**Exam 2009**

**Q1)**

**A)**

|  |  |  |
| --- | --- | --- |
| **Search Strategy** | **Informed Search** | **Uninformed Search** |
| **Techniques** | Greedy, A\*, Hill Climbing | DFS, BFS, Uniform Cost |
| **Advantages** | -Add Specific Information to select what is the best path.  -find a solution more quickly  -find solutions even when there is limited time available. | -useful in problems that have not any additional information provided in problem definition |
| **Disadvantages** | -can fail to find any solution because heuristic based on experience. | -take a lot of time in search |
| **Others** | Use heuristic function that estimates the "goodness" of a node (n) with respect to reaching a goal | -just depend on defined cost for egdes or 0 cost |

**B)**

|  |  |  |
| --- | --- | --- |
| **KR** | **Semantic network** | **Frames** |
| **Knowledge is represented in form** | -Graphical Representation  -Concept represent as Node  -Relationship represent as arc | Object oriented with  -Frame identification  -Slots and slots values  -Relationships between frames |
| **Inference Mechanism** | Inheritance, Intersection search | Inheritance , Multiple Inheritance |
| **Advantage** | Used in semantic association and physical structure | Allow more convenient pakaging of facts about objects |
| **Others** |  |  |

**Q2) True, False**

1-F 🡪 cost may be not uniform (msh mota2kadeen)

2-F 🡪 can stuck in local maxima

3-T

4-T

5-T

**B) Complete**

1- Uniform cost

2- Informed

3- Utility function

4-msh 3alana w allah a3lam

5- msh 3alana w allah a3lam

**b)**

1-Local Maxima: point that is better state than surrounding states but not the goal

2-Recognize-act cycle: msh 3alana w allah a3lam

**Q2) **

**b)**

1- Q

2- ! T

3- P v R

4- ! Q v S

5- !R v !S v T

**Resolution**

(1 with 4)🡪 S **(6)**

(6 with 5)🡪 ! R v T **(7)**

(7 with 2)🡪 ! R **(8)**

(8 with 3) 🡪 P

**Resoultion by Contradiction**

6- ! Goal🡪 ! P

(1 with 4)🡪 S **(7)**

(7 with 5)🡪 ! R v T **(8)**

(8 with 2)🡪 ! R **(9)**

(9 with 3) 🡪 P **(10)**

(10 with 6) 🡪 NIL

**c)** msh 3alana w allah a3lam

**Q4)**

**A)**

**The move is 2**

**B)**

**1-Uniform Cost**

Open List closed List

{S} {}

S {A(2) , B(3) } {S}

A { B(3),D(3),C(7),G1(14)} {S,A}

B { D(3),E(4),C(7),H(7),G1(14),F(15) } {S,A,B}

D { E(4),C(7),H(7),G1(14),F(15)} {S,A,B,D}

E { C(7),H(7),G2(10),K(12),G1(14),F(15)} {S,A,B,D,E}

C { H(7),G2(10),K(12),G1(14),F(15),J(15),I(17)} {S,A,B,D,E,C}

H { G2(10),G3(10),K(12),G1(14),F(15),J(15),I(17)} {S,A,B,D,E,C,H}

G2 {G3(10),K(12),G1(14),F(15),J(15),I(17)} {S,A,B,D,E,C,H,G2}

G3 {K(12),G1(14),F(15),J(15),I(17)} {S,A,B,D,E,C,H,G2,G3}

K {G1(14),F(15),J(15),I(17)} {S,A,B,D,E,C,H,G2,G3,K}

G1 {F(15),J(15),I(17)} {S,A,B,D,E,C,H,G2,G3,K,G1}

**2-Greedy**

Open List closed List

{S} {}

S {B(6) , A(10) } {S}

B { F(3),H(3),E(5), A(10) } {S,B}

F {H(3) , E(5) , A(10) } {S,B,F}

H {G3(0),E(5) , A(10) } {S,B,F,H}

G3 {E(5), A(10) } {S,B,F,H,G3}

E {G2(0),K(1),A(10)} {S,B,F,H,G3,E}

G2 {K(1),A(10)} {S,B,F,H,G3,E,G2}

K {A(10)} { S,B,F,H,G3,E,G2,K}

A {G1(0),D(3),C(5)} { S,B,F,H,G3,E,G2,K,A}

G1 {D(3),C(5)} { S,B,F,H,G3,E,G2,K,A,G1}

**3) A\***

Open List closed List

{S} {}

S {B(9) , A(12) } {S}

B { E(9) , A (12), H(10),F(18) } {S,B}

E { G2(10),A (12),K(13), H(10),F(18) } {S,A,E}

G2 { A (12),K(13), H(10),F(18) } { S,A,E ,G2}

A { D(6), H(10),C(12),K(13),G1(14) ,F(18) } { S,A,E ,G2,A}

D { H(10),C(12),K(13),G1(14) ,F(18) } { S,A,E ,G2,A, D}

H { G3(11),C(12),K(13),G1(14) ,F(18) } { S,A,E ,G2,A, D ,H}

G3 { C(12),K(13),G1(14) ,F(18) } { S,A,E ,G2,A, D ,H,G3}

C { K(13),G1(14) ,F(18),I(19),J(19) } { S,A,E ,G2,A, D ,H,G3,C}

K { G1(14) ,F(18),I(19),J(19) } { S,A,E ,G2,A, D ,H,G3,C,K}

G1 { F(18),I(19),J(19) } { S,A,E ,G2,A, D ,H,G3,C,K,G1}