P. S. SCIENCE & H. D. PATEL ARTS COLLEGE, KADI

Internal Examination

B. Sc. Semester - V [Marks - 40

26-9-2016] **Mathematics - 503** [1-30 to 3-00

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1. **[A]** $\frac{e^{ax}\,V}{f(D)} = e^{ax}\,\frac{1}{f(D+a)}V$, Where $f(D+a) \neq 0$ & V is a function of x. **5**

OR

[B] Any two. **10**

(i) Solve : $(D^2 - 1)y = e^{-x}\sin(e^{-x}) + \cos(e^{-x})$

(ii) Solve : $(D^2 - 2D + 1)y = x\,e^x \sin x$

(iii) Solve : $(D^2 + 4D + 4)y = 2\sin(h2x)$

2. **Attempt any two.** **10**

(i) Solve : $xy^{(3)} + (x^2 + x + 3)y^{(2)} + (4x + 2)y^{(1)} + 2y = 0$

(ii) Solve : $yy^{(2)} = \{y^{(1)}\}^2 [1 - y^{(1)}\cos y + yy^{(1)} \sin y]$

(iii) Solve : $y^{(2)} + y^{(1)} + \{y^{(1)}\}^3 = 0$

3. **Attempt any three.** **15**

(i) Solve : $xy^{(2)} - (2x - 1)y^{(1)} + (x - 1)y = 0$

(ii) Solve : $x\frac{d}{dx}\left(x\frac{dy}{dx} - y\right) - 2xy^{(1)} + 2y + x^2y = 0$

(iii) Solve : $xy^{(2)} - (1 + x)y^{(1)} + y = x^2$

(iv) Solve : $x^2y^{(2)} - 2x(x + 1)y^{(1)} + 2(x + 1) = x^3$

Where the integrals in the C.F are $y = x$, $y = x\,e^{2x}$.
