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C14–EE/CHPP/PET–**401**

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BOARD DIPLOMA EXAMINATION, (C–14)

JUNE—2019

DAEEE—FOURTH SEMESTER EXAMINATION

ENGINEERING MATHEMATICS—III

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

PART—A 3×10 =30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

1. Solve $(D^2 - 6D + 8)y = 0$.

2. Solve $(D^4 - 18D^2 + 81)y = 0$.

3. Find the particular integral for $(D^2 - 1)y = x^2$.

4. Find $L\{3t^2 + 2\cos 2t + e^{-t}\}$.

5. Find $L\{t^7 e^{15t}\}$.

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

7. Find $L^{-1}\left(\dfrac{2s-5}{s^2+4}\right)$.

8. Write the formulae for Fourier series of a function $f(x)$ in the interval $[c, c+2\pi]$.

9. Find the constant term in the Fourier series corresponding to $f(x) = x + x^3$ in $(-\pi, \pi)$.

10. Find the probability of getting two heads when three coins are tossed.

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

11. *(a)* Solve $(D^2 - 7D + 10)y = 3e^{5x}$.

(b) Find the particular integral of $(D^2 + D + 9)y = \sin 3x$.

12. *(a)* Solve $(D^2 - 16)y = \cosh x$.

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

13. *(a)* Find $L\{e^t(t^2 - 6t + 7)\}$.

(b) Find $L\left\{\dfrac{1-\cos t}{t}\right\}$.

14. *(a)* Find $L^{-1}\left\{\dfrac{s}{(s+1)(s+2)}\right\}$.

(b) Using convolution theorem find $L^{-1}\left\{\dfrac{1}{(s^2+9)(s+3)}\right\}$.

15. Express $f(x) = x$ as a Fourier series in $(-\pi, \pi)$.

16. Obtain the Fourier series to represent $f(x) = \frac{1}{4}(\pi - x)^2$ for the interval $(0,\ 2\pi)$.

17. *(a)* A committee of two persons is selected from two men and two women. Find the chance that the committee will have *(i)* no man, *(ii)* one man.

(b) What is the probability that a leap year, selected at random, will have 53 sundays?

18. *(a)* Two dice are tossed once. Find the probability of getting an even number on the first die or a total of 8.

(b) A problem in statistics is given to three students A, B, C whose chances of solving it are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ respectively. If they try it independently, what is the probability, that the problem will be solved?

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