SIMATS ENGINEERING

SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES

MODEL EXAMINATION

Q. No ANSWER ALL QUESTIONS

1 (a) Find the Taylor's series of the function f(x) = 1/x about the point

x = 2 up to 3 terms.

(b) Evaluate lim[sec (x)]^cot (x) using L' Hôpital rule.

t→π/2

2 Obtain the extremum values for the function 10x^6 - 24x^5 +15x^4 - 40x^3+108.

3 (a) Evaluate the double integral ∫∫R xydx dy where R is the region in

the positive quadrant bounded by the line 2x + 3y = 6.

(b) Estimate the area of ellipse x^2/a^2 + y^2/b^2 = 1.

4 Compute the volume of the sphere x^2 + y^2 + z^2 = 9.

5 (a) If u = cos^-1 ((x-y)/(√x+√y)) then find x ∂u/∂x + y ∂u/∂y

(b) Compute ∂(x,y)/∂(u,v), if u = y^2/x, v = x^2/y.

6 A rectangular box open at the top, is to have a given capacity K. Find

the dimensions of the box which requiring least material for its

construction.

7 Test the consistency of the following system of equations x + y + z =6;

x + 2y - 2z = -3; 2x + 3y + z = 11 and hence solve them.

8 Solve the system of equations 2x + y + 2z = 10 ; 2x + 2y + z = 9;

x + 2y + 2z = 11 by Gauss Jordan method.

9 Find the spectral values and latent vectors of A= [ 8 -6 2 ]

[ -6 7 -4]

[ 2 -4 3 ]

10 If A = (1 2; 2 -1) then express A^n in terms of A and I.