



@COMPUTERENGINEER
RINGDEPARTMENT22

سؤال 7

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the general solution of the differential equation

$$y^{(4)} - 8y^{(3)} + 42y'' - 104y' + 169y = 0$$

$$r^4 - 8r^3 + 42r^2 - 104r + 169 = (r^2 - 4r + 13)^2 : \text{Hint}$$

None of the given answers is true ☐

$$y = c_1 e^{2t} \cos(3t) + c_2 e^{2t} \sin(3t) + c_3 t e^{2t} \cos(3t) + c_4 t e^{2t} \sin(3t) \quad \bullet$$

$$y = c_1 \cos(3t) + c_2 \sin(3t) + c_3 t \cos(3t) + c_4 t \sin(3t) \quad \circ$$

$$y = c_1 e^{2t} + c_2 e^{-2t} + c_3 t e^{2t} + c_4 t e^{-2t} \quad \circ$$

$$y = c_1 e^{-2t} \cos(3t) + c_2 e^{-2t} \sin(3t) + c_3 t e^{-2t} \cos(3t) + c_4 t e^{-2t} \sin(3t) \quad \circ$$

الإجابة الصحيحة هي: $y = c_1 e^{2t} \cos(3t) + c_2 e^{2t} \sin(3t) + c_3 t e^{2t} \cos(3t) + c_4 t e^{2t} \sin(3t)$

سؤال 8

صحيح

درجة 2.0 من 2.0

علم السؤال

Find the solution of the initial value problem

$$y''' - y' = 0, \quad y(0) = 2, \quad y'(0) = 0, \quad y''(0) = -4.$$



$$y = 6 - 2e^t - 2e^{-t} \quad \bullet$$

None of the given answers is true ☐

$$y = 2 + 2e^t - 2e^{-t} \quad \circ$$

$$y = -2 + 2e^t + 2e^{-t} \quad \circ$$

$$y = 2 - 2e^t + 2e^{-t} \quad \circ$$

الإجابة الصحيحة هي: $y = 6 - 2e^t - 2e^{-t}$

سؤال 5

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the general solution of the differential equation

$$y''' - 2y'' + y' - 2y = 0$$

$$y = c_1 + c_2 \cos(t) + c_3 \sin(t) \quad \text{○}$$

$$y = c_1 e^{2t} + c_2 e^t + c_3 e^{-t} \quad \text{○}$$

$$y = c_1 + c_2 e^t + c_3 e^{-t} \quad \text{○}$$

None of the given answers is true ☐

$$y = c_1 e^{2t} + c_2 \cos(t) + c_3 \sin(t) \quad \text{●}$$

الإجابة الصحيحة هي: $y = c_1 e^{2t} + c_2 \cos(t) + c_3 \sin(t)$

سؤال 6

صحيح

درجة 2.0 من 2.0

علم السؤال

Find the general solution of the differential equation

$$3y^{(5)} - 4y^{(4)} - 24y''' + 32y'' + 48y' - 64y = 0$$



$$y = c_1 e^{4t/3} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t} \quad \text{●}$$

None of the given answers is true ☐

$$y = c_1 e^{2t} + (c_2 + c_3 t) e^{4t/3} + (c_4 + c_5 t) e^{-4t/3} \quad \text{○}$$

$$y = c_1 e^{-4t/3} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t} \quad \text{○}$$

$$y = c_1 e^{-2t} + (c_2 + c_3 t) e^{4t/3} + (c_4 + c_5 t) e^{-4t/3} \quad \text{○}$$

