

Put your answers for Part 1 in the following table

1	2	3	4	5	6	7	8	9	10	11	12

Part 1:

(1 mark each) [12 marks]

Choose the right answer:

1	..... are rules for choosing those branches in a state space that are most likely to lead to an acceptable problem solution.		
a	Blind search	b	Robotics
c	Heuristics	d	a and b

2	Suppose the universe, $U$ , is the set $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$ , Let $A$ be the set $\{1, 3, 5, 7, 9\}$ , Let $B$ be the set $\{0, 3, 4, 7, 8\}$ , Then $ A \cup B  = \dots\dots\dots$		
a	8	b	10
c	20	d	25

3	If a search algorithm is guaranteed to find a minimal path to a solution whenever such a path exists, this is definition of .....		
a	Rationality	b	Monotonicity
c	Admissibility	d	INFORMEDNESS

4	In conceptual graph, if a graph contains two duplicate relations, then one of them may be deleted, along with all its arcs. What is the name of this operation?		
a	Copy	b	Join
c	a and b	d	Simplify

5	What is the probability of getting a total of 7 or 11 when a pair fair dice is tossed?		
a	2/9	b	1/6
c	1/6	d	2/7

6	How many strings of 4 decimal digits, that do not contain the same digit twice?		
a	5040	b	4050
c	720	d	120

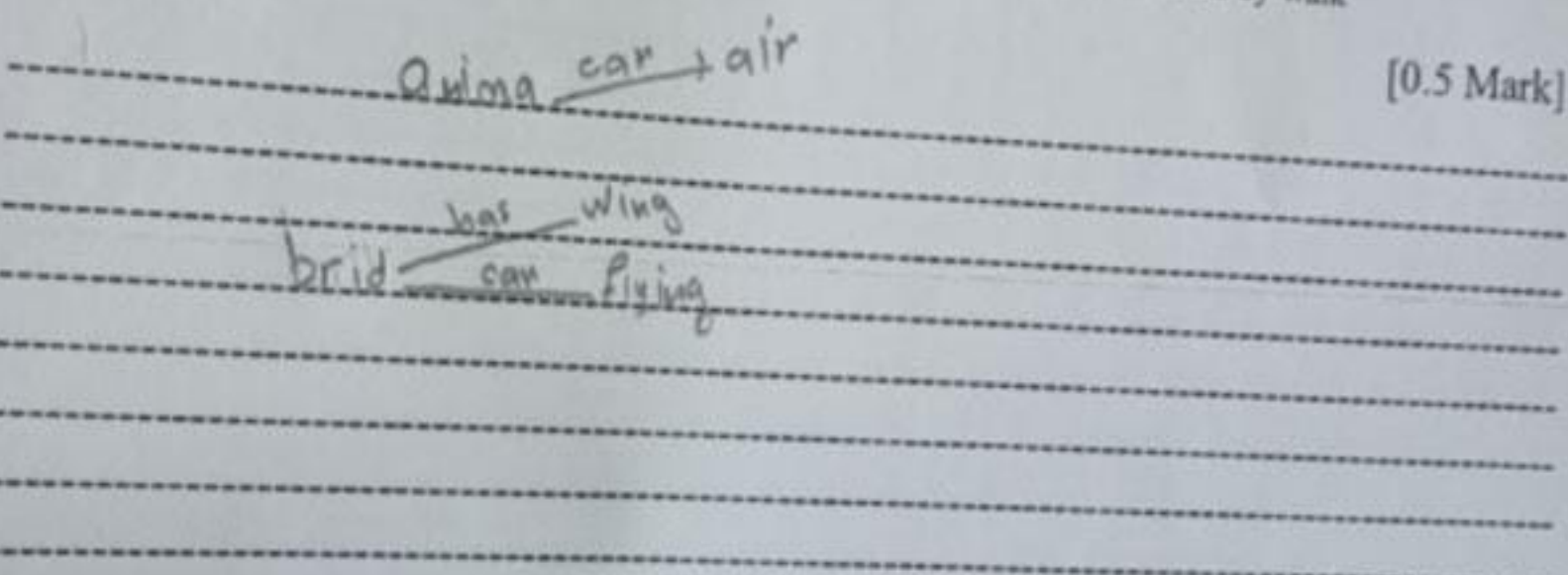
**Part 2: Answer the following questions:**

1-

a- Draw the semantic network for:

"Parrot is a bird. Typically, bird has wings and travel by flying. Bird category falls under animal kingdom. All animal requires air to breathe. Ostrich is a bird but travels by walk"

