COURSE CODE: CIT 474
COURSE TITLE: INTRODUCTION TO EXPERT SYSTEMS
CREDIT: 2 UNITS
TIME ALLOWED: 2 HOURS
INSTRUCTION: ANSWER QUESTION ONE (1) AND ANY OTHER TWO (2) QUESTIONS.

Question 1

1a. List three (3) schemes for knowledge representation in Expert Systems [3 marks]

1b. Mention five (5) properties that enhance production rule as the most popular type of knowledge representation in Expert system [5 marks]

1c. Highlight Ten (10) application areas of Expert System in Accounting and Finance [10 marks]

1d. Write and illustrate three (3) production rules that could guide the control of traffic light at a 4-way road junction. [12 marks]

Question 2

2a. Briefly explain five (5) major uses of Frames in Expert System development [10 marks]

2b. Summarize in five (5) sentences the operations of Inference Engine. [10 marks]

Question 3

3a. Explain in four (4) sentences the Interactive Environment provided by CLIPS language in Expert System development [8 marks]

3b. Discuss speech synthesis in three (3) sentences and assess three (3) areas of its application. [12 marks]

Question 4

4a. Briefly explain the reason for referring to Blackboard as global database in Expert system [4 marks]

4b. Discuss the flexibility of configuration in blackboard architecture [4 marks]

4c. Categorize the antecedent and the consequent parts in the following production rules [12 marks]

Rule 1: IF Inlet pressure is very high AND flowrate is very low THEN leakage is very high
Rule 2: IF Inlet pressure is normal AND flowrate is normal THEN leakage is Nil
Rule 3: IF Inlet pressure is high AND flowrate is low THEN leakage is low
Rule 4: IF Inlet pressure is very low OR flowrate is very low THEN leakage is very low

Question 5

5a. Contrast Concatenated synthesis and Formant Synthesis in a text-to-speech system. [4 marks]

5b. Discuss the Explanation Facility of a rule-based expert system [4 marks]

5c. Identify and briefly explain three (3) components of a blackboard system [12 marks]