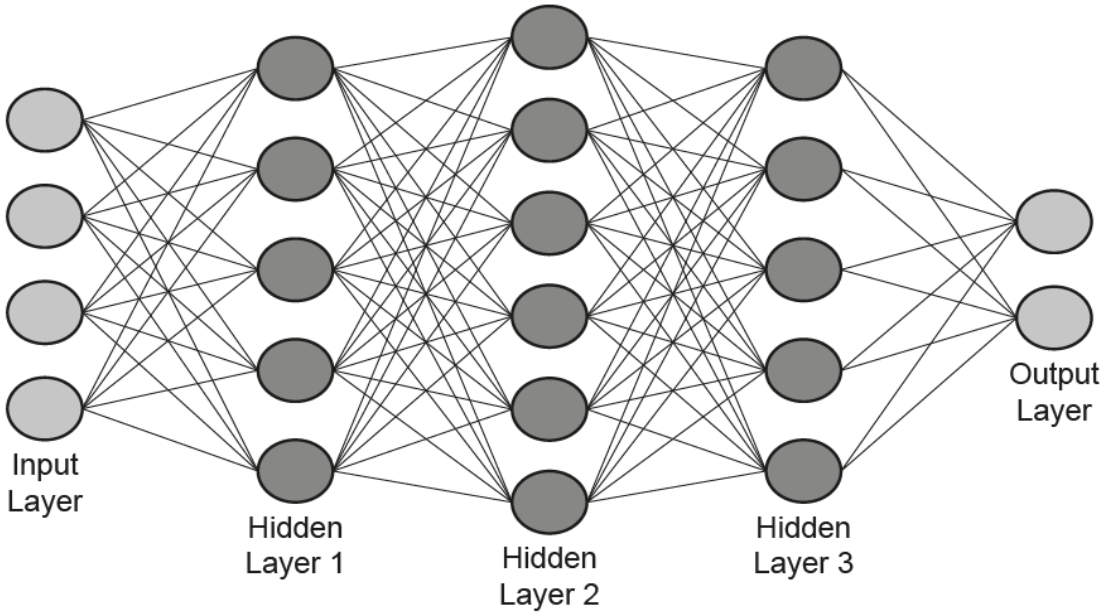
**Artificial Intelligence (AI) – 2021 A2 9618**

**1.** Nov/2021//Paper_31/No.9

**(a)** The diagram shown represents an artificial neural network.




**(i)** State the reason for having multiple hidden layers in an artificial neural network.

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**(ii)** Explain how artificial neural networks enable machine learning.

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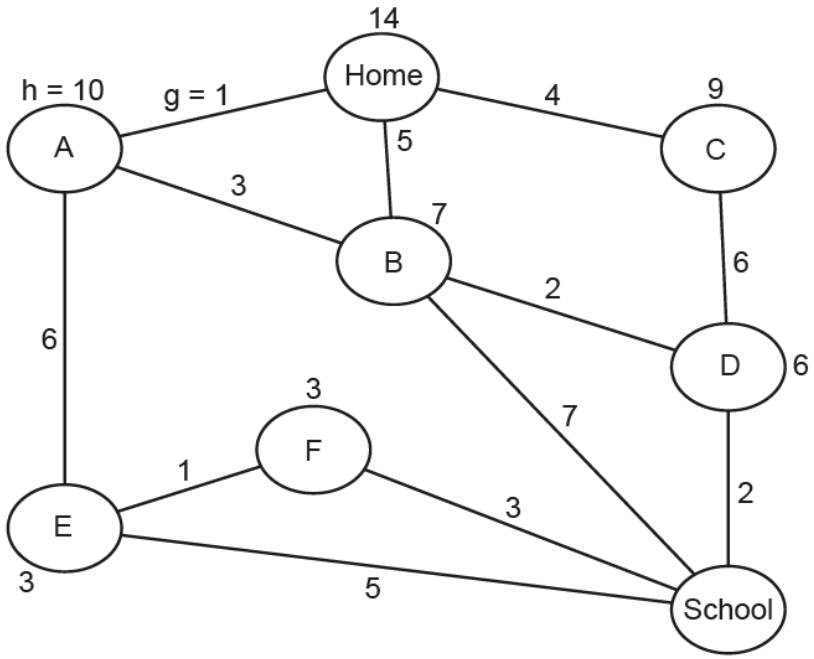
**(b)** Find the shortest path between the Home and School nodes using the A* algorithm. Show your working in the table provided.

