CODE: 17CA54201

B. Tech I Year II Semester (R17) Regular Examinations, May/June - 2018

MATHEMATICS - II

(Common to all branches)

Time: 3 hours Max Marks: 70

PART – A

1. Answer any **TEN** questions (10 x 2 = 20 Marks)

(a) Write the normal equations of the curve $PV^{\gamma} = a$ (constant) where P is the dependent and V is the independent variable

(b) Explain the Newton raphson method to find a root of the equation f(x)=0.

(c) Write the Lagrange's interpolation formula given (x1,y1), (x2,y2) and (x3,y3).

(d) State Simpson's 1/3rd and Simpson's 3/8th rule.

(e) Write the formula of modified Euler's formula.

(f) Write Milne's – Predictor corrector formula.

(g) Sketch the region of integration in evaluating the $\int_0^1 \int_{\sqrt{y}}^{2-y} f(x,y)dxdy$.

(h) Evaluate $\int_0^1 \int_0^1 \int_0^{1-x} xdydxdz$.

(i) State Green's theorem in a plane.

(j) Explain geometrical interpretation of gradient of a vector point function.

(k) State Gauss divergence theorem.

(l) Evaluate $\int_0^1 \int_x^{\sqrt{x}} xydxdy$.

PART - B

Answer all **FIVE** units (5 x 10 = 50 Marks)

UNIT-I

2. Fit a curve of the form $y=ab^x$ for the following data and estimate the value of y when x=8

x	1	2	3	4	5	6	7
y	87	97	113	129	202	195	193

OR

3. Find a real root of the equation x3-9x+1=0 by bisection method correct the root to 3 decimals.

UNIT-II

4. The area of a circle(A)corresponding to diameter(D)is given below

D	80	85	90	95	100
A	5026	5674	6362	7088	7854

Find the area corresponding to the diameter 105 using Newton Backward Interpolation formula

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OR

5. Obtain an interpolating polynomial that passes through the points (0,2),(1,3), (2,12), (5,147) by Lagranges Interpolation formula

UNIT-III

6. Using Modified Euler's method, find y at x=0.1 and at x=0.2 given $\frac{dy}{dx} = y - \frac{2x}{y}, y(0) = 1.$

OR

7. Using Taylor series method find y at x=0.1(0.1)0.4 given that $\frac{dy}{dx} = x^2 - y, y(0) = 1$

(use iteration scheme)

UNIT-IV

8. Evaluate $\int_0^\infty \int_0^x xe^{-x^2/y}\, dydx$ by changing order of integration.

OR

9. Find the area enclosed by the curve r=a(1+cos θ) between θ=0 to $\theta = \pi$.

UNIT-V

10. Find the directional derivative of $\phi = xy^2 + yz^3$ at(1,-2,-1)in the direction of the normal to the surface x logz-y^2=-4 at (-1,2,1)

OR

11 Using Gauss divergence theorem evaluate $\iint_s f.\hat{n}\, ds$ over the entire surface of the region above xy-plane bounded by the cone $z^2=x^2+y^2$ and the plane z=4 where $\vec{f} = 4xzi + xyz^2 j + 3zk$.

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