Name: Enrolment No:	UPES

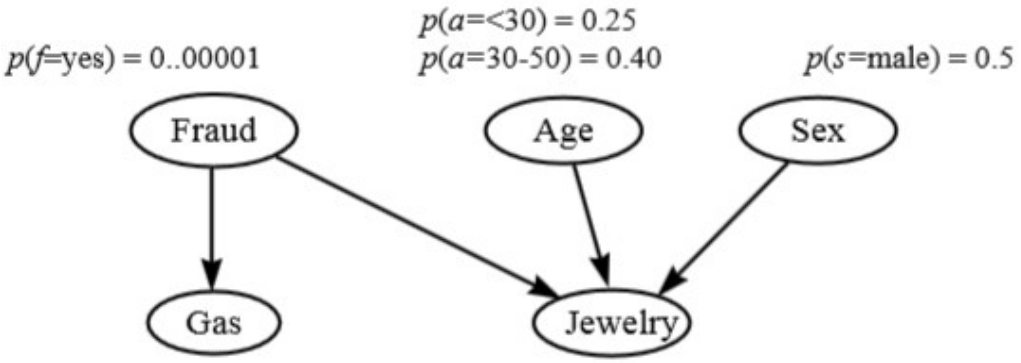
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

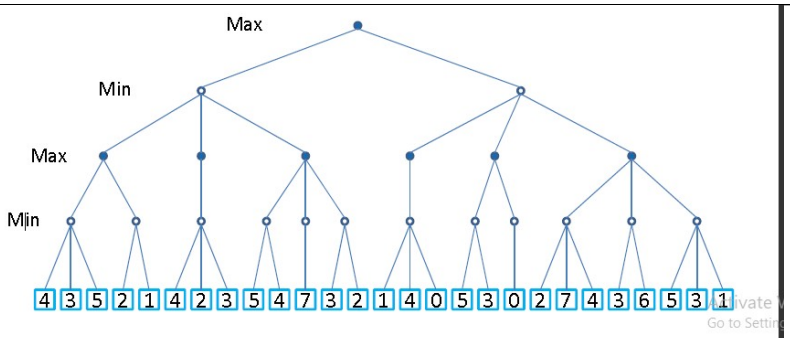
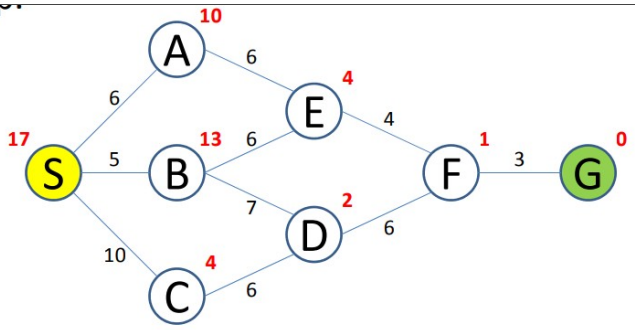
Mid Semester Examination, May 2019

Programme Name: B.Tech-Mechatronics **Semester : 8th**
Course Name : Artificial Intelligence **Time : 02 hrs**
Course Code : ELEG 442 **Max. Marks : 100**
Nos. of page(s) : 02
Instructions:

SECTION A (Attempt all 5 Questions)-20 Marks

S. No.		Marks	CO
Q 1.	Differentiate between breadth first and depth first search	4	CO2
Q 2.	Define the terms Current space and State Space in Hill Climbing	4	CO2
Q 3.	Write a program in LISP to demonstrate the iterative concept.	4	CO1
Q 4.	Discuss any one real life AI application in the field of mechatronics.	4	CO3
Q 5.	Explain De Morgan's law.	4	CO3
	SECTION B -40 Marks		
Q 6.	What are three possible scenarios when one might turn to use EM (Expectation Maximization)	10	CO3
Q 7.	A horse that is registered for today's race is not a thoroughbred. Every horse registered for today's race has won a race this year. Therefore a horse that has won a race this year is not a thoroughbred. Represent in the Knowledge form.	10	CO2
Q 8.	$\neg\forall xP(x) \equiv \exists x \neg P(x)$ $\neg\exists xP(x) \equiv \forall x \neg P(x)$ $\forall xP(x) \wedge \forall xQ(x) \equiv \forall x(P(x) \wedge Q(x))$ $\exists x(P(x) \vee Q(x)) \equiv \exists xP(x) \vee \exists xQ(x)$ Explain the knowledge representation.	10	CO5
Q 9.	Explain Prior Posterior and likelihood with suitable example.	10	CO1
	OR		
Q 9.	Differentiate between Frequentist approach and Bayesian approach with suitable example.	10	CO3
	SECTION-C-40 Marks		

Q 10.	 p(g=yes|f=yes) = 0.2 p(g=yes|f=no) = 0.01 p(j=yes|f=yes,a=*,s=*) = 0.05 p(j=yes|f=no,a=<30,s=male) = 0..0001 p(j=yes|f=no,a=30-50,s=male) = 0.0004 p(j=yes|f=no,a=>50,s=male) = 0.0002 p(j=yes|f=no,a=<30,s=female) = 0..0005 p(j=yes|f=no,a=30-50,s=female) = 0.002 p(j=yes|f=no,a=>50,s=female) = 0.001 Design the Bayes network for the given data. Make suitable assumptions wherever required.	**20**	**CO3**

