**DEPARTMENT OF MATHEMATICS**

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**MA106 Ordinary Differential Equation Session: SP/ 2020**

1. Consider the two functions and on the interval 
2. Show that their Wronskian vanishes identically.
3. Show that  and are not linearly independent.
4. Show that the solutions and of are linearly independent and hence or otherwise solve the equation.
5. Show that is the general solution of on any interval not containing 0, and find the particular solution for which and 
6. Verify that is one solution of and find second solution and the general solution.
7. Verify that one of the solution of the equation is , and find another solution valid in .
8. Solve , given that  is one solution.
9. 
10. 
11. 
12. 
13. 
14. 
15. Find the P.I. of (a)  (b)  (c) 
16. Find the C.F of (a)  (b) . (c) 
17. What is P.I. of 
18. Find general solution of D.E.  .
19. Solve $\frac{d^{3}y}{dx^{3}}+6\frac{d^{2}y}{dx^{2}}+12\frac{dy}{dx}+8y=0$ , under the condition that $y\left(0\right)=0 , y^{'}\left(0\right)=0 $and $y^{''}\left(0\right)=2 $.
20. Solve $(D+1)^{3}y=e^{-x}$ .
21. $\left(D^{2}+4\right)y=sin3x+cos2x$.
22. Solve $\left(D^{2}-4D+3\right)y=sin3x.cos2x$
23. Solve $(D^{4}-m^{4})y=\cos(mx)$ .
24. Solve $\frac{d^{2}y}{dx^{2}}+2\frac{dy}{dx}+10y+37\sin(3x)=0$ and find the value of $y$ when $=\frac{π}{2}$ , being given that $y=3$ and $\frac{dy}{dx}=0$ when $x=0$ .
25. Solve $\frac{d^{2}y}{dx^{2}}+4y=sin^{2}2x$ with the conditions that $y\left(0\right)=0 , y^{'}\left(0\right)=0 $.
26. Solve $\left(D^{3}-D^{2}-6D\right)y=1+x^{2}$
27. Solve $(D^{2}-1)y=2x^{4}-3x+1$

**Solve the following differential equations by the variation of parameters:**

1. 
2. 
3. 
4. 
5. 
6. 
7. 