

Question Number	I	II	III	Total
Mark				
Student's Name	Student's ID		Section's number	

ملاحظة: لا يسمح بالإجابة بالقلم الرصاص

**Question I:** Choose the correct answer:

- $\sum_{i=1}^{50} (2 - i)$  equals  
 a) -25                      b) 1275                      c) -1175                      d) 50
- An antiderivative of  $f(x) = 3x^2 + 4x$  is  
 a)  $6x + 4$                       b)  $x^3 + 2x^2$                       c)  $3x^2 + 4x + 5$                       d) None of the previous.
- If  $\int_1^5 f(x)dx = -6$ ,  $\int_2^5 3f(x)dx = 6$ , then  $\int_2^1 f(x)dx$  is  
 a) 0                      b) -4                      c) 8                      d) 4
- If  $f(x) = \int_3^x (3t^2 - 20)^2 dt$ , then  $f'(3)$  equals:  
 a) 0                      b) 49                      c) -33                      d) 539

**Question II:** a) Find the value of the integrals:

i)  $\int_1^2 \frac{x}{\sqrt{x^2+4}} dx$

ii)  $\int_0^3 |x - 1| dx$

a) Find the value of **c** that satisfies the Integral Mean Value theorem for  $f(x) = 3x^2 - 2$  on  $[-2,2]$ .

**Question III:** a) Without calculating the integrals show that  $\int_1^5 (x^2 - 1)dx \geq \int_1^5 (x - 1)dx$ .

b) Evaluate the indefinite integrals :

i)  $\int (\sin^2 x + \sin 2x + \cos^2 x)^{\frac{1}{2}} dx$  . (Hint: use  $\sin 2x = 2 \sin x \cos x$  )

ii)  $\int \left( \frac{8}{x^3} - 10 \sec^2 x \right) dx.$

iii)

- a) Sketch the region under the graph  $x^2$  on  $[2,5]$
- b) Use Riemann sum to evaluate the area of this region

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