

Due Date: 1st class week 10 = Tuesday 11 October

ID Number .....

Show all working, neatly! Give answers correct to 3 decimal places.

Student declaration: I confirm that this is an original assessment and is entirely my own work.

Signature ..... Date ..... Total /24

1 The average value of a complex voltage waveform is given by:

$$V_{AV} = \frac{1}{\pi} \int_0^{\pi} (5\sin\omega t + 2\sin 3\omega t + \sin 5\omega t) d(\omega t). \text{ Evaluate } V_{AV} .$$

2 Determine:  $\int 7\cos^3 t \cdot \sin t dt$

(3 marks)

(3 marks)

- 3 The time taken,  $t$  hours, for a vehicle to reach a velocity of 80 km/h with an initial speed of 40 km/h is given by:

$$t = \int_{40}^{80} \frac{dv}{600 - 4v}$$

Where  $v$  is the velocity in km/h. determine  $t$  in minutes.

(3 marks)

- 4 Determine:  $\int 4\cos^3 2t \, dt$

(3 marks)

5 Determine:

$$-2 \int_0^{\pi/3} \sin 4\theta \sin 2\theta \, d\theta$$

(3 marks)

6 Determine:

$$\int \frac{4}{9 + t^2} \, dt$$

(4 marks)

7 Determine:

$$\int_2^5 \sqrt{x^5} \ln x \, dx$$

(5 marks)