الإجابة الصحيحة هي:

$$y = c_1 e^{4t/3} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t}$$

سؤال 3

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the Wronskian of the functions

$$f_1(t) = 2, f_2(t) = t^2, f_3(t) = \cos(t)$$

$W(f_1, f_2, f_3) = 4[\cos(t) - t \sin(t)]$ ☐

$W(f_1, f_2, f_3) = 4[\cos(t) + t \sin(t)]$ ☐



$W(f_1, f_2, f_3) = 4[\sin(t) - t \cos(t)]$ ☒

none of the given answers ☐

$W(f_1, f_2, f_3) = 4[\sin(t) + t \cos(t)]$ ☐

الإجابة الصحيحة هي: $W(f_1, f_2, f_3) = 4[\sin(t) - t \cos(t)]$

سؤال 4

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the Wronskian of the functions

$$f_1(t) = 1, f_2(t) = t, f_3(t) = e^{-4t}, f_4(t) = te^{-4t}$$

None of the given answers ☐



$W(f_1, f_2, f_3, f_4) = 256e^{-8t}$ ☒

$W(f_1, f_2, f_3, f_4) = -256e^{-4t}$ ☐

$W(f_1, f_2, f_3, f_4) = 256e^{-4t}$ ☐

$W(f_1, f_2, f_3, f_4) = -256e^{-8t}$ ☐

الإجابة الصحيحة هي: $W(f_1, f_2, f_3, f_4) = 256e^{-8t}$

سؤال 1

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the largest interval in which the solution of the initial value problem

$$(t + 2)y''' + \cos(t) y'' + 5y = \sin(t),$$

$$y(3) = y'(3) = y''(3) = 1,$$

is certain to exist

$$(-\infty, -2) \quad \text{○}$$

$$(-2, \infty) \quad \text{●}$$

$$(-3, 3) \quad \text{○}$$

none of the given answers ☐

$$(-\infty, \infty) \quad \text{○}$$



الإجابة الصحيحة هي: $(-2, \infty)$

سؤال 2

صحيح

درجة 1.0 من 1.0

علم السؤال

Which of the following sets is a fundamental set of solutions of the linear homogeneous differential equation

$$y^{(4)} - 4y''' = 0$$

$$y_1 = 1, \quad y_2 = 2 - t, \quad y_3 = 2 - t^2, \quad y_4 = 2t^2 \quad \text{○}$$

$$y_1 = 1, \quad y_2 = 2 - t, \quad y_3 = 2 - t^2, \quad y_4 = 2t^3 \quad \text{○}$$

None of the given answers is true ☐

$$y_1 = 1, \quad y_2 = 2 - t, \quad y_3 = 2 - t^2, \quad y_4 = 2t \quad \text{○}$$

$$y_1 = 1, \quad y_2 = 2 - t, \quad y_3 = 2 - t^2, \quad y_4 = 2e^{4t} \quad \text{●}$$

الإجابة الصحيحة هي:

$$y_1 = 1, \quad y_2 = 2 - t, \quad y_3 = 2 - t^2, \quad y_4 = 2e^{4t}$$

Find the solution of the initial value problem

$$y''' - 4y' = 0, \quad y(0) = -2, \quad y'(0) = 0, \quad y''(0) = 8.$$



$y = -4 + e^{2t} + e^{-2t}$ ☒

$y = -2 - e^{2t} + e^{-2t}$ ☐

None of the given answers is true ☐

$y = -2 + e^{2t} - e^{-2t}$ ☐

$y = -e^{2t} - e^{-2t}$ ☐

الإجابة الصحيحة هي: $y = -4 + e^{2t} + e^{-2t}$

سؤال 8

صحيح

درجة 2.0 من 2.0

علم السؤال

Find the general solution of the differential equation $625y^{(4)} - 200y'' + 16y = 0$.
Hint: $626r^4 - 200r^2 + 16 = (25r^2 - 4)^2$



$y = c_1 \cos(2t/5) + c_2 \sin(2t/5) + c_3 t \cos(2t/5) + c_4 t \sin(2t/5)$ ☐

$y = c_1 e^{2t/5} + c_2 e^{-2t/5} + c_3 t e^{2t/5} + c_4 t e^{-2t/5}$ ☒

$y = c_1 e^{2t/5} + c_2 e^{-2t/5} + c_3 \cos(2t/5) + c_4 \sin(2t/5)$ ☐

None of the given answers is true ☐

$y = c_1 e^{2t/5} \cos(2t/5) + c_2 e^{2t/5} \sin(2t/5) + c_3 e^{-2t/5} \cos(2t/5) + c_4 e^{-2t/5} \sin(2t/5)$ ☐

