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Roll No. ....

FOURTH SEMESTER

B.Tech. (EP)

MID SEMESTER EXAMINATION

(*March-2019*)

EP-208 COMPUTATIONAL METHODS

Time: 1.5 Hours

Max. Marks: 25

Note :	Attempt all questions.
	Assume suitable missing data, if any.

1. Derive the general formula to find out the maximum permissible error. If $F = \frac{xy^3}{z^2}$, find the maximum possible error in F at $x = 1$, $y = 2$, $z = 4$, given that $dx = 0.1$, $dy = 0.01$ and $dz = 0.1$. [5]

2. Graphically explain the process of finding the root by Regula-Falsi and Secant method. Use Newton-Raphson method to find out the real root of $x \log_{10} x = 1.2$ using three iterations. Use $x_0 = 2$ as initial condition for solving the equation. [5]

3. Show that [5]

   (i) $\mu\delta = \frac{\Delta E^{-1}}{2} + \frac{\Delta}{2}$

   (ii) $\Delta^3 y_2 = \nabla^3 y_5$

4. Using Newton's Finite Divided Difference Method, calculate the value of the function at $x = 2.75$. [5]

x	2.5	3.0	4.5	4.75	6.0	7.0
$f(x)$	8.85	11.45	20.66	22.85	38.6	55.6

5. Write down the difference table and mark the elements used in the Bessel's formula of interpolation. Use these elements with their respective coefficient to deduce the Bessel's formula. [5]

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