The first two rows in the table have been completed.




| Node | Cost from Home node (g) | Heuristic (h) | Total (f = g + h) |
|---|---|---|---|
| Home | 0 | 14 | 14 |
| A | 1 | 10 | 11 |
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| Final path | |
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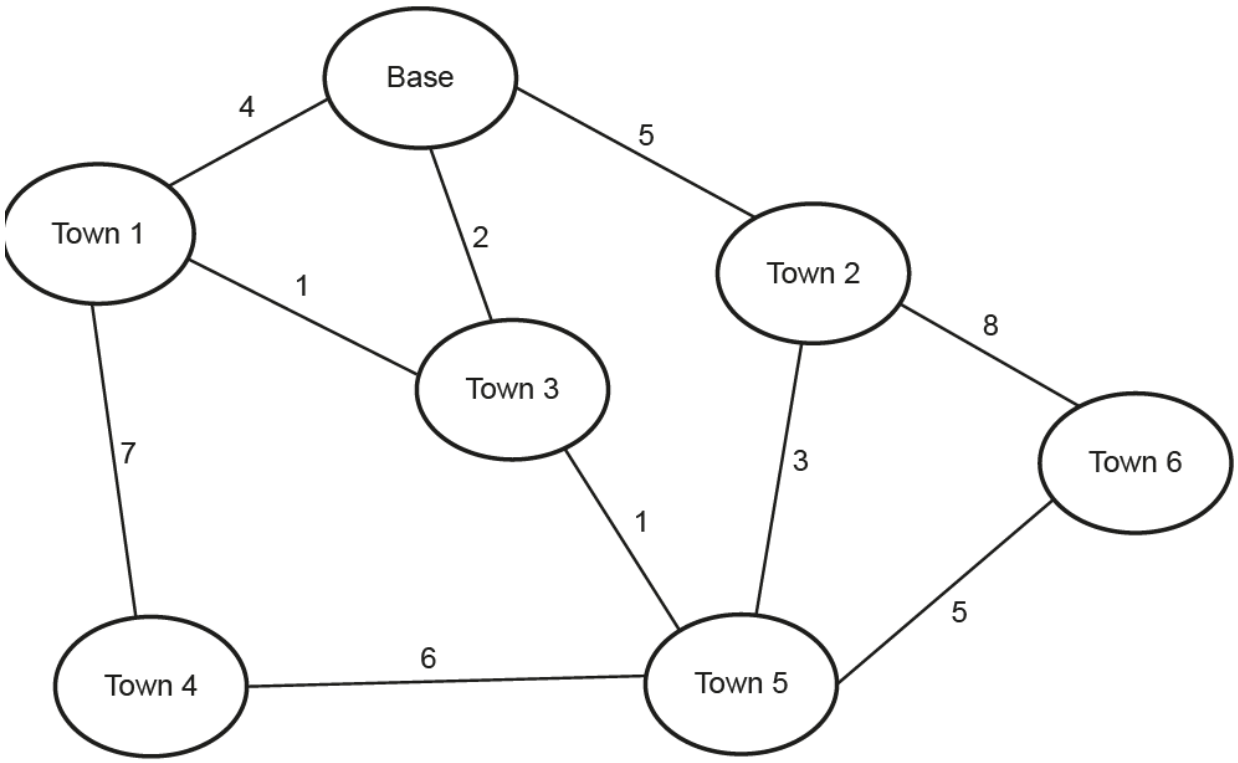
[5]

**2.** June/2021//Paper_31/No.5

**(a)** Calculate the shortest distance between the base and each of the other towns in the diagram using Dijkstra's algorithm.

Show your working **and** write your answers in the table provided.




Working .....

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Answers

| Town 1 | Town 2 | Town 3 | Town 4 | Town 5 | Town 6 |
|---|---|---|---|---|---|
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[5]

**(b)** Explain the use of graphs to aid Artificial Intelligence (AI).

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