Class Test -II (JAN. - 2023)

2AMRCI- Applied Mathematics -II

(B.E. Iyr ETC A, B)

Time: 70 min. Maximum Marks:

Note: Attempt all four questions. Questions must be solved at one place. Each step should clear and well defined.

Q.1 Solve the differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = sinhx + sin\sqrt{2}x$.

Q.2 Solve the differential equation $x^2\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} + 5y = xlogx$.

Q.3 Form the Partial differential equations

(i) $x^2 + y^2 + (z-a)^2 = b^2$ (ii) $f(x+y+z,\ x^2+y^2+z^2) = 0$.

Q.4 Find the general solution of $x(z^2 - y^2)\frac{\partial z}{\partial x} + y(x^2 - z^2)\frac{\partial z}{\partial y} = z(y^2 - x^2)$.

BE –I (E & I)

CLASS TEST – 2

2AMRC1: Applied Mathematics-II

Time: 70 min

Note: Attempt any FOUR questions. ***Max Marks: 20***

Q1) Derive the partial differential equation by eliminating the arbitrary function:

$$z = (x + y)\, f(x^2 - y^2)$$

Q2) Solve the following equation: $(D^3 - 2D^2D')\, z = 2e^{2x} + 3x^2y$

Q3) Solve by the method of separation of variables: $du/dx = 2\, du/dt + u$, where $u(x, 0) = 6e^{-3x}$

Q4) Find all eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$.

Q5) Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$ and

express $A^8 - 11A^7 - 4A^6 + A^5 + A^4 - 11A^3 - 3A^2 + 2A + I$ as a quadratic polynomial in A.