



12 Pages

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1	Student Number	104 870
2	Title of Examination Paper	TC2
3	Module Code	PCEE 4000
4	Date and Time of Examination	9:15 22/5/19
5	Examination Venue	Pembrokeshire College
6	Seat Number	

7	Number of Answer Books handed in	
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[illegible]

Second Mark 50/22

(Gweler yr ochr arall am y fersiwn Cymraeg)

FOLD → Complete section, remove strip, fold as indicated and SEAL

Please complete this section and SEAL before the examination starts.

Surname

(Block Capitals) Forename(s) SHAUN MICHAEL

PULL & TEAR

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$$2) 2(7 - 3e^{-0.5t})$$

$$= 14 - 6e^{-0.5t}$$

$$\frac{dv}{dt} = 6 \times 0.5e^{-0.5t}$$

$$= 3e^{0.5t \times 0} \quad t=0$$

$$= 3 \text{ v/s}$$

8

$$4) \frac{5x-6}{4x(x-2)} = \frac{A}{4x} + \frac{B}{(x-2)} = \frac{A(x-2) + B(4x)}{4x(x-2)}$$

$$= 5x - 6 = A(x-2) + B(4x)$$

$$x=0 \quad 5 \times 0 - 6 = A(0-2) + B(4 \times 0)$$

$$-6 = A(-2) + B(0)$$

$$-6 = A(-2)$$

$$A = -6/-2 = 3$$

$$x=2 \quad 5 \times 2 - 6 = A(2-2) + B(4 \times 2)$$

$$4 = A(0) + B(8)$$

$$4 = B(8)$$

$$B = 4/8 = 1/2$$

$$\left[\int \frac{3}{4x} + \frac{1}{2(x-2)} dx \right]_3^4$$

$$dx = \left[\frac{3}{4x} + \frac{1}{2x(x-2)} \right]_3^4$$

✓
50P

$$x = 4 \left[\frac{3}{4} \ln(4x4) + \frac{1}{2} \ln(x - \frac{2}{4}) \right]_3^4$$

$$= 2.4261 \quad \text{rounding error}$$

$$x = 3 \left[\frac{3}{4} \ln(4x3) + \frac{1}{2} \ln(x - 2) \right]_3^4$$

$$= 1.8637 \quad \checkmark$$

$$2.4261 - 1.8637 = 0.5624 \quad \checkmark$$

(17)

$$51 \quad \frac{4-3}{4} = 1/4 = 0.25$$

x	3	3.25	3.5	3.75	4
y	3/4	41/65	23/42	17/35	7/16
	y ₀	y ₁	y ₂	y ₃	y _n

Simpsons rule

$$\frac{1}{3} \times 0.25 \left(\frac{3}{4} + \frac{7}{16} + 4 \left(\frac{41}{65} + \frac{17}{35} \right) + 2 \left(\frac{23}{42} \right) \right) = 0.5624 \quad \checkmark$$

$$\text{percentage error} = \frac{0.5624 - 0.5624}{0.5624} \times 100$$

$$\text{correct with previous error} = 0\% \text{ error} \quad \checkmark$$

(14)

6)	mid p	5	15	25	35	45	✓	Totals
	freq	2	10	17	8	3		= 40
	fx	10	150	425	280	135	✓	= 1000
	$f(x-\bar{x})^2$	800	1000	0	800	1200	✓	= 3800

$$\bar{x} = \frac{1000}{40} = 25 \quad s = \sqrt{\frac{3800}{40-1}} = 9.87$$

7) series

14

$$P(A) = 0.75 \quad P(B) = 0.82 \\ = 0.75 \times 0.82 = 0.615 \quad \checkmark$$

parallel

$$P(\bar{A}) = 1 - 0.75 = 0.25$$

$$P(\bar{B}) = 1 - 0.82 = 0.18$$

$$\text{no connection} = 0.25 \times 0.18 = 0.045 \quad \checkmark$$

$$\text{connection} = 1 - 0.045 = 0.96 \quad \checkmark$$

8

✓
sdp

$$3.11 \int_1^3 (5 - 4x + 4x^3) dx$$

$$\int_1^3 \left(\frac{5 \cancel{0+1}}{\cancel{0+1}} - \frac{4x^{\cancel{1+1}}}{\cancel{1+1}} + \frac{4x^{\cancel{3+1}}}{\cancel{3+1}} \right) dx \quad \text{don't cancel!}$$

$$= \left[5 - 4x + 4x \right]_1^3$$

$$x=3 \quad \left[5 - 4 \times 3 + 4 \times 3 \right] = 5$$

$$x=1 \quad \left[5 - 4 \times 1 + 4 \times 1 \right] = 5 \quad \times \text{ (0)}$$

$$5 - 5 = 0 \text{ units}^2$$

✓
SDP