Structure of Question- Math-3 (Final)

Q.1 **Short questions from full syllabus:** **(10 marks)**

- Separate real and imaginary part of $w = \sqrt{2}z + i - 3$.
- State Laurent series.
- Evaluate followings:
- $\mathcal{L}\{3e^{2t} - 4t + sin3t\}$;
- $\mathcal{L}\{e^{2t} \sin 2t\}$;
- $\mathcal{L}\{t\ cos3t\}$;
- $\mathcal{L}\{2t\ u(t-1)\}$;
- $\mathcal{L}\{5\delta(t-3)\}$;
- $\mathcal{L}\{3e^{2t} - 4t + sin3t\}$;
- $\mathcal{L}^{-1}\{\frac{2}{s+1} - \frac{3}{s^3} + \frac{1}{s^2-4}\}$;
- $\mathcal{L}^{-1}\{\frac{2s}{(s+1)^2+9}\}$.

Q.2. **Broad Questions:** **(10 marks)**

- Mapping for rectangular and triangular region.
- Improper integral using CRT.
- Laurent series.

Q.3. **Broad Questions:** **(10 marks)**

- Laplace Transformation using definition.
- Laplace Transformation using unit step function. Also sketch the function.
- Inverse Laplace Transformation using partial fraction.
- Inverse Laplace Transformation for unit step function. Also sketch the function.

Q.4. **Broad Questions:** **(10 marks)**

- Solving linear IVP using Laplace Transformation.
- Solving system of linear IVP using Laplace Transformation.
- Solving linear IVP related to application of DE using Laplace Transformation