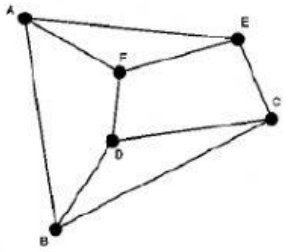
GRADE 12 EXAMINATION

ADVANCED PROGRAMME MATHEMATICS: PAPER II

4.2 Is the following graph regular? Justify your answer.



(2)

4.3 The degree of each vertex of a connected graph is given below. Which graph or graphs are simple Eulerian circuits?

(a) 2, 4, 6, 4, 2

(b) 4, 1, 2, 3, 4

(c) 2, 2, 4, 2, 2

(d) 3, 3, 4, 3, 3 (2)

4.4 Which of the following graphs are isomorphic to each other?

Fig.1:

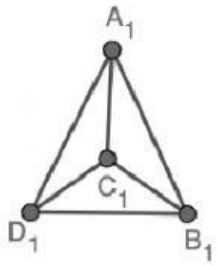


Fig.2:

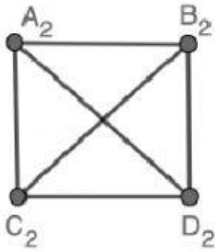
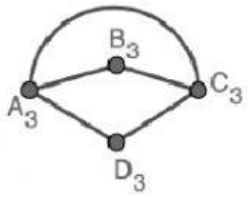


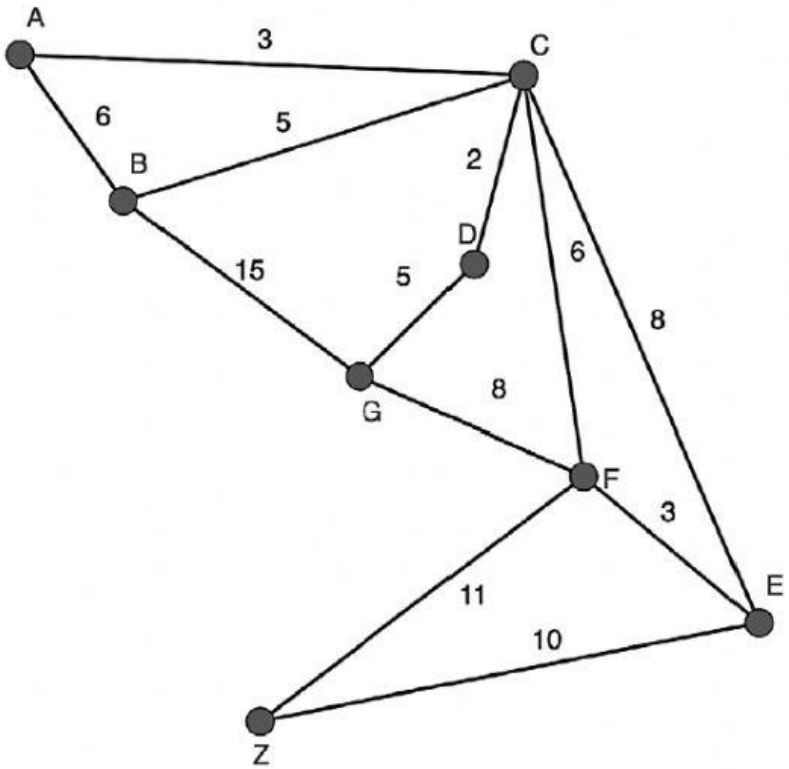
Fig.3:



QUESTION 5

5.1 A Moova driver is parked at A and gets a request to collect friends from locations: B, C, D, E, F and G with instructions to drop them off at destination Z. The weights of the edges represent time in minutes.

Using an appropriate algorithm and removing vertex D, calculate the lower bound time of his journey.



5.2 A Moova driver has a separate request to travel from A to Z on the above graph (map). Help the driver by suggesting the **shortest route**. Show clear evidence of your working and reasoning. Answers only will get zero credit. (8)

5.3 The Moova driver thinks he has a short cut of time t, between vertices B and F. The driver is unsure of the exact time of this short cut but does know that, $2 < t \leq 4, t \in \mathbb{Z}$. Would you recommend he take the short cut? Justify your answer. (3)