

Structured Questions

Soalan Struktur

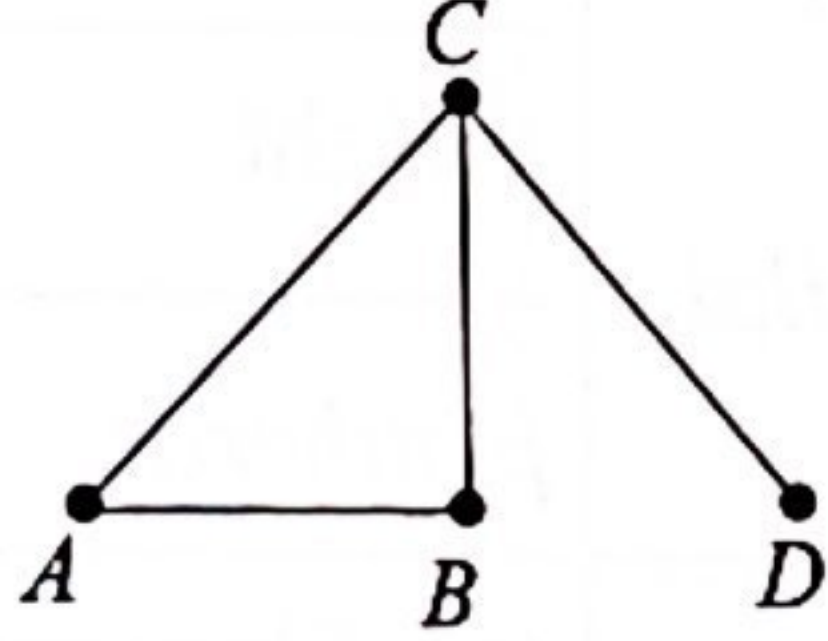
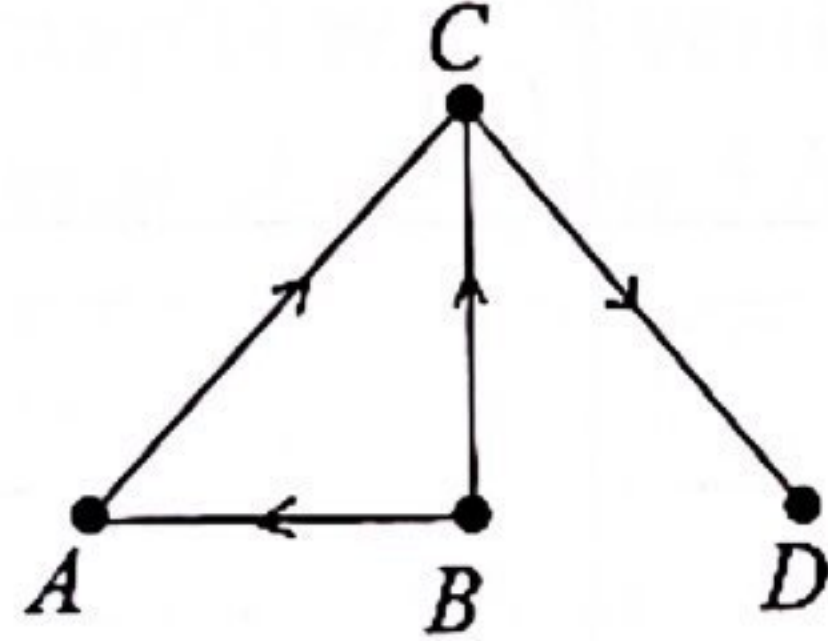
