MTMH105

First Semester M.TECH (Mathematics Engineering)

Examination Aug/Sep-2015

Numerical Analysis

Time:-3Hours **Max. Marks: -80**

Section-A

Answer any five questions: **(6*5)**

Q1. Find the value of 3 from $\int_0^1 \frac{x^2}{1+x^3}dx$, using simpson's 1/3 rule by Dividing the range into four equal parts. Also find the error.

Q2. Represent the function

$f(x) = x^4 - 12x^3 + 24x^2 - 30x + 9$

and its successive differences into factorial notation.

Q3. Show that $Y_{k+2} - 4_{k+1} + 4Y_k = 0$….(i)[K= 0,1] has the solution.

Q4. Write down the Lag range's Interpolation formula for unequal intervals.

Q5. Use Stirling's formula to find Y_{28} given:

Y_{20}= 49225, Y_{25}= 48316, Y_{30}= 47236, Y_{35}= 45926, Y_{40}=44306

Q6. Show that $\int_0^1 \frac{dx}{1+x}$ = log2 = 0.69315

Q7. Given Y_{20} = 24, Y_{24} = 32, Y_{28} = 35, Y_{32} = 40, Find y_{25} by Bessel formula.

Q8. Evaluate $\int_0^4 e^x\,dx$, by Simpson's rule, using the data e = 2.72, e^2 = 7.59, e^3 = 20.09, e^4 = 54.60 and compare it with the actual value.

Section- B

Answer any two questions: **(10×2)**

Q11 Solve the following system of equation by

a) Gauss seidal Interation method.

b) Jacobi Interative method.

27x + 6y – z = 85,

bx + 15y – 2z = 72,

x + y + 54z = 110.

Section- C

Answer any two questions: **(15×2)**

Q12. Let A $\begin{pmatrix} 3 & 12 & 9 \\ 2 & 10 & 12 \\ 1 & 12 & 2 \end{pmatrix}$ then find two triangular Matrices: L (lower triangular) and U appear triangular) such that A = LU, using the diaenal elements of < as 3, 1, 5. Hence obtain A^{-1}

Q13. Solve by relaxation method the Laplace equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$. Inside the square bounded by lines z = 0, z = 4z y = 0, y = 4, given that $u = x^2y^2$ on the boundary.

Q14. Explain in detail the solution of elliptic equations by Relaxation method. Also write its working methods.