الإجابة الصحيحة هي: $y = c_1 e^{2t/5} + c_2 e^{-2t/5} + c_3 t e^{2t/5} + c_4 t e^{-2t/5}$

سؤال 7

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the general solution of the differential equation $4y^{(5)} - 7y^{(4)} - 32y''' + 56y'' + 64y' - 112y = 0$.



$y = c_1 e^{2t} + (c_2 + c_3 t) e^{7t/4} + (c_4 + c_5 t) e^{-7t/4}$ ☐

$y = c_1 e^{7t/4} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t}$ ☒

$y = c_1 e^{-7t/4} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t}$ ☐

$y = c_1 e^{-2t} + (c_2 + c_3 t) e^{7t/4} + (c_4 + c_5 t) e^{-7t/4}$ ☐

None of the given answers is true ☐

الإجابة الصحيحة هي: $y = c_1 e^{7t/4} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t}$

سؤال 6

صحيح

درجة 2.0 من 2.0

علم السؤال

سؤال 5

صحيح

درجة 1.0 من 1.0

علم السؤال

. $y''' + 2y'' - 9y' - 18y = 0$ Find the general solution of the differential equation

$y = c_1 e^{-2t} + c_2 \cos(3t) + c_3 \sin(3t)$ ☐

$y = c_1 + c_2 \cos(3t) + c_3 \sin(3t)$ ☐

$y = c_1 e^{-2t} + c_2 e^{3t} + c_3 e^{-3t}$ ☒

None of the given answers is true ☐

$y = c_1 + c_2 e^{3t} + c_3 e^{-3t}$ ☐



الإجابة الصحيحة هي: $y = c_1 e^{-2t} + c_2 e^{3t} + c_3 e^{-3t}$

سؤال 4

صحيح

درجة 1.0 من 1.0

علم السؤال

$f_1(t) = 1$, $f_2(t) = t$, $f_3(t) = e^{-t}$, $f_4(t) = e^{-2t}$ Find the Wronskian of the functions

$W(f_1, f_2, f_3, f_4) = 4e^{3t}$ ☐

None of the given answers ☐

$W(f_1, f_2, f_3, f_4) = -4e^{-3t}$ ☒

$W(f_1, f_2, f_3, f_4) = -4e^{3t}$ ☐

$W(f_1, f_2, f_3, f_4) = 4e^{-3t}$ ☐



الإجابة الصحيحة هي: $W(f_1, f_2, f_3, f_4) = -4e^{-3t}$

سؤال 3

صحيح

درجة 1.0 من 1.0

علم السؤال

$f_1(t) = 2$, $f_2(t) = t^3$, $f_3(t) = \sin(t)$ Find the Wronskian of the functions

$W(f_1, f_2, f_3) = -6t[2 \cos(t) + t \sin(t)]$ ☒

none of the given answers ☐

$W(f_1, f_2, f_3) = -6t[2 \sin(t) + t \cos(t)]$ ☐

$W(f_1, f_2, f_3) = 6t[2 \cos(t) + t \sin(t)]$ ☐

$W(f_1, f_2, f_3) = 6t[2 \sin(t) + t \cos(t)]$ ☐



الإجابة الصحيحة هي: $W(f_1, f_2, f_3) = -6t[2 \cos(t) + t \sin(t)]$

سؤال 2

صحيح

درجة 1.0 من 1.0

علم السؤال

Which of the following sets is a fundamental set of solutions of the linear homogeneous differential equation

