Q2 (a) Differentiate between symbolic and non symbolic representation.

Answer Page Number 4-5 of Textbook

Q2 (b) In context to objects to Turing test, briefly discuss Chinese Room Test.

Answer Page Number 7-8 of Textbook

Q2 (c) Explain why Artificial intelligence is beneficial even though computers cannot really think.

Answer Page Number 13-14 of Textbook

Q3 (a) Consider the following
p: Today is Tuesday
q : It is raining
r: It is cold
write in simple sentences the meaning of the following:

(i) $\mathbf{p \Rightarrow q}$
(ii) $\mathbf{\sim q \Rightarrow (r \wedge p)}$
(iii) $\mathbf{\sim p \Rightarrow (q \vee r)}$
(iv) $\mathbf{(p \vee q) \Leftrightarrow r}$

Answer

a) if no day is Tuesday, then it is training
b) if it is not raining , then it is cold and today is Tuesday
c) If today is not Tuesday, then it is raining or it is cold
d) It is not the case that today is Tuesday or it is raining only if it is cold

Q3 (b) Obtain the principal disjunctive normal norm of: $(p \wedge \sim q \wedge \sim r) \vee (q \wedge r)$

Answer $(p\wedge\sim q\wedge\sim r)$ is already a number

Now $(q\wedge r) = (q\wedge r\wedge p)\ V\ (q\wedge r\wedge\sim p)$

$= (p\wedge q\wedge r)\ V\ (\sim p\wedge q\wedge r)$

So the required is $(p\wedge q\wedge r)\ V\ (p\wedge q\wedge r) V (\sim p\wedge q\wedge r)$

Q3 (c) Prove the validity of the following argument "If I get the job and work hard, then I will get promoted"
If I get promoted, then I will be happy
I will not be happy, therefore, either I will not get the job or I will not work hard"

Answer

let p: I get the job
Q: I work hard
R: I get remoted
S: I will be happy

Then the above argument can be written in symbol large as $(p \wedge q) = r$

$R = s$

$\sim s$

so 1,$(p \wedge q)=r$
2,$r=s$
3,$(p \wedge q)=s$
4,$\sim s$
5,$\sim(p \wedge q)$
6,$\sim pV \sim q$
hence the argument is valued

Q4 (a) Draw semantic network to represent the following data:

(i) Tom is a cat
(ii) Tom caught a bird
(iii) Tom is owned by John
(iv) Tom is ginger in colour
(v) Cats like cream
(vi) The cat sat on the mat
(vii) A cat is a mammal
(viii) A bird is an animal
(ix) All mammals are animals
(x) Mammals have fur

Answer Page Number 61 of Textbook

Q4 (b)Explain with the help of diagram the procedure for knowledge acquisition.

Answer Page Number 53-54 of Textbook

Q5 (a) Solve the problem;

In a certain clinic 0.15 of the patients have got the HIV virus. Suppose a blood test is carried out on a patient. If the patient has got the virus the test will turn out positive with probability 0.95. If the patient does not have the virus the test will turn out positive with probability 0.02. If the test is positive what are the probabilities that the patient

(i) has the virus
(ii) does not have the virus?

If the test is negative what are the probabilities that the patient

(iii) has the virus
(iv) does not have the virus.

Answer

lets gave the event the table
H= the patient has got the virus
P= the outcome of the test is positive

From gueshan p(H)=0.15,p(p/H)=0.95, p(p/H)=0.02
We have to find out
(a) p(H/p) b) p(H/p) c) p(H/p) d)p(H/P)

using types theoram
p(H/p)=p(P/H)p(h)/p(p)
but p(p/H) & p(H) only given & p(p) is not given .

so p(p)=p(H∧p)+p(H∧p)
p(H∧p)=p(p/H)p(H)
p(H∧p)=p(p/H)p(H)
so p(p)= p(p/H)p(H)+p(p/H).p(H)
0.95*0.15+0.02*0.85
=0.1595

putting in form = so p(H/p)= (p/H)p(H)/(p/H)(p/H)+p(p/H).p(H)

=0.95*0.15/0.1595
=0.8934

(b) p(H/p)=1-p(H/p)=1-p(H/p)=1-0.8934=0.1066
(c) p(H/p)=p(p/H)p(H)/p(p)

=0.05*0.15/1-0.1595=0.008923

(d) p(H/p)= 1-p(H/p)=1-0.008923=0.99107

Q5 (b) Write short notes on;
(i) Domain Modelling
(ii) Frame based System

Answer
(i) Page Number 82 of Textbook
(ii) Page Number 88 of Textbook

Q6 (a) Explain the MINIMAX search procedure.

Answer Page Number 139 of Textbook

Q6 (b) Differentiate between Depth First Search and Breadth First Search algorithms. Illustrate them with suitable example.

Answer Page Number 122-126 of Textbook

Q7 (a) Differentiate between:
(i) Public Vs Private Knowledge
(ii) Skill Vs Knowledge
(iii) Human Vs Machine Intelligence

Answer
(i) Page Number 183 of Textbook
(ii) Page Number 183-184 of Textbook
(iii) Page Number 212 of Textbook

Q7 (b) Explain and contrast between inference Procedure in Predicate and Propositional calculus.

Answer Page Number 191 of Textbook

Q8 (a) Explain the Key features of Hop field Neural Networks.

Answer Page Number 220 of Textbook

Q8 (b) Compare and contrast between Neural Networks and Expert systems in terms of knowledge representation, acquisition and explanation.

Answer Page Number 231 of Textbook

Q8 (c) Discuss the limitation of Neural Networks.

Answer Page Number 231of Textbook

Q9 (a) Discuss the use of Artificial intelligence techniques in E-Commerce applications.

Answer Page Number 268-278 of Textbook

Q9 (b) Explain about the various uses of Artificial Intelligence in Medicine field. Justify it with proper examples.

Answer Page Number 286-288 of Textbook

Text Book

Introduction to Artificial Intelligence, Rajendra Akerkar, PHI, 2005