

**FINAL EXAMINATION**

**BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN COMPUTER
APPLICATION DEVELOPMENT
BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN CYBER
SECURITY**

COURSE : PREPARATORY MATHEMATICS

COURSE CODE : PPM1010

DURATION : 2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES:

1. This question paper consists of **FIVE (5)** questions.
2. Answer ALL the questions in the Answer Booklet provided.
3. Please check to make sure that this examination pack consists of:
 - i. The Question Paper
 - ii. An Answer Booklet
 - iii. Appendix 1, Appendix 2(i), Appendix 2(ii), Appendix 2(iii)
4. Do not bring any material into the examination hall. Electronic calculator is allowed.
5. Please write your answer using permanent ink.

MYKAD/ PASSPORT NO : _____

ID. NO. : _____

LECTURER : _____

SECTION : _____

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

This question paper consists of 7 printed pages including the front page

QUESTION 1

- a. Consider the compound argument.

"If the sales target is not achieved or the performance evaluation is unsatisfactory, then the employee will not receive a bonus."

- i. Write the primary propositions using variables p , q and r . (3 marks)

- ii. Write the following statements in terms of logical connectives. (2 marks)

- b. The following primary statements are given:

a : The employee attends a training workshop.

b : The employee receives a promotion.

c : The employee receives a salary increment.

Write the corresponding compound statement in words for each of the following symbolic forms.

- i. $(a \wedge b) \rightarrow c$ (1 mark)

- ii. $a \vee (\sim b \wedge c)$ (1 mark)

- c. Construct a truth table to show the following statement is tautology, contingency or contradiction.

$$(p \wedge \sim q) \rightarrow (\sim q \vee \sim r)$$
 (5 marks)

- d. Determine whether the argument given is VALID or INVALID by using the truth table.

$$H_1 : a \wedge \sim b$$

$$H_2 : \sim a$$

$$\therefore C : b$$

(6 marks)

(Total: 18 marks)

QUESTION 2

A beverage company recorded the amount of juice produced (in litres) in a sample of 20 batches during a production shift. The data obtained are:

52.4	50.1	49.2	51.8	48.9	50.7	52.6	47.5	49.9	51.0
48.5	51.2	49.8	52.1	47.9	50.4	53.0	48.7	51.5	49.6

- a. Find the mean, median and mode for the above data.
(4 marks)
 - b. Calculate the standard deviation of the amount of juice produced.
(4 marks)
 - c. Calculate and comment on the shape of the distribution.
(3 marks)
- (Total: 11 marks)

QUESTION 3

A hotel manager recorded the number of guests checking into the hotel each day during a holiday season. A random sample of 50 days was selected and the frequency distribution is shown below.

Table 1

Number of Guests per Day	Number of Days
80 – 89	5
90 – 99	8
100 – 109	15
110 – 119	12
120 – 129	7
130 – 139	3

- Calculate the mean number of guests checking into the hotel per day. Interpret the results.
(3 marks)
- Find the standard deviation of the data.
(3 marks)
- Determine the median number of guests per day and explain its meaning.
(4 marks)
- Another hotel recorded the number of guests checking into the hotel per day, with a mean of 105 guests and a standard deviation of 9 guests. Determine which hotel shows more consistency in the number of daily guest check-ins.
(5 marks)

(Total: 15 marks)

QUESTION 4

- a. A university club designed a communication network among seven student leaders represented by vertices a, b, c, d, e, f and g. The graph is shown in Figure 1.

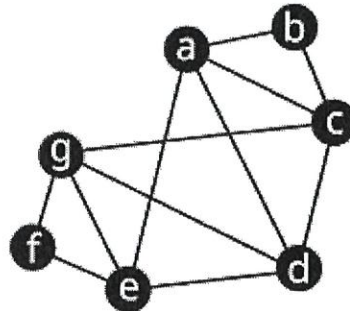


Figure 1

- i. Determine the number of edges, $n(E)$ in Figure 1. (2 marks)
 - ii. Find the degree for each vertex. Then, state the total degree of the graph. Provide your answer in a table. (3 marks)
- b. A delivery company uses a directed weighted graph to represent the delivery routes between warehouses, where the weights represent delivery cost in RM. The vertices and directed weighted edges are given below.

$$V = \{P, Q, R, S, T\}$$

$$E = \{(P, Q, 18), (P, R, 9), (Q, S, 7), (R, Q, 16), (R, T, 14), (S, T, 11)\}$$

Draw the directed weighted graph.

(5 marks)

- c. Determine whether graphs from Figure 2 and Figure 3, respectively, are simple or non-simple graphs. Provide reasons to your answer.

i.

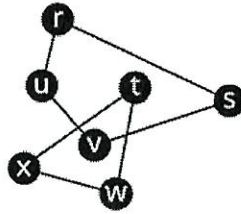


Figure 2

(2 marks)

ii.