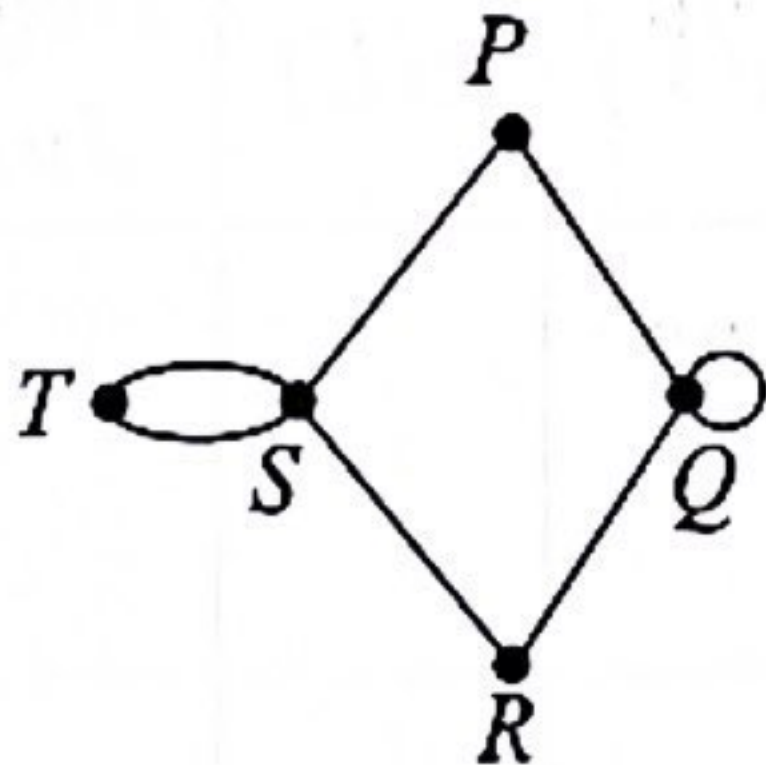
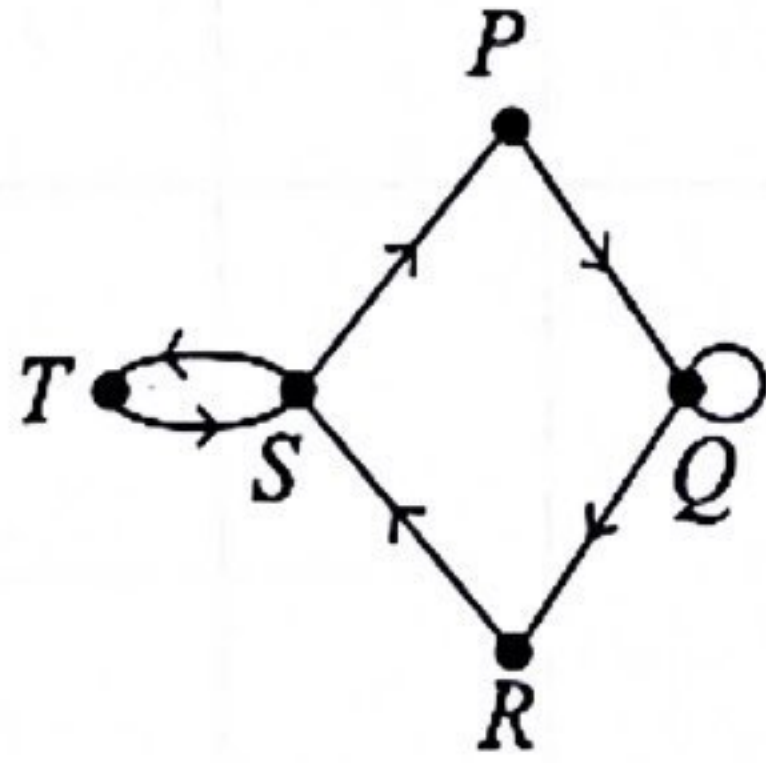
1 Fill in the blanks in the table provided:

