5.1 Integration

Question Paper

Course	Edexcel IAL Maths: Pure 1
Section	5. Integration
Topic	5.1 Integration
Difficulty	V. Hard

Time allowed: **30**

Score: **/25**

Percentage: **/100**

Question 1

Use calculus to find

$$\int \left(2\sqrt{x} + 5x^{\frac{1}{3}}\right) \mathrm{d}x$$

[3 marks]

Question 2

Use calculus to work out the following integrals:

(a)

$$\int \left(3x - \frac{\sqrt{4x} + 5x^4}{x}\right) \mathrm{d}x$$

[3 marks]

Question 2

(b)

$$\int \left(\frac{3x}{\sqrt{x}} + (2x+1)^2\right) \mathrm{d}x$$

[3 marks]

Question 3

Find the equation of the curve passing through the point (4, -8) and given by

$$y = \int \left(\frac{2}{\sqrt{x}} - x - 3\right) \mathrm{d}x$$

[4 marks]

Question 4

(a) Show that

$$\left(3 - \frac{1}{2}x\right)^3 = 27 - \frac{27}{2}x + \frac{9}{4}x^2 - \frac{1}{8}x^3$$

[3 marks]

Question 4

(b) Hence, or otherwise, work out

$$\int \left(2\left(3-\frac{1}{2}x\right)\right)^3 \, \mathrm{d}x$$

[3 marks]

Question 5

A function, $\mathrm{f}(x)$, has second derivative given by

$$\mathrm{f}''(x) = 2(18x - 5).$$

Given that $(2x - 1)$ and $(3x + 2)$ are factors of $\mathrm{f}(x)$, find $\mathrm{f}(x)$.

[6 marks]