



**UNIVERSITI TEKNOLOGI MARA
FINAL EXAMINATION**

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| COURSE | : | BUSINESS MATHEMATICS |
| COURSE CODE | : | MAT112 |
| EXAMINATION | : | DECEMBER 2016 |
| TIME | : | 3 HOURS |

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of ten (10) questions.
2. Answer ALL questions in the Answer Booklet. Start each answer on a new page.
3. Do not bring any material into the examination room unless permission is given by the invigilator.
4. Please check to make sure that this examination pack consists of :
 - i) the Question Paper
 - ii) a one-page Appendix 1 (Tax Rate Schedule For Personal Income)
 - iii) a one-page Appendix 2 (List of Formulae)
 - iv) an Answer Booklet – provided by the Faculty
5. Answer ALL questions in English.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This examination paper consists of 4 printed pages

QUESTION 1

The seats in a hall are arranged in a sequence such that the first row has 10 seats, the second row has 14 seats, the third row has 18 seats and so on. How many seats are there in the hall if there are 30 rows of seats.

(5 marks)

QUESTION 2

RM8,000 was deposited on 27 November 2014 into an account at a simple interest rate of 2% per annum. Find the amount in the account on 15 January 2015 by using the exact time and exact simple interest.

(7 marks)

QUESTION 3

a) On 2 March 2015, a promissory note of RM3,000 with an interest rate of 12% per annum was issued. The maturity value of the note was RM3,180.

- i) Find the term of the note in months.
- ii) Hence, find the maturity date of the note.

(7 marks)

b) Jamilah borrowed RM50,000 for 10 years from a bank and the amount she received was RM35,000. Find the discount rate charged by the bank.

(5 marks)

QUESTION 4

A bank offers two interest rates for fixed deposits as follows:

Offer A : 9% compounded every two months.

Offer B : 8.65% compounded monthly.

Find the effective rates for both offers and determine which offer provides a better return.

(7 marks)

QUESTION 5

a) Raju pays RM550 every 4 months in an investment scheme that pays an interest rate of 3% compounded every 4 months. Find the future value of the investment if the term of investment is 10 years.

(5 marks)

- b) Kenny bought a house and paid a down payment of RM32,000. The balance was borrowed from a bank which charged interest at the rate of 6% compounded monthly for 30 years with monthly payment of RM1,400.
- Find the amount borrowed.
 - If Kenny wants to settle the loan immediately after the 200th payment through a single payment, find this single payment.
- (10 marks)

QUESTION 6

A store offers two schemes of instalment purchase for an item with cash price of RM11,000. The details of the schemes are shown below:

| Item | Scheme A | Scheme B |
|-------------------------------|------------------|------------------------|
| Down payment | 15% | none |
| Type of interest | Original Balance | Constant Ratio Formula |
| Interest rate per annum | 10% | 12% |
| Number of monthly instalments | 12 | 24 |

- Find the interest charged for each scheme. (10 marks)
- Hence, determine which scheme offers lower monthly payment. (5 marks)

QUESTION 7

A retailer purchased 12 handphones for RM11,400 and made a net profit of 35% based on cost. If the operating expenses incurred were 20% based on cost, find

- the selling price for each handphone. (8 marks)
- the lowest selling price that could be offered for each handphone without incurring any loss. (3 marks)

QUESTION 8

The net price of a furniture after trade discounts of 8% and 5% was RM3,496. On 25 February 2016, an invoice of the furniture was issued with cash discount terms of 4/10, 3/15, n/30. Find

a) the list price of the furniture. (4 marks)

b) the net payment if the invoice was paid on 5 March 2016. (4 marks)

QUESTION 9

A machine costing RM45,000 has a life expectancy of 5 years and a salvage value of RM5,000. Using declining balance method, calculate

a) the book value at the end of third year. (4 marks)

b) the depreciation for the third year. (4 marks)

QUESTION 10

Mr Zam's annual income for the year 2015 was RM85,000. His spouse is a housewife and they have four children. The eldest is studying in a local university and the other children are studying in primary school. The table below shows his expenditures (RM) in the year 2015.

| | Mr Zam |
|---------------------------|--------|
| Life Insurance Premium | 4,000 |
| Books | 450 |
| Medical Insurance Premium | 1,200 |
| Zakat | 600 |

Assess his tax payable for the year 2015. (12 marks)

END OF QUESTION PAPER

TAX RATE SCHEDULE FOR PERSONAL INCOME

| | Taxable Income (RM) | Rate | Tax (RM) |
|--------------|------------------------|------|-------------|
| On the first | 2,500 | 0 | 0 |
| On the next | 2,500 | 0 | 0 |
| On the first | 5,000 | | 0 |
| On the next | 5,000 | 2 | 100 |
| On the first | 10,000 | | 100 |
| On the next | 10,000 | 2 | 200 |
| On the first | 20,000 | | 300 |
| On the next | 15,000 | 6 | 900 |
| On the first | 35,000 | | 1,200 |
| On the next | 15,000 | 11 | 1,650 |
| On the first | 50,000 | | 2,850 |
| On the next | 20,000 | 19 | 3,800 |
| On the first | 70,000 | | 6,650 |
| On the next | 30,000 | 24 | 7,200 |
| On the first | 100,000 | | 13,850 |
| On the next | Every RM after | 26 | ----- |

LIST OF FORMULAE

| | |
|-------------------------------------------------------------------|-------------------------------------------------------|
| 1. $T_n = a + (n-1)d$ | 2. $S_n = \frac{n}{2}[2a + (n-1)d]$ |
| 3. $T_n = ar^{n-1}$ | 4. $S_n = \frac{a(r^n - 1)}{r - 1}$ |
| 5. $S = P(1 + rt)$ | 6. Proceeds = $S(1 - dt)$ |
| 7. $r = \frac{d}{1 - dt}$ | 8. $d = \frac{r}{1 + rt}$ |
| 9. $S = P(1 + i)^n$ | 10. $r_e = (1 + i)^m - 1$ |
| 11. $S = R \left[\frac{(1 + i)^n - 1}{i} \right]$ | 12. $A = R \left[\frac{1 - (1 + i)^{-n}}{i} \right]$ |
| 13. $SP = C + M$ | 14. $GP = OE + NP$ |
| 15. $NP = LP(1 - d_1)(1 - d_2) \dots (1 - d_n)$ | 16. $r = \frac{2mI}{B(n+1)}$ |
| 17. $r = 1 - \sqrt[n]{\frac{S}{C}}$ | 18. $BV_n = C(1 - r)^n$ |
| 19. $OPB = (R \times k) - I \left(\frac{k(k+1)}{n(n+1)} \right)$ | |