Isikan tempat kosong dalam jadual berikut:

Definition/Definisi	Diagram/Rajah
(a) A graph is a series of _____ either _____ or not to each other through _____. <i>Graf ialah suatu siri _____ sama ada _____ atau tidak antara satu sama lain melalui _____.</i>	
(b) A network is a _____ which has at least a pair of related _____. <i>Rangkaian ialah suatu _____ yang mempunyai sekurang-kurangnya satu pasangan _____.</i>	
(c) A point is known as _____ and line is known as _____. <i>Bintik juga dikenali sebagai _____ dan garis juga dikenali sebagai _____.</i>	
(d) The _____ of a vertex is the number of _____ connected to other vertices. <i>_____ bagi suatu bucu ialah bilangan tepi yang mengaitkannya dengan _____ yang lain.</i>	
(e) A simple graph is an _____ graph, unweighted graph without any _____ or multiple _____. <i>Graf mudah ialah graf _____ tanpa _____ atau berbilang _____.</i>	

2 List down the set of vertices and edges and degrees for the directed and undirected graphs in the table below.

Senaraikan set bucu dan tepi serta darjah untuk graf terarah dan graf tidak terarah dalam jadual di bawah.

Type of graph <i>Jenis graf</i>	Graph <i>Graf</i>	Set of vertices and edges <i>Set bucu dan tepi</i> (Set V and Set E)	Degrees <i>Darjah</i>
Simple graph <i>Graf mudah</i>	Undirected graph <i>Graf tak terarah</i> 	$V =$ $E =$	$d(A) =$ $d(B) =$ $d(C) =$ $d(D) =$ $\sum d(V) =$
	Directed graph <i>Graf terarah</i> 	$V =$ $E =$	$d(A) =$ $d(B) =$ $d(C) =$ $d(D) =$ $\sum d(V) =$
Multigraph (graph with loops and multiple edges) <i>Multigraf</i> (grafik dengan gelung dan pelbagai bucu)	Undirected graph <i>Graf tak terarah</i> 	$V =$ $E =$	$d(P) =$ $d(Q) =$ $d(R) =$ $d(S) =$ $d(T) =$ $\sum d(V) =$
	Directed graph <i>Graf terarah</i> 	$V =$ $E =$	$d(P) =$ $d(Q) =$ $d(R) =$ $d(S) =$ $d(T) =$ $\sum d(V) =$

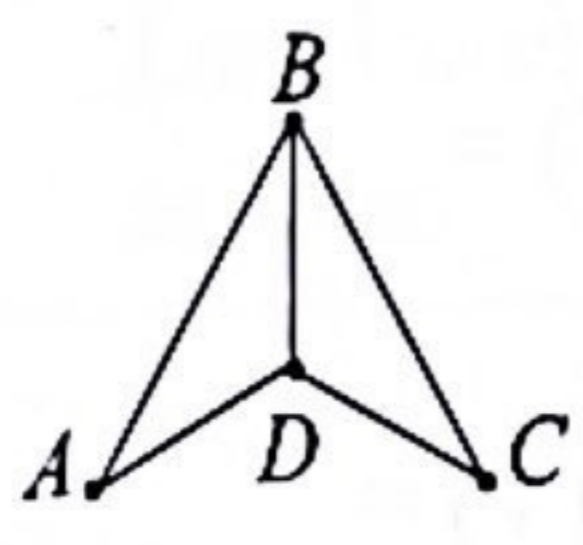
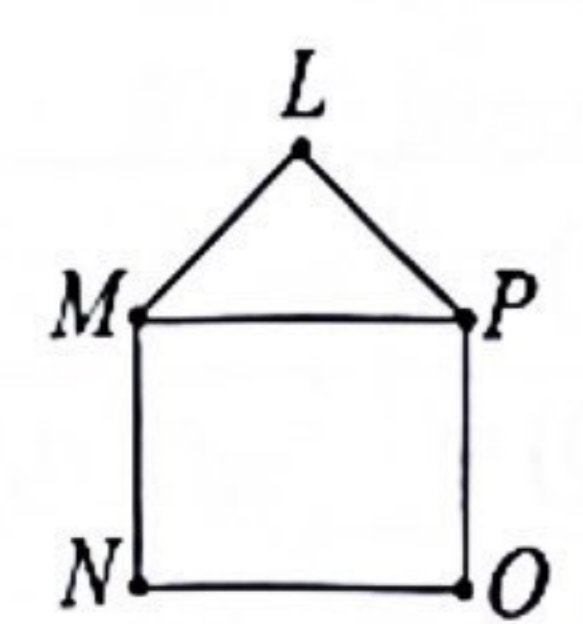
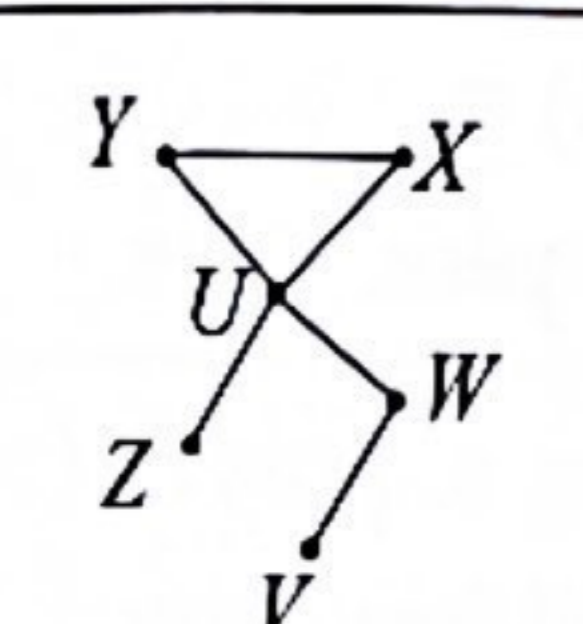
3 Compare and contrast the similarities and differences between weighted graphs and unweighted graphs.

