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Roll #

(Printed Pages 4)

3. State Trapezoidal rule and Simpson's one third rule of integration.

4. Find  $\Delta^2 x$  if  $h=1$ , where  $\Delta$  is forward difference operator.

5. Given

$$\frac{dy}{dx} = f(x, y)$$

$y = y_0$  at  $x = x_0$

Write the formula for  $K_1, K_2, K_3$  &  $K_4$

(Runge Kutta Fourth order formula)

### Section-B

Note : Attempt any **two** questions out of the **three** questions. Each question carries **7½** marks.

6. Evaluate  $\int_0^6 \frac{dx}{1+x^2}$  using Simpson's  $\frac{3}{8}$  rule.

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P.T.O.

7. Prove that the role of convergence of Newton-Rapson method is quadratic.

8. The value of y and x are given as below

x: 5 6 9 11

y: 12 13 14 16

Find the value of y when x=10

### Section-C

Note : Attempt any **three** questions out of the following **five** questions. Each question carries **15** marks.

9. (a) Find a real root of equation  $x^3+29x-97=0$  by Bisection method, correct to three places of decimal.

(b) Obtain  $(12)^{1/3}$ , to five place of decimal by Newton's Raphson method.

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10. Use Stirling formula to find  $y_{35}$  given

$$y_{20}=512, y_{30}=439, y_{40}=346, y_{50}=243$$

11. From the table given below for what value of x; y is minimum

x	3	4	5	6	7	8
y	0.205	0.240	0.259	0.262	0.250	0.224

12. Apply Gauss-Seidal iteration method to solve the equations

$$2x+y-2z=17$$

$$3x+20y-z=-18$$

$$2x-3y+20z=25$$

13. Use Picard's method to approximate y when  $x=0.2$  given that  $y=1$  when  $x=0$  and  $\frac{dy}{dx} = x-y$

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