

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Semester Examination Backlog, October- 2024

B. Tech. (CSE), Semester V

Roll No.....

AS1110: DIFFERENTIAL EQUATIONS

Time: 3hrs

Max. Marks: 40

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1. Write the accuracy of the following Numerical methods: [AS1110:2, 2 marks]
 - (a) Second-order Runge-Kutta method
 - (b) Fourth-order Runge-Kutta method
 2. Solve the differential equations using Numerical methods: [AS1110:2, 6 marks]
 - (a) Compute y at $x = 0.2, 0.4$ by fourth order Runge-Kutta method from the differential equations, $dy/dx = 1 + y^2, y(0) = 0$.
 - (b) Compute y at $x = 0.01, 0.02$ by second order Runge-Kutta method from the differential equations $dy/dx = x + y, y(0) = 1$
 3. Solve the following differential equations: [AS1110:3, 6 marks]
 - (a) $(D^2+4D+4)y = e^{2x} - e^{-2x}$
 - (b) $(D^2-2D+1)y = x \sin x$
 4. Solve the following differential equations using Cauchy Euler Method: [AS1110:3, 8 marks]
 - (a). $(3x + 2)^2 y'' + 3(3x + 2) y' - 36y = 0$
 - (b). $x^2 y'' + 3xy' + 4y = x^2$
 5. Solve the following differential equations using the method of Variation of Parameters: [AS1110:3, 6marks]
 - (a). $(D^2+9)y = \csc 3x$
 - (b). $x^2 y'' + xy' - y = x^2 e^x$
 6. Solve the following differential equations using the method of Undetermined Coefficients: [AS1110:3, 6 marks]
 - (a) $y'' + 4y' - 2y = 2x^2 - 3x + 6$
 - (b) $y'' + y' = x^2$
 7. Solve the system of linear differential equations [AS1110:3, 6 marks]
$$2 \frac{dx}{dt} - 2 \frac{dy}{dt} - 3x = t,$$
$$2 \frac{dx}{dt} + 2 \frac{dy}{dt} + 3x + 8y = 2$$