🔥 UNIT-4 PYQ QUESTION PAPERS ANALYSIS (Transform Calculus)

⭐⭐⭐⭐⭐ Laplace Transform

1. Define Laplace Transform and find the Laplace Transform of standard functions.
2. Find the Laplace Transform of:
    - tnt^ntn
    - eate^{at}eat
    - sinat\sin atsinat
    - cosat\cos atcosat
3. State the definition of Laplace Transform and discuss its applications.

⭐⭐⭐⭐⭐ Properties of Laplace Transform

4. State and prove the Linearity Property of Laplace Transform.
5. Explain First Shifting Theorem with example.
6. Explain Second Shifting Theorem.
7. State and prove Differentiation Property of Laplace Transform.
8. State Initial Value and Final Value Theorems.
9. Explain various properties of Laplace Transform with examples.

⭐⭐⭐⭐⭐ Inverse Laplace Transform

10. Find the Inverse Laplace Transform using Partial Fraction Method.
11. Find the Inverse Laplace Transform of:

1(s+1)(s+2)\frac{1}{(s+1)(s+2)}(s+1)(s+2)1

12. Find the Inverse Laplace Transform of:

s+2s2+4s+3\frac{s+2}{s^2+4s+3}s2+4s+3s+2

13. Explain different methods of finding Inverse Laplace Transform.

⭐⭐⭐⭐ Periodic Functions

14. Define Periodic Function.
15. Obtain Laplace Transform of a Periodic Function.
16. Find the Laplace Transform of a given periodic waveform.

⭐⭐⭐⭐⭐ Convolution Theorem

17. State and prove Convolution Theorem.
18. Find Inverse Laplace Transform using Convolution Theorem.
19. Explain Convolution Integral.

⭐⭐⭐⭐ Evaluation of Integrals

20. Evaluate:

∫0∞e−atsin(bt) dt\int_0^\infty e^{-at}\sin(bt)\,dt∫0∞e−atsin(bt)dt

using Laplace Transform.

21. Evaluate:

∫0∞e−atcos(bt) dt\int_0^\infty e^{-at}\cos(bt)\,dt∫0∞e−atcos(bt)dt

using Laplace Transform.

22. Explain the method of evaluating integrals by Laplace Transform.

⭐⭐⭐⭐⭐ ODE by Laplace Transform

23. Solve:

dydt+y=0\frac{dy}{dt}+y=0dtdy+y=0

using Laplace Transform.

24. Solve second-order differential equations using Laplace Transform.
25. Solve initial value problems using Laplace Transform.
26. Explain the procedure of solving ODEs by Laplace Transform.
27. Solve:

y′′+y=0y''+y=0y′′+y=0

using Laplace Transform.

🔥 This is one of the most repeated numerical questions.

⭐⭐⭐ Fourier Transform

28. Define Fourier Transform.
29. Explain Fourier Transform and its applications.
30. Differentiate between Laplace Transform and Fourier Transform.
31. State properties of Fourier Transform.

🎯 TOP 10 MOST EXPECTED QUESTIONS FOR RGPV 2026

Long Questions (14 Marks)

1. Solve ODE using Laplace Transform.
2. Find Inverse Laplace Transform using Partial Fraction Method.
3. State and prove Convolution Theorem.
4. Explain Properties of Laplace Transform.
5. Find Laplace Transform of a Periodic Function.

6. Solve second-order differential equation using Laplace Transform.
7. Explain different methods of Inverse Laplace Transform.
8. Evaluate definite integrals using Laplace Transform.
9. Explain Fourier Transform and its applications.
10. State and prove Differentiation Property of Laplace Transform.

🚀 TOP 5 MUST STUDY (One-Night Preparation)

1. **Laplace Transform**
2. **Properties of Laplace Transform**
3. **Inverse Laplace Transform**
4. **ODE using Laplace Transform**
5. **Convolution Theorem**