SRM INSTITUTE OF SCIENCE AND TECHNOLOGY RAMAPURAM CAMPUS DEPARTMENT OF MATHEMATICS SURPRISE TEST – 3

* Required

Answer ALL Questions

Each question carries ONE mark.

1. *

The particular integral of $(D^2 + 2D + 3)y = 7$ is

(A) 0   (B) 3/7   (C) 7/3   (D) 1

○ A

○ B

◉ C

○ D

2. *

The particular integral of $(D^2 + 9)y = e^{3x}$ is

(A) $\dfrac{e^{-3x}}{15}$ (B) $\dfrac{e^{3x}}{18}$ (C) $\dfrac{e^{-3x}}{18}$ (D) $\dfrac{xe^{-3x}}{18}$

○ A

◉ B

○ C

○ D

3. *

The complementary function of $(D^2 + 16)y = \sin 2x$ is

(A) $C_1 e^{-4x} + C_2 xe^{-4x}$ (B) $C_1 e^{4x} + C_2 xe^{4x}$

(C) $C_1 \cos 4x + C_2 \sin 4x$ (D) $(C_1 + C_2 x)e^{3x}$

○ A

○ B

◉ C

○ D

4. *

The complementary function of $(D+1)^2 y = 0$ is

(A) $C_1 e^{-x} + C_2 e^{-x}$ (B) $C_1 e^x + C_2 e^x$

(C) $(C_1 + C_2 x) e^x$ (D) $(C_1 + C_2 x) e^{-x}$

○ A

○ B

○ C

◉ D

5. *

The complementary function of $\dfrac{d^2 y}{dx^2} - 8\dfrac{dy}{dx} + 12y = 0$

(A) $C_1 e^{-5x} + C_2 e^{-3x}$ (B) $C_1 e^{4x} + C_2 e^{4x}$

(C) $C_1 e^{5x} + C_2 e^{3x}$ (D) $C_1 e^{2x} + C_2 e^{6x}$

○ A

○ B

○ C

◉ D

6. *

If the three roots of the auxiliary equation are $-a, -a, a,$ then the complementary function is

(A) $C_1 e^{ax} + C_2 e^{-ax} + C_3 e^{-ax}$

(B) $(C_1 + C_2 x) e^{-ax} + C_3 e^{ax}$

(C) $(C_1 + C_2 x) e^{ax} + c_3$

(D) $(C_1 + C_2 x + C_3 x^2) e^{ax}$

○ A

◉ B

○ C

○ D

7. *

The roots of the auxiliary equation $m^2 - 49 = 0$ are

(A) $7, 7$ (B) $7, -7$ (C) ± 9 (D) $\pm 7i$

◉ A

○ B

○ C

○ D

8. *

The equation $[(ax + b)^2 x^2 D^2 + a_1(ax+b)xD + a_2]y = f(x)$, where a_0, a_1, a_2 are constants is called

(A) Cauchy-Euler's equation　　(B) Legendre's equation
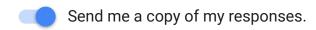
(C) Taylor's equation　　　　　(D) Homogeneous equation

○ A

◉ B

○ C

○ D

9. *

The particular integral of $(D^2 + 1)y = x^2$ is

(A) $(x^2 + 2)$　　　(B) x　　　(C) $(x^2 - 2)$　　　(D) $-x^2$

○ A

○ B

◉ C

○ D

10. *

If the complementary function is $(C_1 + C_2\, x)e^{-3x}$, then the roots are

(A) $3, 3$ (B) $-3, -3$ (C) ± 3 (D) $\pm 3\, i$

○ A

◉ B

○ C

○ D

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