

Register Number :

Name of the Candidate :

5 2 7 8

B.Sc. DEGREE EXAMINATION, 2013

(MATHEMATICS)

(THIRD YEAR)

(PART - III : GROUP : A - MAIN)

(PAPER - V)

720. NUMERICAL METHODS AND

TRIGONOMETRY

May] [Time : 3 Hours

Maximum : 100 Marks

*Answer any FIVE questions.
ALL questions carry EQUAL marks.*

1. (a) Find the values of y at $x = 21$ from the following data :

$x :$	20	23	26	29
$y :$	0.3420	0.3907	0.4384	0.4848

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(b) Find y when $x = 16$ by Stirling's formula.

$x :$	0.5	10	15	20	25	30
$y :$	0.0875	0.1763	0.2679	0.3640	0.4663	0.5774

2. (a) Find $\frac{dv}{dt}$ at $t = 1.1$

from the following table:

$t :$	1.0	1.1	1.2	1.3	1.4
$v :$	43.1	47.7	52.1	56.4	60.8

$$\cos \theta = \frac{x+1}{x} \int_0^{\theta} \cos x \, dx$$

(b) Using Simpson's one-third rule, evaluate

(Take $n = 6$.)

3. (a) Find the positive root of $x^3 - x - 1 = 0$ by Regula Falsi method.

(b) Find by Newton's method, the root of the equation $x^4 - x - 10 = 0$, which is nearer to 2.

10. (a) If $\frac{\tan \theta}{\theta} = \frac{2524}{2523}$,

find θ approximately.

(b) If

prove that

$$\cos 2x + \cos h 2y = 2.$$

(b) Solve, by Crouts method the following :

$$x + y + z = 3.$$

$$2x - y + 3z = 16.$$

$$3x + y - z = -3.$$

7. (a) Use Euler's Method to find $y(0.4)$ given $y' = xy$, $y(0) = 1$.

(b) Apply the fourth order Runge-Kutta method to find $y(0.2)$ given that $y' = x + y$, $y(0) = 1$.

8. (a) If

$$\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \frac{\pi}{4},$$

show that $x + y + z = xyz$.

(b) Find all the values of

9. (a) Solve :

$$x^y + x^4 + x^3 + 1 = 0.$$

(b) Prove that

$$\frac{\sin 7\theta}{\sin \theta} = 7 - 56\sin^2 \theta + 112\sin^4 \theta - 64\sin^6 \theta.$$

4. (a) Find the root of the equation $x^4 - 16x + 16 = 0$, nearer to 1, by the iteration method.

(b) Solve the equation

$$x^3 - 2x^2 - 5x + 6 = 0,$$

using Graeff's Method.

5. (a) Solve the following equations by Gauss-Seidal iterative method :

$$27x + 6y - z = 85.$$

$$6x + 15y + 2z = 72.$$

$$x + y + 54z = 110.$$

(b) Using Taylor's series method, find y at $x = 0.1$ ($\cdot 1$) 0.3

given

$y(0) = 1$ (correct to 4 decimal places).

6. (a) Solve by Gauss elimination method :

$$5x_1 - x_2 - 2x_3 = 142.$$

$$x_2 - 3x_3 = -30.$$

$$2x_1 - x_2 - 3x_3 = 5.$$

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