Q 11.	 Execute minimax algorithm on given figure without alpha beta pruning.		**20**	**CO5**
	OR			
Q 11.	 Perform A* algorithm on given figure, Write down queue generated at each step.		**20**	**CO5**

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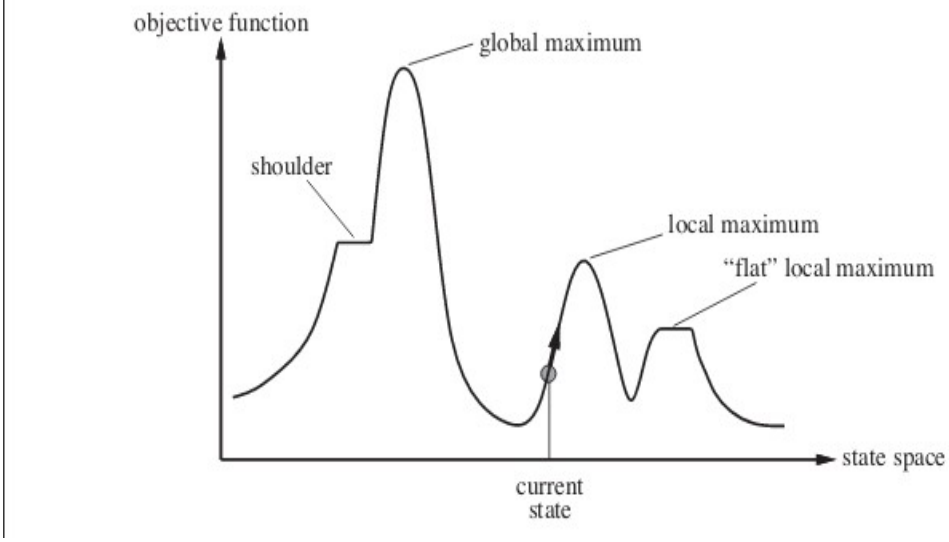
SECTION A (Attempt all 5 Questions)-20 Marks

S. No.		Marks	CO
Q 1.	Differentiate between forward and backward chaining.	4	CO2
Q 2.	Define the terms shoulder and global maximum in Hill Climbing algorithm.	4	CO2
Q 3.	Write a program in LISP to demonstrate recursive concept.	4	CO1
Q 4.	Discuss any one real life AI application in the field of bioinformatics.	4	CO3
Q 5.	Discuss AND OR Graph.	4	CO3
	SECTION B -40 Marks		
Q 6.	What are three possible scenarios when one might turn to use EM (Expectation Maximization)	10	CO4
Q 7.	 Explain the terms in given figure.	10	CO3
Q 8.	Explain the laws of Equivalence for quatifiers.	10	CO2
Q 9.	Discuss Skolemnisation concept with suitable example	10	CO5
	OR		

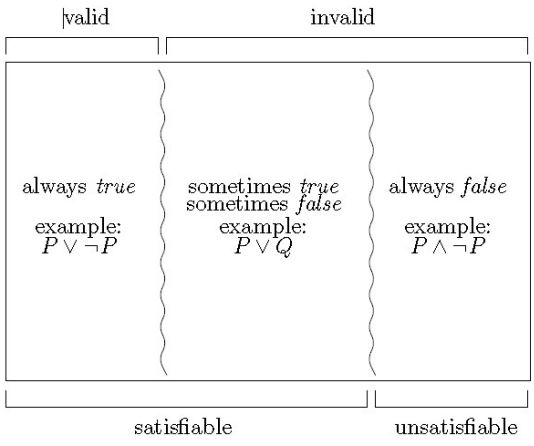
Q 9.	Discuss Horn's Clause with suitable example	**10**	**CO5**
	SECTION-C-40 Marks		
Q 10.		**20**	**CO3**

Outlook	Temperature	Humidity	Windy	Class
sunny	hot	high	false	N
sunny	hot	high	true	N
overcast	hot	high	false	P
rain	mild	high	false	P
rain	cool	normal	false	P
rain	cool	normal	true	N
overcast	cool	normal	true	P
sunny	mild	high	false	N
sunny	cool	normal	false	P
rain	mild	normal	false	P
sunny	mild	normal	true	P
overcast	mild	high	true	P
overcast	hot	normal	false	P

For the above data:

1.Find out the probability of Play and Not Play

2. outlook = sunny
temperature = cool
humidity = high
windy = false
for the given values find out the probability to fall in category of play or not play.

Q 11.	 Justify the given figure with suitable examples and with support of propositional logic	**20**	**C04**
	OR		

Q 11.	Discuss 1.Recursive transition NETS 2.Augmented Transition NETS 3.Certianity Factor 4.Constraint Specification Problem Game	**20**	**CO4**