4477

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH /APRIL-2019

DME - 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 $(D^2+4D+4)y=0$, where $D = \frac{d}{dx}$

2) Solve y"'-2y"- y' +2y=0

3) Find the particular integral for $(D+1)^2 y=x$ where $D = \frac{d}{dx}$

4) Find the laplace transform of sin 2t sin 3t.

5) Find the laplace transform of t cos 3t.

6) Find the inverse laplace transform of $\frac{1}{2s+5}$

7) Find the inverse laplace transform of $\frac{s}{(s+3)^2+5}$

8) Define the fourier series of an even function f(x) in the interval $(-\pi,\pi)$

9) Find the value of a_0 in the fourier series explansion of f(x) =x in the interval (0,3).

10) I f one card is drawn from a well shuffled deck of 52 cards, then find the probability that the card will be (i) a diamond and (ii) not a diamond.

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 $(D^2+D+1)y = (1-e^x)^2$, where $D = \frac{d}{dx}$

(b) Solve $(D^2-4)y = \cos^2 x$, where $D = \frac{d}{dx}$

12) (a) solve $(D^2+3D+2)Y = e^x + x + \sin 2x$, where $D = \frac{d}{dx}$

13) Evaluate $L\{\int_0^t te^{-t}\sin t\, dt\}$

b) evaluate $L^{-1}\{Log(\frac{s+1}{s-1})\}$

14) Using Laplace transform method, solve $y'' + 3y' + 2y = e^{-t}$, if $y(0) = y'(0) = 0$

15) Obtain the fourier series of $f(x) = x^2$ in the interval $(0, 2\pi)$.

16) Obtain the half-range fourier sine series for $f(x) = x(\pi - x)$ in the interval $(0, \pi)$ and hence deduce that $\frac{1}{1^3} - \frac{1}{3^3} + \frac{1}{5^3} - \frac{1}{7^3} + ... = \frac{\pi^3}{32}$

17) a) Find the probability that a leap year contains 53 sundays.

b) If A and B are events with P (A) = 0.5, P(B)=0.4 and P ($A \cap B$)= 0.3, find the probability that (i) A does not occur and (ii) neither A nor B occur.

18) A) A bag contains 5 blue and 4 red balls, If two balls are drawn successively withou replacement, what is the probability that both are blue?

b) In a class, 2% of boys and 3% of girls are having blue eyes. There are 30% girls in the class. If a student is selected and having blue eyes, what is the probability that the student is a girl?

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