HADHRAMOUT UNIVERSITY
COLLEGE OF ENGINEERING & PETROLEUM

Department: All
Academic Year: 2020 – 2021
Exam Semester: Second
Examiner: Salman Ba-Rashed **&** Mohammed Saleh Bafgeh

Date: --- / --- / 2021
Subject: Integral Calculus
Level: The first Level
Time Allowed: 2:30 h

Answer all the following questions

Question 1: (30 marks) (15 +15)

(a) *Choose the correct answer in the following*

$1-$ *If* $\int_0^2 g(x)\,dx = 4$ *, then* $\int_2^0 g(x)\,dx =$

$a)$ *Zero* , $b)\ 4$, $c)-4$, $d)$ *non of the above*

$2-\int \frac{x}{4-9x^2}\,dx =$

$a)-\frac{1}{18}\ln|4-9x^2|+c$, $b)\ -18\ln|4-9x^2|+c$, $c)\ln|4-9x^2|+c$, $d)\frac{1}{6}\tanh^{-1}(\frac{3}{2}x^2)+c$

$3-\int_3^3 e^{\sin x}\,dx =$ ……

$a)-1$, $b)$ *zero* , $c)\ \pi$, $d)\ 2$

(b)*Evaluate the following*

1) $\int(6x^2+2x-7)dx$ 2) $\int(5x^3+2\sec x)dx$

Question 2: (30 marks)(12 + 8 +10)

(a) *Stat true or fouls* :

1. $\int(-3x+1)^4dx=\frac{(-3x+1)^5}{-12}+c$ ( )

2. $\coth(-2x)=\frac{e^{-2x}-e^{2x}}{e^{2x}+e^{-2x}}$ ( )

3. $\int\frac{g'(x)}{\sqrt{b^2(g(x)^2-a^2}}dx=\frac{1}{b}\cosh^{-1}\left(\frac{b}{a}g(x)\right)+c$ ( )

4. $\sum_{i=1}^7 i=28$ ( )

(b) *Find the lower and upper bound of* $\int_1^2(2x+7)$

(c)*Find the number C that satisfies the mean value theorem for the foliowing integral*

$$\int_1^3(x-2)^3dx$$

Question 3: (20 marks)(7+13)

(a)*Solve the following initial value problem*

$$f'(x) = 6x^2 + x - 5 \quad s.t \ f(1) = 2$$

(b) *Evaluate the following inegrals*

1) $\int \frac{x^2 + 10x + 6}{x^2 + 2x - 8} dx$ 2) $\int x \ln 5x \, dx$

Question 4: (20marks)(7+13)

(a)*Use the* ***Definition of definite integral*** *to find* $\int_0^3 (x^2 - 2)dx$

(b) *Evaluate the following inegrals*

1) $\int \cosh x \sqrt{(\sinh x)^2} \, dx$ 2) $\int_2^4 \frac{2x + 4}{x^2 + 4x + 9} dx$

Good luck