

6232

BOARD DIPLOMA EXAMINATION, (C-16)
MARCH /APRIL-2019
THIRD SEMESTER(COMMON) EXAMINATION
ENGINEERING MATHEMATICS-II

Time: 3 Hours

Max.Marks: 80

PART-A**10x3=30**

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

1) Evaluate $\int \tan^3 x \sec^2 x dx$.

2) Evaluate $\int \log x dx$.

3) Evaluate $\int_0^1 \frac{dx}{\sqrt{1-x^2}}$.

4) Find the area bounded by the curve $y = x^2 - 1$, the x-axis and the ordinates $x=1$ and $x=3$.

5) Find the laplace transform of $t^3 + 3 \cos 2t + 5e^{-8t}$.

6) Find $L^{-1} \left\{ \frac{1}{s^4} + \frac{3}{s^2 - 8} \right\}$

7) Find the value of a_{11} in the fourier series of $f(x)=1$ in the interval $(0, 2\pi)$.

8) Solve $\frac{dy}{dx} + \frac{y}{x} = 0$

9) Find the differential equation corresponding to $y = a \cos x + b \sin x$, where a and b are arbitrary constants.

10) Solve $(D^2 + 6D + 9)y = 0$

PART-B

10x5=50M

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

- 11) a) Integrate $\sin^2 x \cos^3 x$ w.r.t.x
b) Integrate $\sqrt{16+9x^2}$ w.r.t.x

- 12) a) Evaluate $\int x^2 \cos 3x dx$
b) Evaluate $\int_0^{\pi/2} (\log \tan x) dx$

- 13) a) Find the volume of the solid generated when the area bounded by the curve $y = x^2 - 9$ and the x-axis revolves about x-axis.
b) find the R.M.S value of $\sqrt{\log x}$ over the range $x = 1$ and $x=e$

- 14) (a) Evaluate $\int_0^6 \frac{dx}{1+x^2}$, using Simpson's 1/3 rule by taking $n=6$.
b) Using convolution theorem, find $L^{-1}\left[\frac{1}{s^2(s+3)}\right]$.

- 15) (a) Find $L(t^2 \sin 2t)$
(b) If $L^{-1}[F(s)] = f(t)$ write the values of

(i) $L^{-1}(s.F(s))$ (ii) $L^{-1}\left[\frac{F(s)}{s}\right]$ (iii) $L^{-1}\left[\frac{d}{ds}F(s)\right]$ (iv) $L^{-1}\left[\int_s^\infty F(s) ds\right]$ (v) $L^{-1}[F(as)]$

- 16) Find the fourier series for the function $f(x) = \pi^2 + x^2$ in the interval $[-\pi, \pi]$

* 17) a) Solve $\frac{dy}{dx} + \frac{y}{x} = 5x$

b) Solve $e^y dx + (xe^y + 2y)dy = 0$

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

b) Solve $(D^2 + D)Y = \cos 2x$

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