

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY  
FACULTY OF APPLIED SCIENCE  
COMPUTER SCIENCE DEPARTMENT  
JULY SUPPLEMENTARY EXAMINATIONS 2005**

**SUBJECT:** EXPERT SYSTEMS AND DSS  
**CODE:** SCS4211

**INSTRUCTION TO CANDIDATES**

This paper consists of **SIX** questions. Chose any **FOUR** questions.

**Time: 3 hours**

**QUESTION ONE**

- a) What are expert systems? Draw a figure, and describe the components of an Expert System (ES) and their relationships. [10]
- b) Why did the General-purpose Problem Solver fail? [5]
- c) Discuss the factors that have slowed down the commercial spread of ES. [10]

**QUESTION TWO**

- a) Relate meta-knowledge to meta-rules. Explain how meta-rules work. [5]
- b) Discuss what you understand by protocol analysis [5]
- c) Explain how conflict resolution is used in a rule-based system. [5]
- d) Using an example explain what is deductive reasoning. [4]
- e) Compare and contrast the concepts of forward chaining and backward chaining [6]

**QUESTION THREE**

Briefly discuss the advantages and disadvantages of predicate logic and frames as a knowledge representation language. Your answer should include a brief discussion of the sorts of knowledge each is good (or bad) at representing." [15]

- a).Discuss the major deficiencies of existing explanation facilities. Organize your discussion as a comparison with potential explanation given by a human. [10]

**QUESTION FOUR**

- a) Knowledge acquisition has been described as the 'bottle neck' towards building an expert system. Discuss this assertion in detail. [14]
- b) The best-first method is described as '**greedy**'. Explain why. Relate three factors that distinguish an expert system from a more conventional applications program. [6]

**QUESTION FIVE**

- a) Discuss the major advantages of using Expert systems. [10]
- b) Development and consultation are two of the three major activities that are part of ES construction and use. Discuss the two activities. [10]
- c) Explain how software packages EMYCIN and MYCIN are related. [5]

**QUESTION SIX**

- a) What do you understand by the term '**meta -knowledge**'? [1]
- b) Compare and Contrast Hill-Climbing and Depth-first search. [8]
- c) What are the limitations of present day ES? [16]

**END OF QUESTION PAPER**