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BOARD DIPLOMA EXAMINATION, (C-14)

MARCH /APRIL-2019

DCME - FOURTH SEMESTER EXAMINATION

ENGINEERING MATHEMATICS-III

Time: 3 Hours

Max.Marks: 80

PART-A

10x3=30M

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

- 1) Solve $(D^2 + 6D + 4)y = 0$
- 2) Solve $(D^3 - 5D^2 + 8D - 4)y = 0$
- 3) Find the particular integral for $(D^2 + 9)y = e^{3x}$
- 4) State the first shifting and second shifting theorems of Laplace trans-forms.
- 5) Find $L\{\sin^2 t\}$
- 6) Find $L\{te^{-t}\}$
- 7) Find the inverse laplace transform of $\frac{6}{s^2 + 4} + \frac{1}{s - 6} + \frac{1}{s^2}$.
- 8) Write the formulae for fouries seris of a function $f(x)$ in the interval $[c, c + 2l]$.
- 9) If $f(x) = x$ in $(-\pi, \pi)$ what is the values of " a_1 " in fourier series of $f(x)$.
- 10) Two dice are thrown. Find the probability that none of the dice shows number 2 given that their sum is 7.

PART-B

10x5=50M

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

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

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

12) (a) solve $(D^2-1)y = 1 + \cos 2x$.

(b) Find the particular integral of $(D^2+1)y = x$

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

(b) Find $L \left\{ \frac{e^t + \cos t}{t} \right\}$

14) (a) Find $L^{-1} \left\{ \frac{s+2}{s^2+4s+8} \right\}$

(b) Using convolution theorem find $L^{-1} \left\{ \frac{1}{(x-a)(x-b)} \right\}$

15) Obtain the fourier series for the function $f(x) = x^2$ for the interval $(-\pi, \pi)$.

16) Obtain the fourier sine series for the function $f(x) = e^x$ for the interval $(0, \pi)$

17) Find $p(A \cup B)$ if

(a) $p(A) = \frac{1}{2}, P(B) = \frac{1}{4}, P(A \cap B) = \frac{1}{8}$

(b) $p(A) = 0.25, P(B) = 0.5, P(A \cap B) = 0.16$

(c) $p(A) = \frac{2}{7}, P(B) = \frac{3}{5}$; A and B are disjoint

18) (a) A book containing 100 pages is opened at random. Find the probability that on the page a doublet is found

(b) If a page is randomly selected from a book of 100 pages, then find the probability that the sum of the digits of the pages is 10.