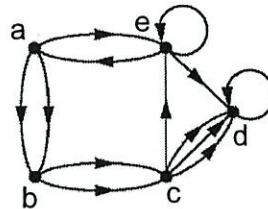


Figure 3

(2 marks)

- d. A courier service uses the weighted graph in Figure 4 to represent the travelling time (in minutes) between distribution centres a , b , c , and d . The weights on the edges indicate the travelling time between the centres.

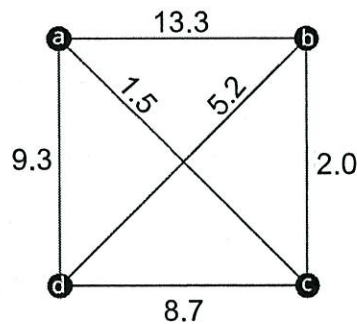


Figure 4

- List all possible paths connecting distribution centre a to distribution centre c .
(2 marks)
- State the fastest path from distribution centre a to distribution centre c .
(2 marks)
- Determine the shortest travelling time from distribution centre a to distribution centre c .
(2 marks)

(Total: 20 marks)

QUESTION 5

Farid is an architect employed by a private construction company, while his wife Nurul operates a home-based catering business. They have four children aged 18, 15, 11, and 4 years old. The 18-year-old child is currently pursuing a diploma programme at a local college, while the youngest child attends a registered childcare centre. They have elected for separate assessment for the Year of Assessment 2025 and all child-related reliefs are claimed by Farid.

The details of their financial information for the year ended 31 December 2025 are as follows:

Table 2

Particulars	Farid (RM)	Nurul (RM)
Annual Income	95,000	34,000
EPF Contributions	5,200	1,800
Life Insurance Premiums (LIP)	3,000	1,000
Medical Expenses for Parents	2,500	-
Parents Dental Treatment	1,200	800
SSPN Savings	6,000	2,500
Lifestyle Expenses	2,800	2,200
Childcare Fees	-	3,500
Zakat	1,800	500

Calculate the tax payable of Farid and Nurul under separate assessment for the Year of Assessment 2025.

(Total: 16 marks)

(TOTAL: 80 MARKS)

END OF QUESTION PAPER

APPENDIX 1

Logical Reasoning

p	q	$\sim p$	$p \wedge q$	$p \vee q$	$p \rightarrow q$	$p \leftrightarrow q$
T	T	F	T	T	T	T
T	F	F	F	T	F	F
F	T	T	F	T	T	F
F	F	T	F	F	T	T

Sample Measurements

i. Mean, $\bar{x} = \frac{\sum x}{n}$ or $\bar{x} = \frac{\sum fx}{n}$

ii. Median, $\tilde{x} = L_m + \left\{ \frac{\frac{n}{2} - \sum f_{m-1}}{f_m} \right\} . C$

iii. Mode, $\hat{x} = L_{mo} + \left\{ \frac{\Delta_1}{\Delta_1 + \Delta_2} \right\} . C$

iv. Standard Deviation, $s = \sqrt{\frac{1}{n-1} \left[\sum x^2 - \frac{(\sum x)^2}{n} \right]}$ OR $s = \sqrt{\frac{1}{n-1} \left[\sum fx^2 - \frac{(\sum fx)^2}{n} \right]}$

v. Coefficient of Variation, $CV = \frac{s}{\bar{x}} \times 100$

vi. Pearson's Measure of Skewness = $\frac{\text{Mean} - \text{Mode}}{\text{Standard deviation}}$ or $\frac{3(\text{Mean} - \text{Median})}{\text{Standard deviation}}$

APPENDIX 2(i)

Tax Relief 2025

No	Individual Relief Types	Amount (RM)
1	Individual and dependent relatives	9,000
2	Expenses for parents and grandparents: i. Medical treatment, dental treatment, special needs and carer expenses (Medical condition certified by medical practitioner) ii. Complete medical examination (Restricted to RM1,000)	8,000 (Restricted)
3	Purchase of basic supporting equipment for disabled self, spouse, child or parent	6,000 (Restricted)
4	Disabled individual	7,000
5	Education fees (Self): i. Other than a degree at masters or doctorate level – Course of study in law, accounting, islamic financing, tehcnical, vocational, industrial, scientific or technology ii. Degree at masters or doctorate level – Any course of study iii. Course of study undertaken for the purpose of upskilling or self-enhancement (Restricted to RM2,000)	7,000 (Restricted)
6	Medical expenses on: i. Serious diseases for self, spouse or child ii. Fertility treatment for self or spouse iii. Vaccination for self, spouse and child (Restricted to RM1,000) iv. Dental examination and treatment (Restricted RM1,000)	10,000 (Restricted)
7	Expenses (Restricted to RM1,000) on: i. Complete medical examination for self, spouse or child ii. COVID-19 detection test including purchase of self-detection test kit for self, spouse or child iii. Mental health examination or consultation for self, spouse or child iv. Purchase of self-health monitoring equipment v. Fees for disease detection tests	
8	Expenses (Restricted to RM6,000) for child aged 18 and below: i. Assessment of intellectual disability diagnosis ii. Early intervention programme / intellectual disability rehabilitation treatment	

