2403000503063001
EXAMINATION NOVEMBER 2024
BACHELOR OF SCIENCE (NEP) (THIRD SEMESTER)
SEC-MATHEMATICAL METHODS - LEVEL 6

[Time: As Per Schedule] **[Max. Marks: 25]**

Instructions:
1. Fill up strictly the following details on your answer book
   a. Name of the Examination : **BACHELOR OF SCIENCE (NEP) (THIRD SEMESTER)**
   b. Name of the Subject : **SEC-MATHEMATICAL METHODS - LEVEL 6**
   c. Subject Code No : **2403000503063001**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

Student's Signature

Q.1 Answer any FIVE from the following questions. **5**

(1) Prove that $\nabla = 1E^{-1}$

(2) Show that $\Delta = E\nabla$

(3) Prove that $\Delta \log\big(f(x)\big) = \log\left(1 + \frac{\Delta f(x)}{f(x)}\right)$

(4) Prove that $\delta = E^{1/2} - E^{-1/2}$

(5) Write the order and degree of difference equation $f^3(x).f^4(x+1) - 2f(x).f(x+2) + 4f^2(x+3) = f(x)$

(6) Find the value of $\Delta\{(x+1)(x+2)\}, where\ h = 1$

Q.2 Attempt any TWO. **10**

(1) Using method of unknown coefficients express $f(x) = 2x^3 - 3x^2 + 3x - 10$ in factorial notations.

(2) Find the 6^{th} term by constructing difference table, where $f(0) = -3, f(1) = 6, f(2) = 8, f(3) = 12$.

(3) Let$\mu_{50} = 93245, \mu_{51} = 91556, \mu_{52} = 90748, \mu_{55} = 88204$ findu_{53}&$\mu_{54.}$

Q.3 Attempt any TWO. **10**

(1) Find solution of difference equation$2Y_{K+2} - 13y_{k+1} - 7y_k = 0$, with$y_o = 0$ & $y_1 = 1$.

(2) Find the general solution of difference equation $y_{k+3} - 5y_{k+1} + 2y_{k+1} = +8y_k = 0$, also check the solution is LI or not

(3) Find the general solution of difference equation $y_{k+2} + 5y_{k+1} + 6y_k = 0, y_0 = 0$ & $y_1 = 1$.

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