. $y^{(4)} + 2y''' = 0$

$y_1 = 1$, $y_2 = 1 + t$, $y_3 = 1 - t^2$, $y_4 = -3e^{-2t}$ ☒

None of the given answers is true ☐

$y_1 = 1$, $y_2 = 1 + t$, $y_3 = 1 - t^2$, $y_4 = -3t^2$ ☐

$y_1 = 1$, $y_2 = 1 + t$, $y_3 = 1 - t^2$, $y_4 = -3t^3$ ☐

$y_1 = 1$, $y_2 = 1 + t$, $y_3 = 1 - t^2$, $y_4 = -3t$ ☐



الإجابة الصحيحة هي: $y_1 = 1$, $y_2 = 1 + t$, $y_3 = 1 - t^2$, $y_4 = -3e^{-2t}$

سؤال 1

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the largest interval in which the solution of the initial value problem

$$(t-2)y''' + \cos(2t)y'' + 5y = \sin(2t),$$

$$y(0) = y'(0) = y''(0) = 1,$$

.is certain to exist

☐ $(-\infty, \infty)$
☐ $(2, \infty)$
☐ $(0, 1)$
☒ $(-\infty, 2)$
☐ none of the given answers
الإجابة الصحيحة هي: $(-\infty, 2)$

سؤال 1

صحيح

درجة 1.0 من 1.0

علم السؤال

Find the largest interval in which the solution of the initial value problem

$$(t+1)y''' + \cos(2t)y'' + 5y = \sin(2t),$$

$$y(-3) = y'(-3) = y''(-3) = 1,$$

.is certain to exist

☐ none of the given answers

☐ $(-1, \infty)$
☐ $(-3, 3)$
☒ $(-\infty, -1)$
☐ $(-\infty, \infty)$
الإجابة الصحيحة هي: $(-\infty, -1)$

سؤال 2

صحيح

درجة 1.0 من 1.0

علم السؤال

Which of the following sets is a fundamental set of solutions of the linear homogeneous differential equation

$$y^{(4)} - 4y'' = 0$$

☐ $y_1 = t, \quad y_2 = e^{2t}, \quad y_3 = e^{-2t}, \quad y_4 = t + e^{-2t}$

☐ $y_1 = 1, \quad y_2 = 1 + t, \quad y_3 = t, \quad y_4 = 3e^{-2t}$

☐ $y_1 = t, \quad y_2 = e^{2t}, \quad y_3 = e^{-2t}, \quad y_4 = t + e^{2t}$

☐ None of the given answers is true

☒ $y_1 = 1, \quad y_2 = 1 + t, \quad y_3 = 2e^{2t}, \quad y_4 = 3e^{-2t}$

الإجابة الصحيحة هي: $y_1 = 1, \quad y_2 = 1 + t, \quad y_3 = 2e^{2t}, \quad y_4 = 3e^{-2t}$

$f_1(t) = 4, f_2(t) = t^3, f_3(t) = \sin(t)$ Find the Wronskian of the functions

☒ $W(f_1, f_2, f_3) = -12t[2 \cos(t) + t \sin(t)]$

☐ $W(f_1, f_2, f_3) = -12t[2 \sin(t) + t \cos(t)]$

☐ $W(f_1, f_2, f_3) = 12t[2 \cos(t) + t \sin(t)]$

☐ none of the given answers

☐ $W(f_1, f_2, f_3) = 12t[2 \sin(t) + t \cos(t)]$

سؤال 3

صحيح

درجة 1.0 من 1.0

علم السؤال

الإجابة الصحيحة هي: $W(f_1, f_2, f_3) = -12t[2 \cos(t) + t \sin(t)]$

$f_1(t) = \frac{1}{2}, f_2(t) = t, f_3(t) = e^t, f_4(t) = e^{4t}$ Find the Wronskian of the functions

