2020
MATHEMATICS – GENERAL
SEMESTER-3
Course: GE3/ CC3
INTERNAL ASSESSMENT
Full Marks: 10

The figures in the margin indicate full marks .
Symbols and notations used here carry their usual meaning.
Candidates are required to give their answers in their own words as far as practical.

Answer all the questions with proper justification: 5x2=10

1. If the step length is 1, then the value of $\left(\frac{\Delta^2}{E}\right)x^3$ is
   a) $6x^3+1$
   b) $6x$
   c) x^2+6
   d) $x+1$

2. Rank of the matrix $A=\begin{bmatrix}2 & 3 & 5\\ 4 & 6 & 10\end{bmatrix}$ is
   a) 1
   b) 3
   c) 2
   d) None of the above

3. The value of $\int_0^1 tan^{-1}x\ dx$ is
   a) $\frac{\pi}{4}-ln2$
   b) $\frac{\pi}{2}-\frac{1}{2}ln2$
   c) $\frac{\pi}{4}-\frac{1}{2}ln2$
   d) $\frac{\pi}{2}-ln2$

4. The L.P.P. in the standard maximization form is
   Maximize $z=x_1-x_2+x_3$ subject to $x_1+x_2-3x_3\geq 4, 2x_1-4x_2+x_3\geq -5, x_1+2x_2-2x_3\leq 3;\ x_1\geq 0, x_2\geq 0, x_3\geq 0$ which is transformed as
   Maximize $z=x_1-x_2+x_3+0x_4+0x_5+0x_6$ then which one of the following statement is true?
   a) x_4 and x_5 are surplus variables and x_6 is a slack variable
   b) x_4, x_5, x_6 all are surplus variables
   c) x_4, x_5, x_6 all are slack variables
   d) x_4 is surplus variable and x_5 and x_6 are slack variables

5. The value of $\int_{-2}^{2}\frac{x^2 sinx}{x^6+12}$ dx is
   a) 2
   b) 4
   c) 1
   d) 0