CODE: 17CA54201

B. Tech I Year II Semester (R17) Supplementary Examinations, July/August - 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) State intermediate value property.

(b) Write the normal equations of the straight line y=a + bx.

(c) Write Stirling's formula.

(d) Write Simpson's $3/8^{th}$ formula.

(e) Explain Taylor's series method for solving ODEs.

(f) Using Euler's method, Solve: (dy/dx) = x +y, y(0)=1 at x=0.2.

(g) Evaluate $\int_1^2 \int_0^{y/2} ydydx$.

(h) Evaluate $\int_0^{\pi/2} \int_0^a \int_0^{r^2} rdzdrd\theta$.

(i) Convert the integral $\int_0^{2a} \int_0^{\sqrt{2ax-x^2}} f(x,y)dydx$ into polar coordinates.

(j) Define divergence and curl of a vector point function.

(k) Define a solenoidal and irrotational vector.

(l) State Stokes theorem.

PART - B

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

UNIT-I

2. Fit a curve of the form $y=a+bx^2$ for the data given below,

x	10	20	30	40	50
y	8	10	15	21	30

OR

3. Find a real root of the equation cos x=3x-1 using regula falsi method.

UNIT-II

4. From the following table, find the number of students who have scored marks at 45 by Newton's Forward interpolation formula.

Marks	30	40	50	60	70
No. students	31	42	51	35	31

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OR

5. Evaluate $\int_0^{0.6} e^{-x^2}\,dx$ using Simpson's $1/3^{rd}$ rule by dividing the interval into six equal parts.

UNIT-III

6. Apply Runge –Kutta metod of fourth order to find Y(0.2) given that (dy/dx)=x+y, Y(0)=1, h=0.1.

OR

7. Using Milne's- Predictor corrector formula find y(2) given that(dy/dx)=(x+y)/2, Y(0)=2,y(0.5)=2.636,y(1)=3.595,y(1.5)=4.968.

UNIT-IV

8. Evaluate $\iint_R x^2 y\,dxdy$ where R is the region bounded by the lines y=x, y+ x=2 and Y=0.

OR

9. Evaluate $\int_0^{\log 2}\int_0^{x}\int_0^{x+\log y} e^{x+y+z}\,dzdydx$.

UNIT-V

10. Find the angle between the normals to the surface $xy=z^2$ at the point (1,4,2) and (-3,-3,3).

OR

11. Verify Stoke' s theorem for $\vec{f} = (2x-y)i - yz^2 j - y^2 zk$ where S is the upper half of the sphere $x^2+y^2+z^2=1$,C is its boundary.

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