N.C.I.T.

Sample questions

Level: Bachelor semester: Fall Year: 2022

Programme: SE Full Marks:100

Course: Engineering mathematics 1 Pass marks: 45

SET: B Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all questions.

1 (a) Prove that differentiability of the function f(x) at x=a implies continuity at x=a. But converse is not always true. [5]

OR

Check the continuity and differentiability of the function



At x=1 and x=2.

(b) Show that  by using Lagrange’s Mean value theorem. [5]

(c) Find the expansion of  in Maclaurin’s series. [5] 2 (a) Find asymptotes of the curve: [8]

OR

Find the radius of curvature of the curve  at (0, 0).

(b) Find reduction formula for:  and evaluate [7]

3 (a) Integrate:  [5]

(b) Evaluate:  [5]

(c) Find the area bounded by ,on the left  and below by x-axis [5]

4 (a) Find the volume of solid generated by revolution of the region bounded by  and  about y= -2 [7]

OR

Find the area of the surface generated by revolving the curve  , about x-axis.

(b)Find absolute maxima and minima of  in triangular region with vertices

(2, 0), (0, 2) and (0, -2).

OR

If the sum of dimension of a rectangular pool is given. Prove that the amount of water in the pool is maximum when it is cube. [8]

5 (a) Solve:  [7]

(b) Define Riccati,s equation. Solve  [8]

6 (a) Solve: . [7]

(b) Solve: . [8]

7. Answer the following : 

(a) Find nth order derivative of 

(b) Plot parametric curve 

(c) If. Find value of 

(d). Verify Euler’s theorem for 

(e) Find arc length of parabola , from x= 0 to 