C14-EC/CHPC/PCT-403

4455

BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2018
DCE—FOURTH SEMESTER EXAMINATION

ENGINEERING MATHEMATICS - III

Time : 3 Hours]   [*Total Marks* : 80

PART—A   3×30=30

Instruction : (1) Answer **all** questions and each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed **five** simple sentences.

1. Solve $y'' - 3y' + 2y = 0$

2. Solve $(D^2 + 4)\, v = 0$ where $D = \dfrac{d}{dx}$

3. Find the particular integral of $(D^2+1)\, y = \sin x$

4. Find $L[e^{2t} + t^3]$

5. Find $L(t^2 e^{2t})$

6. Find $L^{-1}\left(\dfrac{s}{s^2 - 4} + \dfrac{3}{s^2 + 1}\right)$

7. Find $L^{-1}\left(\dfrac{1}{s^2 - 3}\right)$

8. If $f(x) = x^2$ in $(0, 27\pi)$ what is the value of ao in Fourier series of f(x).

9. Write the, formula for half range sine series of $f(x)$ in (0,1)

10. 10.If two balls are drawn at random from a bag containing 5 red, 3 white and 2 black balls, what is the probability that they are not white.

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PART—B   10×5=50

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Instruction : (1) Answer any **five** questions and each question carries **ten** marks.

(2) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Solve $(D^2 - 4D + 13)\ y = e^{-2x}$

    (b) Solve $(D^2 - 3D + 2)\ y = 5x^2$

12. *(a)* Solve $(D^2 + 4)\ y = \cos 3x \cos x$

    (b) Solve $(D^2 - 6D + 9)\ y = \sinh 2x$

13. *(a)* Find $L\left(\dfrac{\sin 2t \cos 4t}{t}\right)$

    (b) $L^{-1}\left(\dfrac{s-3}{2(s^2-3)\,25}\right)$

14. Use Laplace transform method to solve $y'' - 3y' + 2y = 2e^{3:}$ given that y(0) = 2, $y'(0) = 3$

15. Find the Fourier series to represent the function $f(x) = x - x^2$ when -1<x<1

16. If $f(x) = \left[\dfrac{\pi-x}{2}\right]^2$ Find the Fourier casing series in the interval $(-\pi, \pi)$

17. *(a)* If $2P(A) = P(B) = 5/13$ and $P(A/B) = 2/5$, then find $P(AUB)$.

    (b) A bag contains 5 white and 3 red balls. Two balls are drawn from the bag one after the other without replacement. What is the probability that both drawn balls are white?

18. *(a)* Define *(i)* Addition theorem

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(ii) Multiplication theorem on probability.

(b) In a class, 40% students read Mathematics, 25% read Physics and 15% read both Mathematics and Physics. One student is selected at random. Find the probability that he reads Mathematics, if it is known that he reads Physics.

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