

95. Which of the following is the Newton-Raphson formula?

- (a) $x_{n+1} = x_n - \frac{f'(x_n)}{f(x_n)}$
- (b) $x_{n+1} = x_n - \frac{f(x_{n-1})}{f'(x_{n-1})}$
- (c) $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
- (d) None of these

96. What will be the equivalent equations corresponding to the system of equations

$$\begin{aligned} 4x+8y=10 \\ 16x+20y=7 \end{aligned} ?$$

- (a) $2x+4y=5$
 $8x+10y=7$
- (b) $2x+4y=5$
 $12y=33$
- (c) $2x+4y=5$
 $-12y=33$
- (d) $2x+4y=5$
 $12y=-33$

97. What will be the LU decomposition of the matrix $\begin{pmatrix} 2 & 1 \\ 8 & 7 \end{pmatrix}$?

- (a) $L = \begin{pmatrix} 2 & 1 \\ 0 & 3 \end{pmatrix}$ $U = \begin{pmatrix} 1 & 0 \\ 4 & 1 \end{pmatrix}$
- (b) $L = \begin{pmatrix} 1 & 0 \\ 4 & 0 \end{pmatrix}$ $U = \begin{pmatrix} 2 & 1 \\ 0 & 3 \end{pmatrix}$
- (c) $L = \begin{pmatrix} 1 & 0 \\ 4 & 1 \end{pmatrix}$ $U = \begin{pmatrix} 2 & 1 \\ 0 & 1 \end{pmatrix}$
- (d) $L = \begin{pmatrix} 1 & 0 \\ 4 & 1 \end{pmatrix}$ $U = \begin{pmatrix} 2 & 1 \\ 0 & 3 \end{pmatrix}$

98. Which of the following is the trapezoidal rule?

- (a) $\int_a^b f(x)dx = \frac{b-a}{2} [f(a) + f(b)]$
- (b) $\int_a^b f(x)dx = f(b) - f(a)$
- (c) $\int_a^b f(x)dx = \frac{1}{2} [f(b) + f(a)]$
- (d) $\int_a^b f(x)dx = \frac{b-a}{2} [f(b) - f(a)]$

99. Which of the following is the composite trapezoidal rule?

(a) $\int_{x_0}^{x_n} y dx = \frac{h}{2} [y_0 + y_1 + y_2 + \cdots + y_{n-1} + y_n]$

(b) $\int_{x_0}^{x_n} y dx = \frac{h}{2} [y_0 + 2(y_1 + y_2 + \cdots + y_n) + y_{n+1}]$

(c) $\int_{x_0}^{x_n} y dx = h [y_0 + 2(y_1 + y_2 + \cdots + y_{n-1}) + y_n]$

(d) $\int_{x_0}^{x_n} y dx = \frac{h}{2} [y_0 + 2(y_1 + y_2 + \cdots + y_{n-1}) + y_n]$

100. Which of the following is the Simpson's 1/3 Rule?

(a) $\int_{x_0}^{x_2} f(x) = \frac{x_2 - x_0}{3} [f(x_0) + 4f(x_1) + f(x_2)] dx$

(b) $\int_{x_0}^{x_2} f(x) = \frac{x_2 - x_0}{6} [f(x_0) + 4f(x_1) + f(x_2)] dx$

(c) $\int_{x_0}^{x_2} f(x) = \frac{x_2 - x_0}{6} [f(x_0) + 2f(x_1) + f(x_2)] dx$

(d) $\int_{x_0}^{x_2} f(x) = \frac{x_2 + x_0}{6} [f(x_0) + 4f(x_1) + f(x_2)] dx$

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