



C09-A-302/C09-AA-302/C09-AEI-302/C09-C-302/
C09-CM-302/C09-EC-302/C09-EE-302/C09-CH-302/
C09-CHPP-302/C09-CHPC-302/C09-CHOT-302/
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BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL—2017
THIRD SEMESTER (COMMON) EXAMINATION

ENGINEERING MATHEMATICS—II

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

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

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

1. Evaluate $\sec^2 x \sqrt{\tan x} dx$.

2. Evaluate $\frac{dx}{\sqrt{13x^2 - 5}}$.

3. Evaluate $x^7 \frac{3}{x} \sin x dx$.

4. Evaluate $\sin(3x - 7) dx$.

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5. Evaluate $\int x e^x dx$.
6. Evaluate $\int \frac{\cot x}{\log(\sin x)} dx$.
7. Evaluate $\int \frac{\frac{\sqrt{3}}{2}}{\frac{1}{\sqrt{2}} \sqrt{1-x^2}} dx$.
8. Find the particular integral of $(D^2 - 1)y = \cos 3x$.
9. Solve $\int \sqrt{1-y^2} dx = \int \sqrt{1-x^2} dy = 0$.
10. Find the differential equation whose solution is $y = Ae^{-x} + Be^x$ where A, B are arbitrary constants.

PART—B

10×5=50

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

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

11. (a) Evaluate $\int \frac{x}{x^2 - 12x + 35} dx$.
- (b) Evaluate $\int \tan^{-1} \frac{3x - x^3}{1 - 3x^2} dx$.
12. (a) Evaluate $\int \cos^3 x \sin^4 x dx$.
- (b) Evaluate $\int \cos 2x \cos x dx$.
13. (a) Find the volume of the cylinder with radius r and height h using the method of integration.
- (b) Find the RMS value of $\sin pt + \cos qt$ in the range $t = 0$ to $t = 2\pi$, where p, q are integers.

- 14.** (a) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin^{20} x}{\sin^{20} x \cos^{20} x} dx$.
- (b) Find the area bounded by the parabola $y^2 = 4x$ and the line $x + y = 3$.
- 15.** Solve $(x^2 + 2xy) dy = (y^2 + 2xy) dx$.
- 16.** (a) Solve $(1 - x^2) \frac{dy}{dx} = 2xy - x^3$.
- (b) Solve $(D^2 - 1)y = e^x$.
- 17.** (a) Solve $(D^2 - 4)y = \cos x$.
- (b) Solve $(D^2 - 4)y = x^3$.
- 18.** (a) Evaluate $\int_0^{\frac{\pi}{2}} \sqrt{\sin x} dx$ with Simpson's rule by dividing the range of interval into six equal parts.
- (b) Solve $\frac{dy}{dx} = (9x - y - 1)^2$.

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