C 56410

(Pages : 2)

Name..

Reg. No...

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION JUNE 2009

CE 04 704—COMPUTATIONAL METHOD AND OPERATIONS RESEARCH

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

*Answer **all** questions.*

I. (a) Describe briefly the successive approximation method.

(b) Explain about false position method.

(c) Explain Jacobi's method for determining Eigenvalues and vectors.

(d) Explain the lagrangian interpolation concept.

(e) Explain about numerical integration using Simpsons formulae.

(f) Explain Taylor series method for determining numerical solution of ordinary differential equations.

(g) Explain duality in Linear programming problems.

(h) What do you mean by degeneracy ?

$(8 \times 5 = 40$ marks$)$

II. (a) Find the root of the equations correct to three decimal places by method of false position :

(i) $x^3 - 4x - 9 = 0$

(ii) $x = \cos x$

(iii) $x \tan x = -1$

Or

(b) Find the roots of the equations correct to three decimal places using Newton/Raphson method :

(i) $x^3 - 3x - 5 = 0$; (ii) $3x - 1 = \cos x$.

(15 marks)

III. (a) The following data are :

Temperature °C	140	150	160	170	180
Pressure (kg/cms)	3.685	4.854	6.302	8.076	10.225

using Newton's formulae find pressure of steam for a temperature of 142°C.

Or

(b) Given the values :

$x \rightarrow$	0	2	3	6
$f(x) \rightarrow$	−4	2	14	158

(15 marks)

Turn over

IV. (a) Find the value of $\int_1^2 \frac{dx}{x}$ by Simpson's rule. Hence find approximate value of $\log_e 2$.

Or

(b) Evaluate $\int_0^1 \frac{dx}{1+x}$ correct to 3 decimals by trapezoidal rule with $h = .5, .25$ and 0.125.

(15 marks)

V. (a) A manufacturer wants to ship 8 loads of his product as shown below. The matrix gives mileage from origin 0 to Destination (D).

	A	B	C	Available
X	50	30	220	1
Y	90	45	170	3
Z	250	200	50	4
Requirement	4	2	2	

Shipping costs are Rs. 10 per road mile. What shipping should be used ?

Or

(b) Maximize $Z = 3x_1 + 2x_2$

subject to $x_1 + x_2 \leq 4$.

$x_1 - x_2 \leq 2$

(15 marks)

[4 × 15 = 60 marks]