☐ $W(f_1, f_2, f_3, f_4) = 24e^{-5t}$

☐ None of the given answers

☐ $W(f_1, f_2, f_3, f_4) = -24e^{-5t}$

☒ $W(f_1, f_2, f_3, f_4) = 24e^{5t}$

☐ $W(f_1, f_2, f_3, f_4) = -24e^{5t}$

سؤال 4

صحيح

درجة 1.0 من 1.0

علم السؤال

الإجابة الصحيحة هي: $W(f_1, f_2, f_3, f_4) = 24e^{5t}$

$y''' + y'' + 4y' + 4y = 0$ Find the general solution of the differential equation

☐ $y = c_1 e^t + c_2 e^{-t} + c_3 t e^{-t}$

☐ $y = c_1 + c_2 \cos(2t) + c_3 \sin(2t)$

☐ None of the given answers is true

☒ $y = c_1 e^{-t} + c_2 \cos(2t) + c_3 \sin(2t)$

☐ $y = c_1 + c_2 e^{2t} + c_3 e^{-2t}$

سؤال 5

صحيح

درجة 1.0 من 1.0

علم السؤال

الإجابة الصحيحة هي: $y = c_1 e^{-t} + c_2 \cos(2t) + c_3 \sin(2t)$

$4y^{(5)} - y^{(4)} - 32y''' + 8y'' + 64y' - 16y = 0$ Find the general solution of the differential equation

☒ $y = c_1 e^{t/4} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t}$

☐ $y = c_1 e^{2t} + (c_2 + c_3 t) e^{t/4} + (c_4 + c_5 t) e^{-t/4}$

☐ None of the given answers is true

☐ $y = c_1 e^{-2t} + (c_2 + c_3 t) e^{t/4} + (c_4 + c_5 t) e^{-t/4}$

☐ $y = c_1 e^{-t/4} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t}$

سؤال 6

صحيح

درجة 2.0 من 2.0

علم السؤال

الإجابة الصحيحة هي: $y = c_1 e^{t/4} + (c_2 + c_3 t) e^{2t} + (c_4 + c_5 t) e^{-2t}$

سؤال 7

صحيح

درجة 1.0 من 1.0

علم السؤال

. $y^{(4)} - 4y^{(3)} + 14y'' - 20y' + 25y = 0$ Find the general solution of the differential equation
 $r^4 - 4r^3 + 14r^2 - 20r + 25 = (r^2 - 2r + 5)^2$:Hint



$$y = c_1 e^{-t} \cos(2t) + c_2 e^{-t} \sin(2t) + c_3 t e^{-t} \cos(2t) + c_4 t e^{-t} \sin(2t) \quad \text{○}$$

$$y = c_1 e^t \cos(2t) + c_2 e^t \sin(2t) + c_3 t e^t \cos(2t) + c_4 t e^t \sin(2t) \quad \text{●}$$

None of the given answers is true ○

$$y = c_1 \cos(2t) + c_2 \sin(2t) + c_3 t \cos(2t) + c_4 t \sin(2t) \quad \text{○}$$

$$y = c_1 e^t + c_2 e^{-t} + c_3 t e^t + c_4 t e^{-t} \quad \text{○}$$

الإجابة الصحيحة هي: $y = c_1 e^t \cos(2t) + c_2 e^t \sin(2t) + c_3 t e^t \cos(2t) + c_4 t e^t \sin(2t)$

سؤال 8

صحيح

درجة 2.0 من 2.0

علم السؤال

Find the solution of the initial value problem

$$y''' - y' = 0, \quad y(0) = -1, \quad y'(0) = 0, \quad y''(0) = 4.$$



$$y = 3 - 2e^t - 2e^{-t} \quad \text{○}$$

$$y = -1 - 2e^t + 2e^{-t} \quad \text{○}$$

$$y = -1 + 2e^t - 2e^{-t} \quad \text{○}$$

None of the given answers is true ○

$$y = -5 + 2e^t + 2e^{-t} \quad \text{●}$$

الإجابة الصحيحة هي: $y = -5 + 2e^t + 2e^{-t}$