UNIRAZAK
UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION

MARCH 2022(Set 1)

COURSE TITLE	MATHEMATICS FOR SOCIAL SCIENCE
COURSE CODE	RMAT2223
DATE/DAY TIME/DURATION	

INSTRUCTIONS TO CANDIDATES:

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of **4** Printed Pages including front page)

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

There are FIVE(5) questions. Answer all the questions.

(55 MARKS)

1.
    a. Express $f(x) = 2x^2 + 6x - 8$ in the form $f(x) = (x+p)^2 + q$ (4 MARKS)

    b. The function $h(x) = \lg(x+2)$ and $k(x) = 5 + \sqrt{x-1}$

        (i)   Find $hk(10)$ (3 MARKS)

        (ii)   Find k^{-1} (6 MARKS)

                                                      (13 MARKS)

2.   It is given that $2x - 1$ is a factor of the expression $4x^3 + ax^2 - 11x + b$ and the remainder when the expression is divided by x+ 2 is 25.Find value of a and b.   (10 MARKS)

3.   The points A(2,11),B(-2,3) and C(2,-1) are vertices of a triangle
    a. Find the equation of the perpendicular bisector of AB   (5 MARKS)

    b. The line through A parallel to BC intersects the perpendicular bisector AB at the point
       D. Find the coordinates of D.   (5 MARKS)

                                                      (10 MARKS)

4.   Express in partial fraction $\dfrac{x^2-5x+6}{(x+1)(x-1)^2}$ (10 MARKS)

5. a. Two variables x and y are related by the equation $y = 6x^2 + \dfrac{32}{x^3}$,obtain the expression for $\dfrac{dy}{dx}$.   (5 MARKS)

    b. Given the curve has a equation $y = x^2 + 64\sqrt{x}$, find the coordinates of the point on the curve where $\dfrac{d^2y}{dx^2} = 0$.   (7 MARKS)

                                                      (12 MARKS)

*** END OF QUESTION PAPER ***

List of Formulas

Differentiation
Product Rule

$$\frac{dy}{dx} = u\,\frac{dv}{dx} + v\,\frac{du}{dx}$$

Quotient Rule

$$\frac{dy}{dx} = \frac{v\,\dfrac{du}{dx} - u\,\dfrac{dv}{dx}}{v^2}$$