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

INTERNAL EXAMINATION

B.Sc. Sem -IV [Marks 40

18/09/2017 Mathematics 503 [1.45 to 3.45

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2 [A] prove that $\frac{e^{ax}v}{F(D)} = e^{ax}\frac{1}{F(D+a)}v,$

where v is a function of x, $F(D+a) \neq 0$

[B] Attempt any two :

1 solve: (D^2+1)y=$sec^2x\ x$

2 solve: (D^2-2D+1)y=x$e^x sinx$

3. solve: $(D^3-2D^2-19D+20)$y=$xe^x+2e^{-4x}sinx$

2. [A] If the linear differential equation

$P_0\,y^{(n)}+P_1\,y^{(n-1)}\ +P_2\,y^{(n-2)}+\cdots\ldots+P_n\,y=\emptyset(x),$

where $P_{0,}P_{1,}\ldots\ldots P_{n,}$ are function of x, is exact differential equation then

$$p_n+(-1)^1\,p_{n-1}^{(1)}+(-1)^2\,p_{n-2}^{(2)}+\ldots\ldots..+(-1)^n\,p_0^{(n)}=0$$

[B] Attempt any two :

1. solve: $y^{(2)}+y^{(1)}+(y^{(1)})^3=0$

2 obtain first integral of $x^2yy_2+(xy_1-y)^2-3y^2=0$

3. solve:$\sqrt{x}y^{(2)}+2xy^{(1)}+3y$=x

3. [A] if y=vz is general solution of $y^{(2)}$ +P$y^{(1)}$+Qy=R then prove that normal form of equation is $v^{(2)}+Q_1v=R,$

where $Q_1=Q$-$\frac{P^{(1)}}{2}-\frac{P^2}{4}, R_1=\frac{R}{Z}$, z= $e^{-\frac{1}{2}\int p\,dx}$

[B] Attempt any two :

1 solve: $y^{(2)}$ +$y^{(1)}$ -2y =$-2e^{-x}-5cosx$

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

3. solve : x$y^{(2)}$ –(x+1)$y^{(1)}$ +y=x^2

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