* 4455 *

C14–EC–401/C14–CHPC–401/C14–PCT–401

4455

BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2016

DECE—FOURTH SEMESTER EXAMINATION

ENGINEERING MATHEMATICS—III

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

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. Solve $(D^2 \quad 2D \quad 10)y \quad 0$.

2. Solve $(D^3 \quad 1)y \quad 0$.

3. Find the particular integral of $(D^2 \quad 2D \quad 1)y \quad \sin x$.

4. Find $L(\cos 4t \quad \sin 2t)$.

5. Find $L(t^7 e^{15t})$.

6. Find $L^{\ 1}\ \dfrac{s}{(s \quad 2)(s \quad 1)}$.

7. Find $L^{\ 1}\ \dfrac{2s \quad 5}{s^2 \quad 4}$.

8. Write the Fourier series for the function $f(x)$ defined in the interval $(C, C \quad 2\ )$.

9. If $f(x) \quad |x|$ in $(\quad , \quad)$, what is the value 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.

PART—B

10×5=50

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)* Solve $(D^2 \quad 3D \quad 2)y \quad x^2$.

(b) Solve $(D^2 \quad 4D \quad 5)y \quad 2\cosh x$.

12. *(a)* Solve $(D^2 \quad 4D \quad 4)y \quad \cos 2x$.

(b) Solve $(D^2 \quad 3D \quad 2)y \quad (e^x \quad 1)^2$.

13. *(a)* Find $L(t^2 \sin at)$.

(b) Find $L \dfrac{e^{\ at} \quad e^{\ bt}}{t}$.

14. *(a)* Find $L^{\ 1} \tan^{\ 1} \dfrac{1}{s}$.

(b) Using convolution theorem, find $L^{\ 1} \dfrac{1}{s(s^2 \quad 4)}$.

15. Obtain the Fourier series for the function $f(x)$ x^2 in the interval $(0, 2\ )$.

16. Find the Fourier cosine series for $f(x)$ $x \sin x$ for the interval $(0, \ )$. Hence show that

$$1 \quad \frac{2}{1\ 3} \quad \frac{2}{3\ 5} \quad \frac{2}{5\ 7} \quad \frac{2}{7\ 9} \quad \cdots\cdots\cdots \quad \frac{}{2}$$

17. *(a)* If A and B are independent events with $P(A)$ 0 2; $P(B)$ x and $P(A \quad B)$ 0 8, then find x.

(b) When four coins are tossed simultaneously, write the probability of getting 2 heads and 2 tails.

18. *(a)* A bag contains 6 red, 7 black and 8 blue balls. What is the probability that two balls drawn simultaneously are one red and one black?

(b) Two dice are thrown. Find the conditional probability that two fives occurs, if it is known that the total is divisible by 5.

★ ★ ★