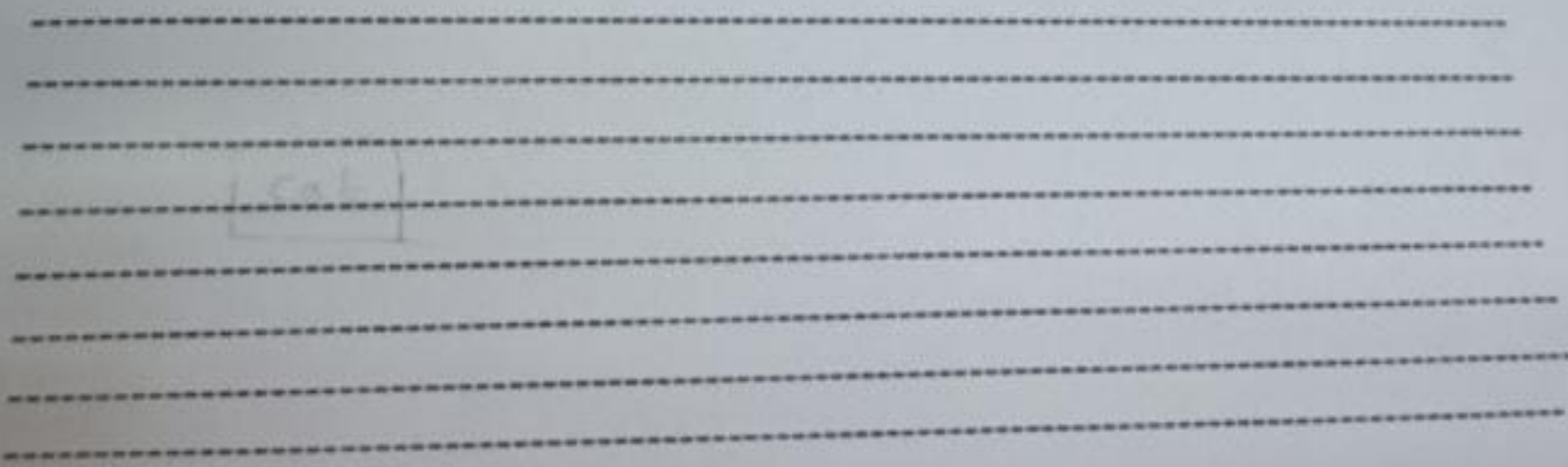
[0.5 Mark]



b- Draw conceptual graph of the following sentence:

"There is no yellow cat"

[0.5 Mark]



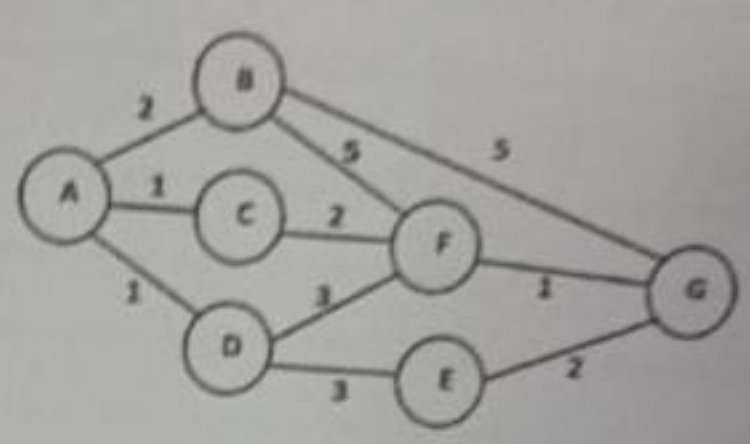


2- Find Optimal Path and cost using  $A^*$  algorithm

[2Marks]

If Start node is A, goal node is G and heuristic distances are given in the table

Straight line distance to G	
A	6
B	5
C	3
D	3
E	2
F	1



Handwritten area with horizontal dashed lines for writing the solution.

A* algorithm is.....			
a	optimal	b	complete
c	not optimal	d	a and b

8 In Hill Climbing search.....			
a	Backtracking is permitted.	b	The globally best node is always chosen
c	combination of depth first and breadth first searches are used	d	terminates when a peak is reached

9 .....takes the facts of the problem and applies the rules or legal moves to produce new facts that lead to a goal.			
a	Goal Driven search	b	Backward chaining.
c	a and b	d	Data Driven search

10 If given event A is 7 elements and event B is 3 elements, and $P(B A)$ is 0.2 then $P(A B)$ is:			
a	$(0.2 \times 0.7) / 0.3$	b	$(0.2 \times 0.3) / 0.7$
c	$0.2 / 0.7$	d	$0.3 / 0.7$

11 In how many ways can 3 balls out of a group of 16 balls be chosen? (Repetition allowed, order doesn't matter)			
a	$16! / 13!$	b	$16!$
c	$18! / (3! \cdot 15!)$	d	$3!$

12 In the following semantic Network, which sentence is not true?

```

graph TD
    Animals -- can --> walk
    Animals -- have --> legs
    bets -- are --> Animals
    dog -- is a --> bets
    cat -- is a --> bets
    dog -- is --> red
    dog -- can --> sing
    cat -- cannot --> sing
  
```

a	A dog is a bet and is red	b	A dog can sing, but a cat cannot
c	bets are animals and can sing	d	Animals can walk and have legs