C16-EC-**401**

5648

BOARD DIPLOMA EXAMINATION, (C-16)
OCTOBER/NOVEMBER-2018
DECE - FOURTH SEMESTER EXAMINATION

ENGINEERING MATHEMATICS - IV

Time : 3 Hours]   [Total Marks: 80

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PART-A

3X10=30

Instructions   :   1. Answer **All** questions.

2. Each question carries **Three** marks.

3. Answer should be brief and straight to the point and shall not exceed

five simple sentences.

1. Solve $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 4y=0$

2. Solve $(D^2 + 4D + 13)y = 0$

3. Solve $(D^3 - 5 D^2 + 8D - 4)y = 0$

4. Find the particular integral (P.I.) of the D.E. $(D^2 -1)y = \frac{e^x}{2}$

5. Find the P.I. of the D.E. $(D^2 + 4)y = Cos2x$

6. Find $L[e^{2t} - 4t^2 + 2Sin3t]$

7. Find $L [Sin5t.Cos3t]$

8. Find $L^{-1} [\frac{2}{s-4} + \frac{3}{s^2-9}]$

9. Write down the formulae for finding Fourier constants for $f(x)$ in $[-\pi, \pi]$

10. Find a_0 for $f(x) = x.sinx$ in the interval $(-\pi, \pi)$

PART-B

10X5=50

Instructions :   1. Answer any **Five** questions.
                             2. Each question carries **ten** marks.
                             3. Answer should be comprehensive and the criterion for valuation is
                                the content but not the length of the answer

11. (a) Solve $(D^2 + 4D + 4)y = 5 + e^{-2x}$

    (b) Solve $(D^2 - 9D + 18)y = \cosh 3x$

12. (a) Solve $(D^2 - 4)y = 2Cos^2 x$

    (b) Solve $(D^2 + D - 2)y = x^2$

13. (a) Find L $[(t + 2)^2 e^t]$

    (b) Find L $\left[\dfrac{e^t + \cos t}{t}\right]$

14. (a) Find $L^{-1} \left[\dfrac{3s-12}{s^2+8}\right]$

    (b) Find $L^{-1} \left[\dfrac{s}{(s+2)(s-1)}\right]$

15. State Convolution theorem and use it to find $L^{-1} \left[\dfrac{1}{s(s^2+4)}\right]$

16. Solve the differential equation by Laplace Transform Method, $y^{||} + 3y^{|} + 2y = e^{-t}$,

    given that $y(0) = y^1 (0) = 0$

17. Obtain the Fourier series of $f(x) = x^2$ in the interval $(0,2\pi)$

18. Find the Fourier series to represent the function $f(x) = |\sin x|$, $-\pi < x < \pi$

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