



C09-A-302/C09-AA-302/C09-AEI-302/C09-CH-302/
C09-CHST-302/C09-IT-302/C09-MET-302/
C09-MNG-302/C09-PKG-302/C09-TT-**302**

3202

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2013

THIRD SEMESTER (COMMON) EXAMINATION

ENGINEERING MATHEMATICS—II

Time : 3 hours]

[Total Marks : 80

PART—A

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

1. Evaluate :

$$\frac{e^{\tan^{-1} x}}{1-x^2} dx$$

2. Evaluate :

$$\frac{1}{\sqrt{9-x^2}} dx$$

3. Evaluate :

$$\sec(4x-7) \tan(4x-7) dx$$

*

**C09-A-302/C09-AA-302/C09-AEI-302/C09-CH-302/
C09-CHST-302/C09-IT-302/C09-MET-302/
C09-MNG-302/C09-PKG-302/C09-TT-302**

4. Evaluate :

$$\frac{\sin(\log x)}{x} dx$$

5. Evaluate :

$$(x^3 - 3^x - 2) dx$$

6. Evaluate :

$$\int_0^1 (x^5 - 1) dx$$

7. Find the mean value of $y = x^2$ between $x = 2$ and $x = 3$.

8. Solve :

$$x^6 dy - y^6 dx = 0$$

9. Solve :

$$\frac{d^2 y}{dx^2} - 3 \frac{dy}{dx} - 54y = 0$$

*

10. Form the differential equation of the family of curves $y = A \cos 3x + B \sin 3x$, where A, B are arbitrary constants.

*

**C09-A-302/C09-AA-302/C09-AEI-302/C09-CH-302/
C09-CHST-302/C09-IT-302/C09-MET-302/
C09-MNG-302/C09-PKG-302/C09-TT-302**

PART—B

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

11. (a) Evaluate :

$$\int \sin^2 x \cos^3 x dx$$

(b) Evaluate :

$$\int \sin 5x \cos 2x dx$$

12. (a) Evaluate :

$$\int \frac{1}{\sqrt{x^2 - x - 1}} dx$$

(b) Evaluate :

$$\int x^3 e^{4x} dx$$

13. (a) Evaluate

$$\int_0^{\pi/2} \frac{\cos^{14} x}{\cos^{14} x \sin^{14} x} dx$$

(b) Find the area enclosed between by the circle $x^2 + y^2 = a^2$ using the method of integration.

*

**C09-A-302/C09-AA-302/C09-AEI-302/C09-CH-302/
C09-CHST-302/C09-IT-302/C09-MET-302/
C09-MNG-302/C09-PKG-302/C09-TT-302**

14. (a) Find the volume of the solid obtained when the region

$$\frac{x^2}{9} - \frac{y^2}{4} = 1$$

is revolved about x -axis.

(b) Find the RMS value of $\sqrt{\log x}$ between $x = 1$ and $x = e$.

15. (a) Solve :

$$\frac{dy}{dx} - y = e^{-x}$$

(b) Solve :

$$(D^2 - 5D - 6)y = e^x$$

16. Solve :

$$\frac{dy}{dx} - \frac{y}{x} = \cot \frac{y}{x}$$

17. (a) Solve :

$$(D^2 - 1)y = \sin 3x$$

(b) Solve :

$$(D^2 - 1)y = x$$

18. Evaluate

$$\int_1^2 \frac{1}{x} dx$$

*

approximately by dividing the interval $[1, 2]$ into 10 equal parts using Simpson's rule.
