Graphic Era HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011) University under section 2(f) of UGC Act, 1956

Term Evaluation (Even) Semester Examination March 2025

Roll no.....

Name of the Course: **B.TECH**
Semester: **2nd**
Name of the Paper: **Engineering Mathematics-II**
Paper Code: **TMA 201**
Time: 1.5 hour **Maximum Marks: 50**

Note:
(i) Answer all the questions by choosing any one of the sub-questions
(ii) Each question carries 10 marks.

Q1. CO 1 (10 Marks)

a. Test the convergence of the series $\frac{1}{1.2.3}+\frac{3}{2.3.4}+\frac{5}{3.4.5}+\ldots\infty$.

OR

b. Test the convergence of the series $\frac{1^2.2^2}{1!}+\frac{2^2.3^2}{2!}+\frac{3^2.4^2}{3!}+\ldots\infty$.

Q2. CO 1 (10 Marks)

a. Test the following series for convergence

$$\sum\frac{1}{\sqrt{n+1}-1}.$$

OR

b. Test the following series for convergence

$$\sum\left(\frac{n}{n+1}\right)^{n^2}.$$

Q3. CO 2 (10 Marks)

a. Solve $(xy^2+x)dx+(yx^2+y)dy=0$

OR

b. Solve $(D^3-3D^2+4)y=0, where D\equiv\frac{d}{dx}$

Q4. CO 2 (10 Marks)

a. Solve $(D^2+D+1)y=(1+e^x)^2$.

OR

b. Solve $\frac{d^2y}{dx^2}+a^2y=tan\,a\,x$.

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Q5

CO 2 (10 Marks)

a. Solve $\frac{d^2y}{dx^2} + 4y = cos2x$.

OR

b. Solve by the method of Variation of Parameters $\frac{d^2y}{dx^2} - y = \frac{2}{1+e^x}$.