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C14-A/AA/AEI/CH/CHST/
MET/MNG/TT/BM-401

4401

**BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2018
FOURTH SEMESTER (COMMON) EXAMINATION
ENGINEERING MATHEMATICS- III**

Time : 3 hours]

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.

1. Solve $(D^2+6D+9)y=0$ where $D=\frac{d}{dx}$
2. Solve $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 6y = 0$
3. Find the particular integral of $(D^2-8D+9)y=\sin 3x$
4. Find $L\{(t+1)^2\}$
5. Find $L\{e^{-t}\sin 2t\}$
6. Find $L^{-1}\left\{\frac{2}{s-4} + \frac{3}{s^2-9}\right\}$
7. Find $L^{-1}\left\{\frac{1}{s(s-1)}\right\}$
8. Find the value of a_0 in $f(x)=x$ in $0 < x < 2\pi$
9. Write down the formulae for finding Euler's constants for a function $f(x)$ in the interval $(0,2)$ in the fourier series expansion.
10. In a single throw of two dice, what is the probability of obtaining a total of 7.

PART-B

10×5=50

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

11. (a) Solve $(D^2+2D-8)y=e^{-3x}+e^{-4x}$

(b) Solve $(D^2+4)y=x^2+3$

12. Solve $(D^2+2D+1)y=e^{2x}-\cos^2x$

13. (a) Find $L\{t^2 \sin 3t\}$

(b) Find $L^{-1}\left\{\frac{1}{(s-1)(s+3)}\right\}$ using convolution theorem.

14. Use laplace transform method to solve $y''+3y'+2y=e^{-t}$ with $y(0)=0$ and $y'(0)=1$

15. Find the Fourier series for $f(x)=x-x^2$ in the interval $[-\pi, \pi]$.

16. Obtain the half-range cosine series for the function $f(x)=2x-1$ in the interval $(0, 1)$

17. (a) Four boys and four girl sit in a row at random. Find the probability that (i) the girl sit together (ii) boys and girls sit alternatively.

(b) A card is drawn from a well-shuffled pack of playing cards. What is the probability that it is either a king or a spade?

18. (a) Let A and B be two events with $P(A)=\frac{3}{8}$ $P(B)=\frac{5}{8}$ and $P(A \cup B) = \frac{3}{4}$. Find $P(A/B)$ and $P(B/A)$.

(b) An urn contains 10 black and 5 white balls. Two balls are drawn one after the other without replacement. Find the probability that both balls drawn are black.

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