KIBABII UNIVERSITY
SCHOOL OF COMPUTING AND INFORMATICS
DEPARTMENT OF COMPUTER SCIENCE
CSC 227 LOGIC PROGRAMMING II CAT II [TAKE AWAY][X/40] 2023
REGNO. : _____ NAME: _____

a. First Order Predicate Calculus is the basis of almost all knowledge representation and reasoning in every area of symbolic Artificial Intelligence (AI). Give at least four area of AI where this can be applied. **[4 marks]**

b. Explain how lists are handled in prolog **[2 marks]**

c. Write a prolog program or database of facts and rules using your own test data that:

i. Concatenate two lists **[2 marks]**

ii. Find the total cost of list of items **[3 marks]**

iii. That reverse the elements of a list. **[3 marks]**

d. By differentiating between tail recursion and non-tail recursion, explain how recursion is handled in prolog programs. **[3 marks]**

e. Discuss briefly any **FOUR** types of reasoning systems as used in logic programming. **[4 marks]**

f. Define and test predicates which takes three integer arguments and calculates and outputs the following values: **[2 marks]**

i. Their sum and product

ii. The largest number **[2 marks]**

g. You are provided with the information lung diseases. Study it and answer the questions that follow:

- **Tuberculosis** is a lung disease whose symptoms are persistant cough, constant fatigue, weight loss, loss of appetite, fever, coughing up blood, night sweats.
- **Pneumonia** is a disease whose symptoms are cough, fever, shaking chills, shortness of breath.
- **Byssinosis** is a disease whose symptoms are chest tightness, cough, wheezing.
- **Pertusis** is a disease whose symptoms are runny nose and mild fever.
- **Pneumoconiosis** is a disease whose symptoms are chronic cough and shortness of breath.

i Write the prolog facts and rules that will store the above diseases and their respective symptoms in the knowledge base. **[5 marks]**

ii Write down a prolog query that will return the Symptoms for all the diseases. **[2 marks]**

iii Explain how prolog compiler arrives at the solution of the (ii) query above. **[2 marks]**

iv Explain how you will utilize the tokens **(!.)** and **(nl.)** in the program written in (i) above. **[2 marks]**

h. Explain any **TWO** inbuilt prolog functions or predicates with appropriate illustrations **[4 marks]**