



C14-EC/CHPC/PCT-403

4455

BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2018
DECE—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 $D = \frac{d}{dx}$

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 $L^{-1}\left(\frac{s}{s^2-4} + \frac{3}{s^2+1}\right)$

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

8. If $f(x) = x^2$ in $(0, 27\pi)$ what is the value of a_0 in Fourier series of $f(x)$.

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

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.

PART—B

10×5=50

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 $L\left(\frac{\sin 2t \cos 4t}{t}\right)$

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

14. Use Laplace transform method to solve $y'' - 3y' + 2y = 2e^{3x}$ 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 $f(x) = \left[\frac{\pi - x}{2}\right]^2$ Find the Fourier series in the interval $(-\pi, \pi)$

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

(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

(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.

030 030 030 030 030

*

*