UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(ONLINE)
SEMESTER II
SESSION 2019/2020

COURSE NAME	:	ENGINEERING MATHEMATICS I
COURSE CODE	:	BDA 14003
PROGRAMME CODE	:	BDD
EXAMINATION DATE	:	JULY 2020
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **FIVE (5)** QUESTIONS **ONLY**

TERBUKA

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1   (a)   Solve the domain and range of the following functions:

(i) $f(x) = \dfrac{2}{\sqrt{9 - x^2}}$

(5 marks)

(ii) $g(x) = \dfrac{50x}{x^2 - 3x - 4}$

(5 marks)

(b)   Examine the limit for the functions of :

(i) $\lim\limits_{x \to \infty} 4x^7 - 18x^3 + 9$

(4 marks)

(ii) $\lim\limits_{x \to -3} \dfrac{\sqrt{2x + 22} - 4}{x + 3}$

(6 marks)

Q2   (a)   Calculate the derivative of this function $y = \dfrac{1 + 10x^2}{\ln x}$ by using Quotient Rule

(5 marks)

(b)   Examine the derivative function of $4x^2 y^7 - 2x = x^5 + 4y^3$ using Implicit Differentiation method

(7 marks)

(c)   Find this limit $\lim\limits_{x \to 0} \dfrac{1 - \cos x}{x^2}$ using appropriate method

(8 marks)

Q3   (a)   Identify the integration of $\int_0^2 x(x^2 + 1)^3 dx$

(6 marks)

(b)   Calculate the integrals of $\int \sin x \ln(\cos x) dx$

(8 marks)

(c)   Examine the integral by using partial fraction method $\int \dfrac{x - 9}{x^2 + 3x - 10} dx$

(6 marks)

Q4   (a)   Solve the arc length, L of the graph $y = x^{\frac{3}{2}}$ from (1,1) to (2, √2)

(10 marks)

(b)   Examine the area of the region enclosed by $x - y^2$ and $y = x - 2$

(10 marks)

Q5   (a)   Let the function as $f(x) = \frac{x^2 - 16}{|x-4|}$

(i)   Find $\lim\limits_{x \to 4^+} f(x)$

(5 marks)

(ii)   Find $\lim\limits_{x \to 4^-} f(x)$

(5 marks)

(iii)   Does $\lim\limits_{x \to 4} f(x)$ exits?

(3 marks)

(b)   Evaluate the limit of $\lim\limits_{x \to 1} \frac{\sqrt{2-x} - x}{x-1}$ by using L'Hospital's Rule

(7 marks)

Q6   (a)   Solve the integral $\int \frac{x}{\sqrt{x^2 - 8}} dx$ by using trigonometry substitution method

(10 marks)

(b)   Evaluate the volume of the solid that is obtained when the region under the curve $y = x^2$ over the interval [0, 3] is revolved at about 90°, 180°, 270° and 360° of the x-axis

(10 marks)

-END OF QUESTION–