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UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION

JULY 2023

COURSE TITLE	**INTRODUCTION TO BUSINESS MATHEMATICS**
COURSE CODE	**RMAT1113**
DATE/DAY	**14 OCTOBER 2023 / SATURDAY**
TIME/DURATION	**05:00 PM - 07:00 PM / 02 Hour(s) 00 Minute(s)**

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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 5 Printed Pages including front page)

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

There are SEVEN (7) questions in this section. Answer ALL questions in the answer booklet provided. **[100 marks]**

1. A high-rise building has 50 floors. A cleaning company charges RM100 to clean the first floor and an extra RM50 for each floor above the preceding floor.

   a) Find the cleaning cost for twenty-fifth floor. (7 marks)

   b) Find the cleaning cost of the whole building. (8 marks)

2. Four years ago, Khadijah deposited RM8 800 in an account that gave 5% simple interest per annum. Find

   a) the total interest earned. (5 marks)

   b) the total accumulated amount today. (10 marks)

3. For each of the following:

   a) Find the future value of RM4 000 invested for 20 months at 10% compounded monthly. (7 marks)

   b) Find the sum to be invested now at 6% compounded monthly so as to accumulate RM9 888 in two years. (8 marks)

4. RM300 was saved every month for five years in an account that pays 10% compounded monthly. Find the accumulated values if the interest rate was changed to 8% compounded monthly after 1 year. (15 marks)

5. An invoice dated 10th May 2022 for RM10 200 inclusive of handling charges of RM270 was offered trade discounts of 10% and 5% and cash discount terms of 8/10,3/20 and n/30. Find:

   a) the net price after trade discount. (5 marks)

   b) the amount paid on 23rd May 2022. (5 marks)

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6. A retailer buys a sofa set for RM800.Operating expenses incurred during the sale of these sofa set are 20% of the cost price. If the retailer makes a 15% net profit based on the cost. Find

   a) the retail price. (4 marks)

   b) the gross profit. (3 marks)

   c) the net profit. (3 marks)

   d) the breakeven price. (4 marks)

   e) the maximum markdown that could be offered to customers so that there is no profit or loss. (6 marks)

7. Given

   a) CIMB discounts a RM9 000 note due in three months, using a bank discount rate of 10%. Find the equivalent simple interest rate charged by the bank. (5 marks)

   b) Mimie bought a refrigerator set with cash price of RM8 000.He paid a 10% down payment and the balance was settled by making 24 monthly payments. If the interest was 10% per annum on the original balance. Find

      i. the instalment price of the television. (2 marks)

      ii. the monthly payment. (3 marks)

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***** END OF QUESTION PAPER *****

List of Formulas

Sequence

$T_n = a + (n-1)d$

$S_n = \frac{n}{2}[2a + (n-1)d]$

$T_n = ar^{n-1}$

$S_n = \frac{a(r^n-1)}{r-1}, r > 1, S_n = \frac{a(1-r^n)}{1-r}, r < 1$

Simple Interest

$S = P(1+rt)$

$P = S(1+rt)^{-1}$

Compound Interest

$S = P(1+i)^n$

$1 + r = (1 + \frac{k}{m})^m$

$P = S(1+i)^{-n}$

Annuity

$S = R\left[\frac{(1+i)^n - 1}{i}\right]$

$A = R\left[\frac{1-(1+i)^{-n}}{i}\right]$

Trade and Cash Discounts

$NP = L(1-r)$

$r = 1 - (1-r_1)(1-r_2)\ldots$

Markup and Markdown

$RP = C + Markup$

$MD = OP - NP$

$R = C + NP + OE$

$BEP = C + OE$

Promissory Notes

$D = Sdt$

$P = S(1-dt)$

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List of Formulas

Instalment Purchases

$$A = R\left[\frac{1-(1+i)^{-n}}{i}\right]$$

$$r = \frac{2ml}{B(n+1)}$$

$$B = RN - I\left[\frac{N(N+1)}{n(n+1)}\right]$$

Depreciation

$$Annual\ Depreciation = \frac{Cost - Salvage\ value}{Useful\ Life}$$

$$r = 1 - \sqrt[n]{\frac{s}{c}}$$

$$S = \frac{n(n+1)}{2}$$

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