



# UNIT-1 COMPLETE PYQ QUESTION

## LIST

### Topic 1: Bisection Method

November 2023

1. What is the rate of convergence of Bisection Method?
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### Topic 2: Newton-Raphson Method

June 2025

2. Find the real root of

$$x^3 - x - 10 = 0$$

by Newton-Raphson Method correct to 4 decimal places.

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December 2024

3. Using Newton-Raphson Method find the real root of

$$3x = \cos x + 1$$

correct to five decimal places.

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June 2024

4. Considering initial approximation  $x = 2$ , find the next approximation for

$$x^3 - x^2 + 4x - 4 = 0$$

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5. What is the rate of convergence of Newton-Raphson Method?

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### **November 2023**

6. Evaluate  $\sqrt{12}$  correct to four decimal places by Newton-Raphson Method.

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### **June 2023**

7. Find the real root of

$$x^3 - 3x - 5 = 0$$

correct to four decimal places using Newton-Raphson Method.

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### **June 2022**

8. Find the real root of

$$x^4 - x - 10 = 0$$

using Newton-Raphson Method.

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## **Topic 3: Regula-Falsi Method**

### **November 2023**

9. Using Regula-Falsi Method find the real root of

$$x \log_{10} x - 1.2 = 0$$

correct to four decimal places.

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### **June 2023**

10. Find the real root of

$$xe^{x-3}=0$$

correct to three decimal places using Regula-Falsi Method.

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## Topic 4: Finite Differences

**November 2023**

11. Construct a backward difference table for  $y = \log x$

and find

$$\nabla^3 \log 40$$

and

$$\nabla^4 \log 50$$

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**June 2024**

12. Find missing values in the difference table.

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**June 2025**

13. Find  $f(g)$  from a finite difference table.

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**December 2024**

14. Find  $f(g)$  from the given table.

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## Topic 5: Relation Between Operators

**November 2023**

15. Prove

$$\Delta = \frac{1}{2}\delta^2 + \delta\sqrt{1 + \delta^2/4}$$

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16. Prove

$$\Delta + \nabla = \Delta/\nabla - \nabla/\Delta$$

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### June 2024

17. Find

$$\Delta e^{ax}$$

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18. Find

$$\Delta^2 e^{ax}$$

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19. Find

$$\Delta \log x$$

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### June 2022

20. Prove

$$\Delta^n O^{n+1} = n(n+1)/2 \Delta^n O^n$$

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21. Prove

$$\Delta^n \sin(ax+b)$$

identity.

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## Topic 6: Newton Forward Interpolation

## **December 2024**

22. Derive Newton Forward Interpolation Formula and estimate  $f(1.25)$ .

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## **June 2022**

23. Use Newton's Formula for interpolation to find net premium at age 25 from given table.

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## **June 2024**

24. Find missing values using interpolation table.

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# **Topic 7: Newton Backward Interpolation**

## **November 2023**

25. Construct backward difference table and evaluate backward differences.

(Indirect question)

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## **June 2024**

26. Missing value interpolation problems based on backward interpolation.

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# **Topic 8: Newton Divided Difference Formula**

## **June 2025**

27. Find solution using Newton Divided Difference Interpolation Formula.

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## **June 2023**

28. Using Newton Divided Difference Formula find

$f(8)$

and

$f(15)$

from the given table.

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**November 2023**

29. Using Newton Divided Difference Formula calculate value of

$f(6)$

from the given data.

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## **Topic 9: Lagrange Interpolation Formula**

**June 2025**

30. Find solution using Lagrange Interpolation Formula.

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**November 2023**

31. Using Lagrange Method find  $f(x)$  as polynomial in  $x$ .

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**November 2023**

32. Using Lagrange Interpolation Formula fit a polynomial to given data.

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**PYQ FREQUENCY ANALYSIS**

Topic	Frequency
Newton-Raphson	6 Times
Newton Divided Difference	3 Times
Lagrange Formula	3 Times
Newton Forward Interpolation	3 Times
Finite Differences	4 Times
Operator Relations	5 Times
Regula-Falsi	2 Times
Newton Backward	2 Times
Bisection Method	1 Theory Question

## MOST EXPECTED QUESTIONS FOR NEXT EXAM

### ★★★★★ Very High Probability

1. Newton-Raphson Method numerical
2. Newton Divided Difference numerical
3. Lagrange Interpolation numerical
4. Newton Forward Interpolation derivation
5. Relation between operators
6. Finite Difference Table

### ★★★★★ High Probability

7. Regula-Falsi numerical
8. Newton Backward Interpolation
9. Missing value interpolation

### ★★★ Medium Probability

10. Bisection Method derivation

## 11. Rate of convergence questions

If you want, I can also create a "**Unit-1 100% PYQ Solution Booklet**" with complete step-by-step solutions of all 32 questions in RGPV exam format.