DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH – SEMESTER – VII, IT
SUBJECT: (IT 714) KNOWLEDGE SYSTEMS

Examination	**: Second Sessional**	**Seat No.**	**:**
Date	**: 10/09/2016**	**Day**	**: Saturday**
Time	**: 2.15 To 3:30 PM**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 **Do as directed**.

(a) Covert following sentence into clause form (Wff). [2]
"All Romans who know Marcus either hate Caesar or think that everyone who hates anyone is crazy "

(b) Represent Following simple Facts using predicate Logic. [2]
1. Some politician is crooked
2. No politician is crooked
3. Not all politicians are crooked
4. Every politician is crooked

(c) Write a prolog code which prints "Hello" 10 times and terminates. [2]

(d) Which proposition from the given is tautology, contradiction or neither. [2]
1. $p \vee \neg(p \wedge q)$ 2. $(p \rightarrow q) \wedge (q \rightarrow p)$

(e) Explain use of cut predicate with example. [2]

(f) Which of the following is **NOT** equivalent to $\neg\exists x(\forall y(\alpha) \wedge \forall z(\beta))$? Justify [2]
(A) $\forall x(\exists z(\neg\beta) \rightarrow \forall y(\alpha))$ (B) $\forall x(\forall z(\beta) \rightarrow \exists y(\neg\alpha))$
(C) $\forall x(\forall y(\alpha) \rightarrow \exists z(\neg\beta))$ (D) $\forall x(\exists y(\neg\alpha) \rightarrow \exists z(\neg\beta))$

Q.2 Attempt **Any Two** from the following questions.

(a) You are planning a party, but your friends are a bit touchy about who will be there. [6]
1. If John comes, he will get very hostile if Sarah is there.
2. Sarah will only come if Kim will be there also.
3. Kim says she will not come unless John does.
Who can you invite without making someone unhappy?
Solve the puzzle using propositional logic. Give the conclusion.

(b) There are 100 employees in XYZ company. Employees earning more than 5000 pay tax. Sandip is a manager in XYZ company. Rohit is a worker in XYZ company. Manager earns Rs 10000. Workers earn Rs 4000. [6]
Convert the facts in predicate form and prove by resolution :
1. "Sandip pays tax" 2. "Rohit does not pay tax"

(c) Solve the given cryptarithmatic problem. [6]

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  W O R L D
+ T R A D E
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C E N T E R
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Q.3 Attempt ***ALL*** from the following questions.

(a) A simple version of the NIM game is played as follows: Two players alternate in removing stones from three piles initially containing one, two, and three stones, respectively. The player who picks up the last stone wins. At any given turn a player can pick one or more stones from a single pile; at least one stone has to be picked every time. [8]

a) Show, by drawing a game tree, which player can always win.
b) Is it necessary to generate the whole tree to find a winning strategy? Explain why or why not.

(b) Write predicate fact (n) ,which finds and display factorial of a given Number. Show one iteration of the code to explain. [4]

OR

Q.3 Attempt ***ALL*** from the following questions.

(a) Apply alpha beta pruning on given tree in fig. 1. Clearly show alpha and beta cut. Also maintain values of alpha and beta. [6]

(b) Explain forward chaining and backward chaining using example. Also describe their advantages and disadvantages. Take one example and apply forward backward chaining. [6]

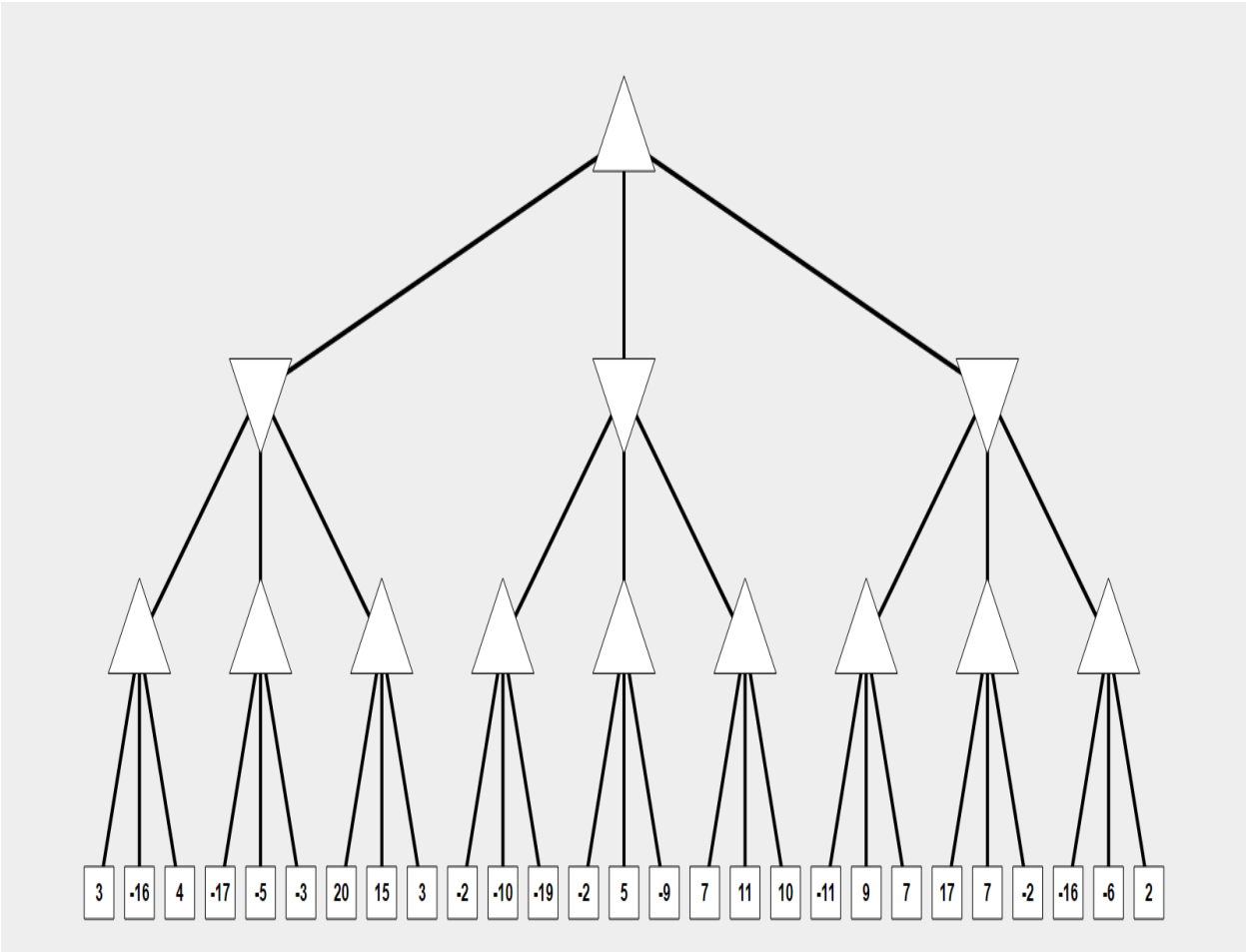

Figure 1