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: A 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) If , show that  [5]

(b) Evaluate [5]

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

OR

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

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

OR

Evaluate: 

3 (a) Integrate:  [5]

(b) Evaluate:  [5]

(c) Find the area bounded by  and  [5]

4 (a) Find the volume of solid generated by revolution of the region bounded be  , about y=1 [7]

OR

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

(b) Find the dimension of rectangular box open at the top of maximum volume whose surface area is 432 square centimeter [8]

OR

Find the shrtest and longest distance from the point (1, 2, -1) to the sphere 

5 (a) Solve:  [7]

(b) A tank initially contains 40 kg of salt dissolved in 200 liters of water.Suppose that the salt solution 2kg of salt per liter is allowed to enter the tank at a rate of 5 liter/min and the uniform solution is drained from the tank at the same rate. Find the amount of salt in the tank after 30 minutes. [8]

6 (a) Solve: . [7]

(b) Solve: . [8]

7. Answer the followig . 

(a) Find nth order derivative of 

(b) Plot parametric curve 

(c) If . Find value of 

(d). Verify Eulr’s theorm for 

(e) Find arc length of parabola , from x= -4 to x=4.