**Numpy exam**

**Section A: NumPy Creation**

**import numpy as np**

**1. From a Python List**

list1 = [1, 2, 3, 4, 5]

arr1 = np.array(list1)

**2. From a Tuple**

tuple1 = (10, 20, 30, 40)

arr2 = np.array(tuple1)

**3. Using arange**

arr3 = np.arange(0, 31, 5)

**4. Using linspace**

arr4 = np.linspace(0, 50, 6)

**5. Using ones**

arr5 = np.ones((4, 4))

**6. Using zeros**

arr6 = np.zeros((3, 3))

**7. Using empty**

arr7 = np.empty((2, 2))

**8. Using full**

arr8 = np.full((5, 5), 9)

**9. Using eye**

arr9 = np.eye(3)

**10. Using random**

arr10 = np.random.randint(1, 101, (2, 2))

**11. Using astype**

arr11 = np.array([10, 20, 30]).astype(float)

**12. Using reshape**

arr12 = np.arange(9).reshape(3, 3)

**13. Using diag**

arr13 = np.diag([10, 20, 30, 40])

**Section B: Indexing, Slicing, and Fancy Indexing**

**14. Accessing Elements in 1D Array**

val14 = np.array([5, 10, 15, 20, 25])

Print(arr14[2])

**15. Accessing Elements in 2D Array**

val15 = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])

Print (arr15[1, 2])

**16. Negative Indexing in 1D Array**

val16 = np.array([12, 23, 34, 45])

Print(arr16[-1])

**17. Slicing a 1D Array**

arr17 = np.array([10, 20, 30, 40, 50, 60])

Print(arr17[:4])

**18. Slicing a 2D Array**

arr18 = np.array([[10, 20, 30], [40, 50, 60], [70, 80, 90]])

Print(arr18[:2, :2])

**19. Reverse a 1D Array Using Slicing**

arr19 = np.array([1, 2, 3, 4, 5])

Print(arr19[::-1])

**20. Fancy Indexing in 1D Array**

arr20 = np.array([10, 20, 30, 40, 50])

Print(arr20[[0, 2, 3]])

**21. Fancy Indexing in 2D Array**

arr21 = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])

Print(arr21[[0, 1, 2], [1, 2, 0]])

**22. Slice every second element in 1D Array**

arr22 = np.array([1, 2, 3, 4, 5, 6, 7, 8])

Print(arr22[::2])

**23. Slice every second column in a 2D Array**

arr23 = np.array([[10, 20, 30, 40], [50, 60, 70, 80], [90, 100, 110, 120]])

Print(arr23[:, ::2])

**24. Access last row using negative indexing**

arr24 = np.array([[1, 2], [3, 4], [5, 6], [7, 8]])

Print(arr24[-1])

**25. Reverse each row in a 2D Array**

arr25 = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])

Print(arr25[:, ::-1])

**Section C: NumPy Copying**

**26. Shallow Copy Using view()**

arr26 = np.array([1, 2, 3, 4])

view26 = arr26.view()

**27. Shallow Copy Modification**

arr27 = np.array([1, 2, 3, 4])

view27 = arr27.view()

view27[0] = 100

**28. Deep Copy Using copy()**

arr28 = np.array([5, 6, 7, 8])

deep\_copy28 = arr28.copy()

**29. Effect of Modifying Deep Copy**

deep\_copy29 = arr28.copy()

deep\_copy29[0] = 200

**30. Difference Between Shallow and Deep Copy**

- Shallow copy shares data, modifying one affects the other.

- Deep copy creates a new independent copy.