Banding dan beza persamaan dan perbezaan antara graf berpemberat dan graf tak berpemberat.

	Weighted graphs <i>Graf berpemberat</i>	Unweighted graphs <i>Graf tak berpemberat</i>
Types of graph <i>Jenis graf</i>	(a) (b)	
Edges <i>Tepi</i>	_____ with a value of weight _____ <i>dengan satu nilai</i> <i>pemberat</i>	_____ with a value of weight _____ <i>dengan satu nilai</i> <i>pemberat</i>
Example <i>Contoh</i>	(a) Distance between 2 cities <i>Jarak di antara 2 bandar</i> (b) (c) (d)	(a) Flow map <i>Peta alir</i> (b) (c) (d)
Diagram <i>Rajah</i>		

4 Complete the table below according to the given graph.

Lengkapkan jadual di bawah berdasarkan graf yang diberi.

Graph <i>Graf</i>	V	E	$n(V)$	$n(E)$	Degree sequence <i>Jujukan darjah</i>	$\sum d(V)$
						
						
						

Subjective Questions

Soalan Subjektif

1 Sketch all the simple graphs with 5 vertices in the table provided.

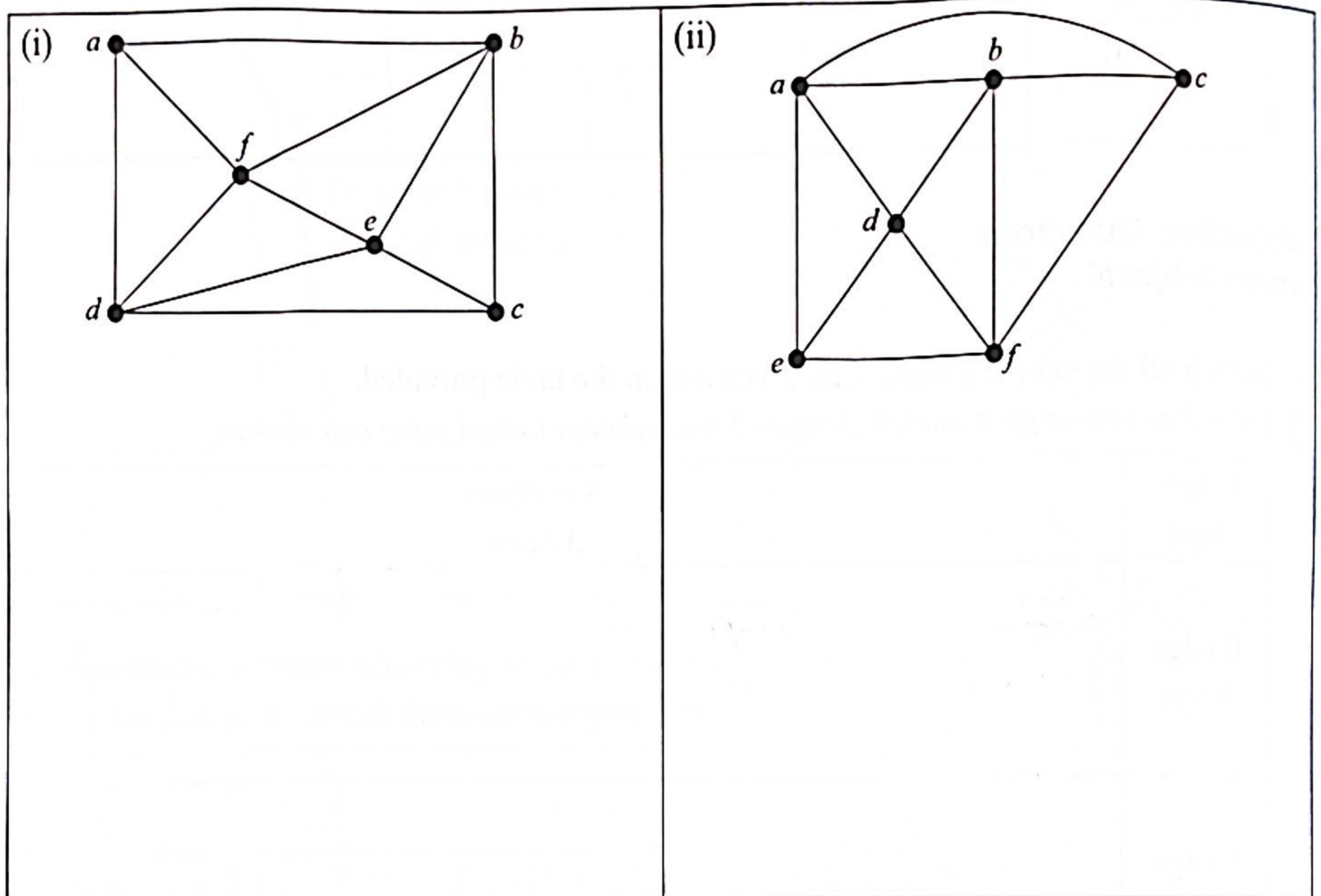
Lakarkan semua graf mudah dengan 5 bucu dalam jadual yang disediakan.

Edges <i>Tepi</i>	5 vertices <i>5 bucu</i>
0 edge <i>0 tepi</i>	
1 edge <i>1 tepi</i>	
2 edges <i>2 tepi</i>	
3 edges <i>3 tepi</i>	
4 edges <i>4 tepi</i>	

2 For each graph, find the

Untuk setiap graf, cari

- (a) set of vertices V and the number of vertices, $n(V)$,
set bucu V dan bilangan bucu, $n(V)$,
- (b) set of edges, E and the number of edges, $n(E)$,
set tepi, E dan bilangan tepi, $n(E)$,
- (c) degree of each vertex,
darjah setiap bucu,
- (d) sum of the degrees.
jumlah darjah.



Intermediate

3 Draw the graph of

Lukiskan graf bagi

- (a) $G = \{V, E\}$ where $V = \{C, D, E, F\}$ and $E = \{CD, DE, EF, CF, DF\}$
 $G = \{V, E\}$ di mana $V = \{C, D, E, F\}$ dan $E = \{CD, DE, EF, CF, DF\}$

