



C14-EC-401/C14-CHPC-
401/C14-PCT-401

4455

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2018
DECE-FOURTH SEMESTER EXAMINATION
ENGINEERING MATHEMATICS-III

Time : 3 hours]

[Total Marks : 80

PART—A

10×3=30

Instructions: (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Solve $(D^2+6D+9)y= 0$
2. Solve $(D^3-3D^2+3D-1)y= 0$
3. Find the particular integral of $(D^3-1)y= e^x$
4. Find $L\{3+5t+2 e^t+8\sin 2t\}$
5. Find $L\{\cos 4t \cos 2t\}$
6. Find $L\{t \sin 2t\}$
7. Find $L^{-1}\{t e^t \sin 3t\}$
8. Write down the Fourier series expansion of a function $f(x)$ in the interval $(C, C + 2\pi)$. Give the formula for finding the Fourier coefficients.
9. Find the value of b_n for the function $f(x) = x$ in the interval $(0, \pi)$.

10. State the mathematical definition of probability.

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PART—B

10×5=50

- Instructions :
- (1) Answer *any five* questions.
 - (2) Each question carries **ten** marks.
 - (3) Answers should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11. a) Solve $(D^2 - 3D + 2)y = 5e^{3x}$

b) Solve $(D^2 + D + 1)y = 2 \sin 3x$

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

b) Solve $(D^2 + 5D + 4)y = x^2 + 7x + 9$

13. a) Find $L\{t(\sin t + \cos t)\}$

b) Find $L\left\{\frac{e^{2t} - e^{3t}}{t}\right\}$

14. a) Find $L^{-1}\left\{\frac{S-2}{S^2+5S+6}\right\}$

b) Using convolution theorem, find the inverse Laplace transform

of $\frac{1}{S(S^2+1)}$

15. Obtain the Fourier series of $f(x) = |\sin x|$ in the interval $(-\pi, \pi)$.

16. Obtain half range cosine series for the function $f(x) = x^2$ in the interval $(0, \pi)$ and hence find the sum of the series $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots = \frac{\pi^2}{12}$

17. a) Find the probability of getting two queens when two cards are drawn from a pack of 52 cards.

b) Let A and B be two events with $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$

find (i) $P(A/B)$ (ii) $P(A \cup B)$

18. Bag I contains 3 red and 4 black balls while another Bag II contains 5 red and 6 black balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that was drawn from Bag II.

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