Started on	Thursday, 21 December 2023, 11:30 AM
State	Finished
Completed on	Thursday, 21 December 2023, 11:59 AM
Time taken	29 mins 5 secs
Grade	**12.00** out of 12.00 (**100**%)

Question **1**

Correct

Mark 2.00 out of 2.00

If the differential equation

$$\left(g(x)y^3 - \frac{1}{1+9x^2}\right)dx + 4x^3y^2dy = 0$$

is $exact$, then $g(4) =$

Select one:

- 59
- 65
- 64 ✔
- 67

The correct answer is: 64

Question **2**

Correct

Mark 2.00 out of 2.00

Consider the IVP $y' = 2t + y$, $y(0) = 0$. Using **Picard'd method**

Select one:

- $\phi_2(t) = \frac{t^2}{2} + \frac{t^3}{3}$
- $\phi_2(t) = \frac{t^2}{2} + \frac{t^3}{3!}$
- $\phi_2(t) = t^2 + \frac{t^3}{3!}$
- $\phi_2(t) = t^2 + \frac{t^3}{3}$ ✔

The correct answer is: $\phi_2(t) = t^2 + \frac{t^3}{3}$

Question **3**

Correct

Mark 2.00 out of 2.00

An **integrating factor** that makes the differential equation

$$2ye^x dx + (y + e^x)dy = 0$$

exact is

Select one:

- $\frac{1}{\sqrt{y}}$ ✔
- e^x
- e^y
- $\sqrt{y}$

The correct answer is: $\frac{1}{\sqrt{y}}$

Question **4**

Correct

Mark 2.00 out of 2.00

The general solution of the differential equation $yy'' = -225(y')^2$ is

Select one:

- $y(t)^{231} = 231(c_1 t + c_2)$
- $y(t)^{220} = 220(c_1 t + c_2)$
- $y(t)^{228} = 228(c_1 t + c_2)$
- $y(t)^{226} = 226(c_1 t + c_2)$ ✔

The correct answer is: $y(t)^{226} = 226(c_1 t + c_2)$

Question **5**

Correct

Mark 2.00 out of 2.00

The general solution of the differential equation $3y'' = 5y'$ is

Select one:

- $y(t) = c_1 e^{(\frac{6}{3} t)} + c_2$
- $y(t) = c_1 e^{(\frac{2}{3} t)} + c_2$
- $y(t) = c_1 e^{(\frac{10}{3} t)} + c_2$
- $y(t) = c_1 e^{(\frac{5}{3} t)} + c_2$ ✔

The correct answer is: $y(t) = c_1 e^{(\frac{5}{3} t)} + c_2$

Question 6

Correct

Mark 2.00 out of 2.00

The initial value problem $y' = t - y^3, y(7) = 6$ is equivalent to the following initial value problem at the origin.

Select one:

- $z' = \tau + 8 - (z+6)^3, z(0) = 0$
- $z' = \tau + 8 - (z+7)^3, z(0) = 0$
- $z' = \tau + 7 - (z+7)^3, z(0) = 0$
- $z' = \tau + 7 - (z+6)^3, z(0) = 0$ ✔

The correct answer is: $z' = \tau + 7 - (z+6)^3, z(0) = 0$