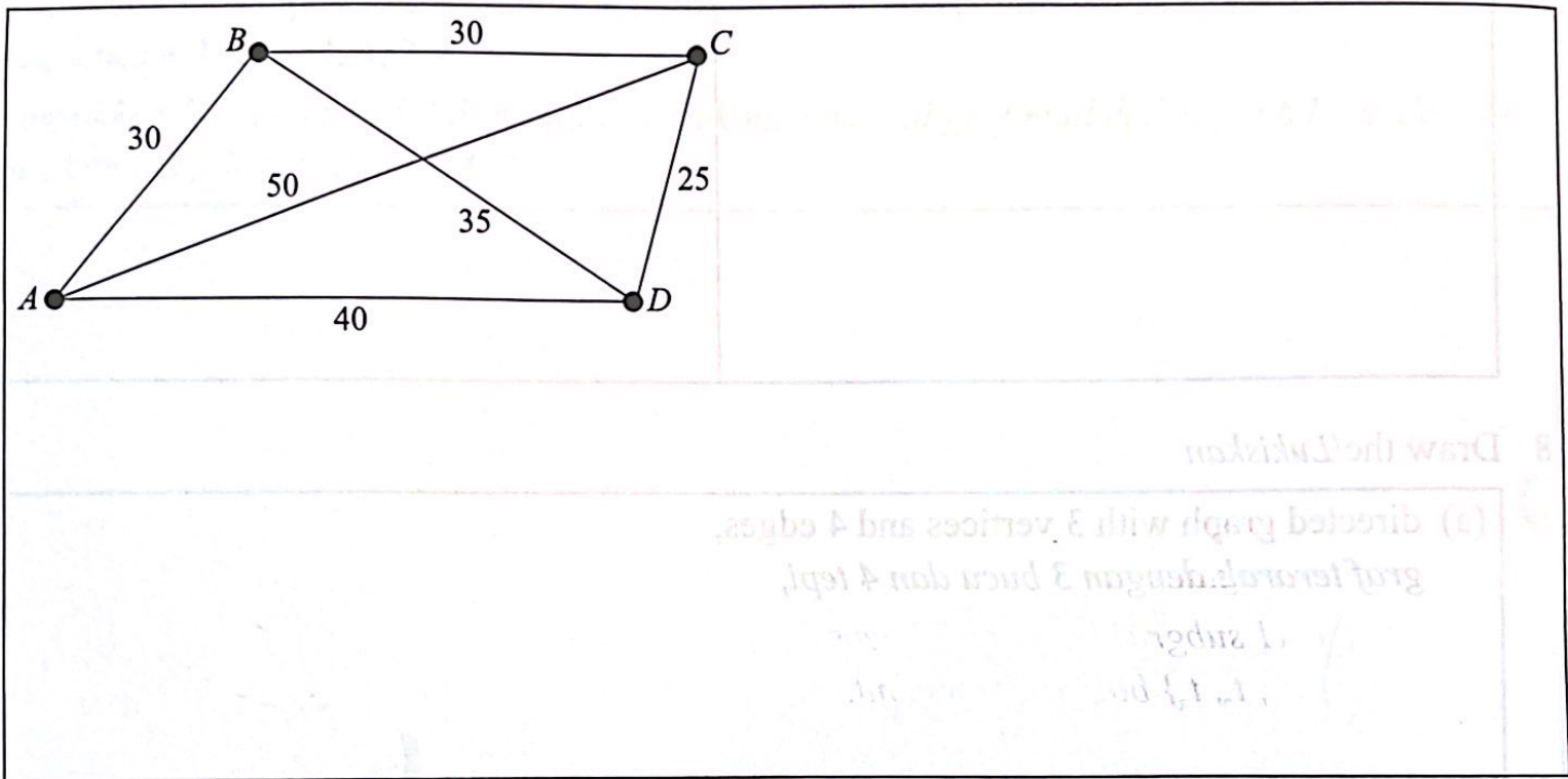
(b) $G = \{V, E\}$ where $V = \{P, Q, R, S, T\}$ and $E = \{PQ, PR, RS, PT\}$
 $G = \{V, E\}$ di mana $V = \{P, Q, R, S, T\}$ dan $E = \{PQ, PR, RS, PT\}$

