BRIDGING EXEMPTION TEST
SEMESTER I, SESSION 2020/2021

COURSE	:	BUSINESS MATHEMATICS
PROGRAMME	:	FACULTY FOUNDATION UTM (BRIDGING)
DURATION	:	2 HOURS
DATE	:	OCTOBER 2020

INSTRUCTIONS TO CANDIDATE:

1. Answer all the questions.
2. All answers must be written in the answer booklet provided. Use a new page for each question.
3. The full marks for each question or section are shown in the bracket at the end of the question.
4. All steps must be shown clearly.
5. Only non-programmable and non-graphing scientific calculators can be used.
6. Answers may be given in the form of π, e, surd, fractions, or up to four significant figures, where appropriate, unless stated otherwise in the question.
7. You are not permitted to take the exam paper and the answer booklet(s) out of the exam hall.

PART A (10 MARKS)

1. Which of the following is not equivalent to $\frac{4}{7}$.

    A. $\frac{28}{49}$ B. $\frac{40}{70}$ C. $\frac{24}{56}$ D. $\frac{68}{119}$

2. $6\frac{1}{2} - 2\frac{2}{5} =$

    A. $(6 - 2) - \left(\frac{1}{2} - \frac{2}{5}\right)$ B. $(6 - 2) + \left(\frac{1}{2} - \frac{2}{5}\right)$

    C. $(6 - 2) + \left(\frac{1}{2} + \frac{2}{5}\right)$ D. $(6 \times 2) - \left(\frac{1}{2} \times \frac{2}{5}\right)$

3. In class of 48 students, $\frac{1}{3}$ of them walk to school. Another $\frac{1}{4}$ come by bus and the rest by motorcycle. Calculate how many of them go to school by motorcycle.

    A. 16   B. 18   C. 20   D. 24

4. Cinema P can seat 400 people when full. Calculate the number of people when the cinema is $\frac{5}{8}$ full.

    A. 200   B. 250   C. 300   D. 320

5. Ramli has 240 rambutans. He gave away 70 to Bidin and 80 to Dollah. What fraction of rambutans does he have left?

    A. $\frac{3}{8}$ B. $\frac{1}{3}$ C. $\frac{3}{4}$ D. $\frac{5}{8}$

6. $16 - 2 \div \frac{1}{7} =$

    A. 98   B. $15\frac{5}{7}$ C. $13\frac{6}{7}$ D. 2

7. Given that $4 - 3(n - 4) = 5n$, then $n =$

    A. -2 B. 1   C. 2   D. $5\frac{1}{3}$

8. Given that $x - 9 = -1\dfrac{1}{4}$, then $x =$

      A. $1\dfrac{2}{9}$ B. $-7\dfrac{3}{4}$ C. $11\dfrac{1}{4}$ D. $7\dfrac{3}{4}$

9. In 2003, there was 2700 students in a certain high school. In 2004, the number of students had decreased to 2160. Determine the percentage of decrease of the students.

      A. 80%   B. 20%   C. 75%   D. 25%

10. By selling a television set at 10000, Chong Bee makes a profit of 25%. Calculate the cost price of the television.

      A. 800   B. 1250   C. 750   D. 250

PART B (40 MARKS)

1. Find the inverse of the matrix

$$\begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 4 \\ 5 & 6 & 0 \end{pmatrix}.$$

(4 marks)

2. A sports bike company found that the demand of their bike is given as

$$Q = 70,000 - 2P,$$

where P is the price of the bike and Q is the quantity sold. The fixed cost of manufacturing the bike is $700,000 while the variable cost is $110 per bike.

   (a) Find the profit function for the bike.

(3 marks)

   (b) Determine the price that maximizes profit.

(3 marks)

3. Differentiate the following functions.

   (a) $f(x) = x^{-2}(4 + 3x^{-2})$

(3 marks)

   (b) $f(x) = \dfrac{4x^3 - 7x}{5x^2 - 2}$

(3 marks)

4. The marketing manager of an IT company conducted a market survey for the company's new smart camera. He found that the cost of producing the smart camera is given approximately by the following equation

$$C = 5x^2 + 15x + 200.$$

   (a) What is the definition of marginal cost?

(1 mark)

   (b) Determine the marginal cost using differentiation.

(3 marks)

5. XYZ Company Ltd plans to purchase a new machine. The machine currently sells for $2 Million, but the price is expected to increase at 6% per year compounded semi-annualy.

   (a) What would be the price of the machine at the end of the fifth year?

   (2 marks)

   (b) The company decides to set up a sinking fund to purchase the machine in 5 years. Find the amount of each quarter payment into the fund if quarterly payments are made and the money is expected to earn 4% compounded quarterly.

   (2 marks)

6. Sue is retiring in 10 years and she believes she will live for another 25 years after retirement. Sue wanted a payment of $1500 at the end of each month for 25 years. The best financial institution is offering a return of 4% compounded monthly. Find the monthly amount that Sue must keep now in order to realise her retirement plan.

   (6 marks)

7. What is the difference between markup based on selling price and markup based on cost? Provide an appropriate example.

   (4 marks)

8. PQR Company Ltd. put a markup of 35% cost on their skincare. They paid $50 per bottle of skincare.

   (a) What is the selling price per bottle of skincare?

   (3 marks)

   (b) Due to the great demand for their product, the company decides to markup another 5% on top of their selling price. Find the new selling price and the total markup.

   (3 marks)