9	Lifestyle Expenses for the use / benefit of self, spouse or child in respect of: i. Purchase or subscription of books / journals / magazines / newspapers / other similar publications (Not banned reading materials) ii. Purchase of personal computer, smartphone or tablet (Not for business use) iii. Payment of monthly bill for internet subscription (Under own name) iv. Skill improvement / personal development course fee	2,500 (Restricted)
10	Lifestyle Additional relief for the use / benefit of self, spouse, child and parents in respect of: i. Purchase of sports equipment for any sports activity as defined under the Sports Development Act 1997 ii. Payment of rental or entrance fee to any sports facility iii. Payment of registration fee for any sports competition where the organizer is approved and licensed by the Commissioner of Sports under the Sports Development Act 1997 iv. Gymnasium membership fee / sports training	1,000 (Restricted)
11	Purchase of breastfeeding equipment for own use for a child aged 2 years and below (Deduction allowed once in every TWO (2) years of assessment)	1,000 (Restricted)
12	Childcare fees to a registered childcare centre / kindergarten for a child aged 6 years and below	3,000 (Restricted)
13	Net deposit in Skim Simpanan Pendidikan Nasional (Net deposit is the total deposit in 2025 MINUS total withdrawal in 2025)	8,000 (Restricted)
14	Husband / wife / payment of alimony to former wife	4,000 (Restricted)
15	Disabled husband / wife	6,000
16a	Each unmarried child and under the age of 18 years old	2,000

16b	Each unmarried child of 18 years and above who is receiving full-time education ("A-Level", certificate, matriculation or preparatory courses).	2,000
	Each unmarried child of 18 years and above that: i. receiving further education in Malaysia in respect of an award of diploma or higher (excluding matriculation/preparatory courses). ii. receiving further education outside Malaysia in respect of an award of degree or its equivalent (including Master or Doctorate). iii. the instruction and educational establishment shall be approved by the relevant government authority.	8,000
16c	Disabled child	8,000
	Additional exemption of RM8,000 disable child age 18 years old and above, not married and pursuing diplomas or above qualification in Malaysia @ bachelor degree or above outside Malaysia in program and in Higher Education Institute that is accredited by related Government authorities.	8,000
17	Life insurance and EPF Civil servants' pension schemes, non-civil servants pension schemes and self-employed category: i. Mandatory contributions to approved schemes or voluntary contributions to EPF (excluding private retirement schemes) or contributions under any written law (Restricted to RM4,000) ii. Life insurance premium payments or family takaful contributions or additional voluntary contributions to EPF (Restricted to RM3,000)	7,000 (Restricted)
18	Deferred Annuity and Private Retirement Scheme (PRS)	3,000 (Restricted)
19	Education and medical insurance	4,000 (Restricted)
20	Contribution to the Social Security Organization (SOCSO)	350 (Restricted)
21	Expenses on charging facilities for Electric Vehicle and domestic food waste composting machine (Not for business use)	2,500 (Restricted)

22	Payment of housing loan interest for first home ownership (Sale and purchase agreement from 1 January 2025 to 31 December 2027)	
	Relief Limit: i. Residential house price up to RM500,000 or	7,000
	ii. Residential house price exceeding RM500,000 up to RM750,000	5,000

APPENDIX 2(ii)

Tax rate schedule for personal income for 2025

Chargeable Income	Calculations (RM)	Rate %	Tax (RM)
0 - 5,000	On the First 5,000	0	0
5,001 - 20,000	On the First 5,000 Next 15,000	1	0 150
20,001 - 35,000	On the First 20,000 Next 15,000	3	150 450
35,001 - 50,000	On the First 35,000 Next 15,000	6	600 900
50,001 - 70,000	On the First 50,000 Next 20,000	11	1,500 2,200
70,001 - 100,000	On the First 70,000 Next 30,000	19	3,700 5,700
100,001 - 400,000	On the First 100,000 Next 300,000	25	9,400 75,000
400,001 - 600,000	On the First 400,000 Next 200,000	26	84,400 52,000
600,001 - 2,000,000	On the First 600,000 Next 1,400,000	28	136,400 392,000
Exceeding 2,000,000	On the First 2,000,000 Next ringgit	30	528,400

APPENDIX 2(iii)

Income Tax Rebates for Resident Individual with Chargeable Income Less Than RM35,000

No	Tax Rebates	Year Of Assessment 2001 - 2008 (RM)	Year Of Assessment 2009 Onwards (RM)
a	Separate Assessment Wife Husband	- 350 350	- 400 400
b	Joint Assessment Wife Husband	- 350 350	- 400 400
	Total	700	800
	Assessment Where Husband Or Wife Does Not Has Any Total Income Wife Husband	- 350 350	- 400 400
	Total	700	800