(c) $G = \{V, E\}$ where $V = \{A, B, C, D\}$ and $E = \{BC, CD, CD, DB, BB\}$
 $G = \{V, E\}$ di mana $V = \{A, B, C, D\}$ dan $E = \{BC, CD, CD, DB, BB\}$

(d) two different graphs for/ *dua graf berbeza untuk*
 $V(G) = \{1, 2, 3, 4\}$ and/ *dan* $E(G) = \{\{1,2\}, \{1,4\}, \{1,4\}, \{1,3\}, \{3,2\}, \{2,2\}\}$

- 9 The diagram shows a map of 4 cities and the distance between them in kilometers. If a salesperson wants to visit each city only once, provided that he or she starts and ends in Town A. What is the route from town to town that can minimize the distance that the salesperson goes through?

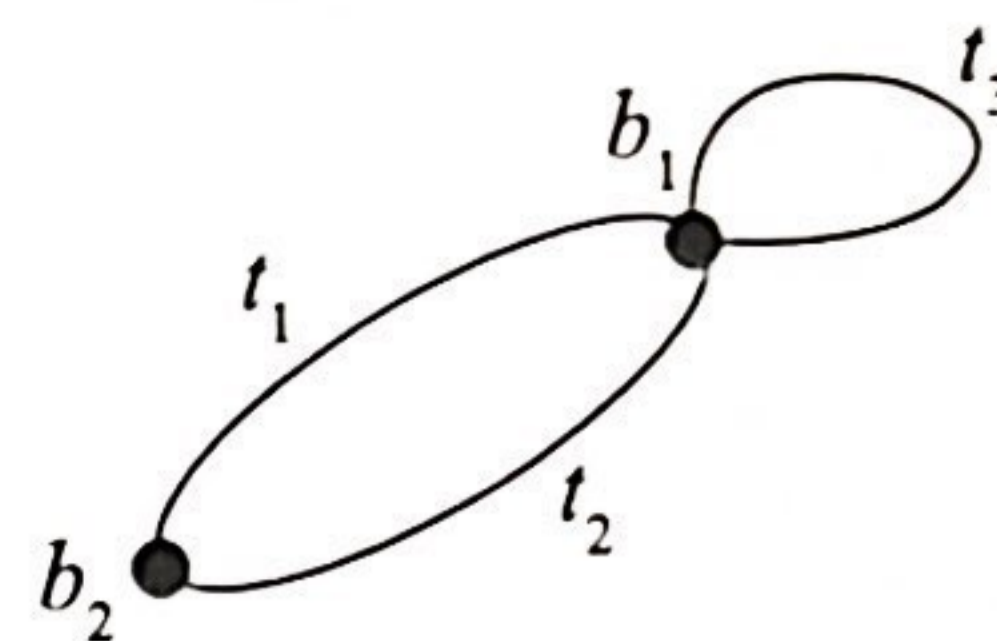
Rajah menunjukkan peta 4 bandar dan jarak diantaranya dalam kilometer. Jika seorang jurujual ingin melawat setiap bandar hanya sekali, dengan syarat bahawa dia bermula dan berakhir di Bandar A. Apakah laluan dari bandar ke bandar yang dapat meminimumkan jarak yang dilalui oleh jurujual tersebut?



Intermediate

12 Draw all 11 sub-graphs for graph G by setting the vertices $\{b_1, b_2\}$ and assigning edges $\{t_1, t_2, t_3\}$ to the graph:

Lukis semua 11 subgraf bagi graf G dengan set bucu $\{b_1, b_2\}$ dan set tepi $\{t_1, t_2, t_3\}$ bagi graf tersebut:



(1)	(2)	(3)	(4)
(5)	(6)	(7)	(8)
(9)	(10)	(11)	

17 Based on each graph given, / Berdasarkan kepada setiap graf yang diberi,

Advanced

HOIS

- (a) draw a tree using all the vertices with a minimum total weight,
lukis satu pokok menggunakan semua bucu dengan jumlah berat minimum,
- (b) calculate the minimum total weight / *hitung jumlah berat minimum.*

