NATIONAL OPEN UNIVERSITY OF NIGERIA

PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI – ABUJA

FACULTY OF SCIENCES

DEPARTMENT OF COMPUTER SCIENCE

2023_2 EXAMINATIONS_

COURSE CODE: CIT 474
COURSE TITLE: INTRODUCTION TO EXPERT SYSTEMS
COURSE CREDIT: 2 UNITS
TIME ALLOWED: 2 HOURS
INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER THREE (3) QUESTIONS

QUESTIONS

QUESTION 1

1a. Describe the procedure for designing and building a rule editor. ***(6 marks)***

b. Indicate the year each of the following was invented. ***(5 marks)***

i. Rete algorithm
ii. SMP
iii. CLIPS
iv. OPS.
v. Frames

c. Categorize the following into **"ADVANTAGE" or "DISADVANTAGE"** of expert system:

(i) Degradation (ii) Timeliness (iii) Creativity (iv) Learning (v)Scope ***(5 marks)***

d. State two (2) issues that must be considered when building a natural interface for an expert system? ***(4 marks)***

e. Name five **(5)** distinguishing characteristics of programming languages needed for expert systems applications. ***(5 marks)***

QUESTION 2

2a. Outline and elucidate five (5) components of Expert System ***(10 marks)***

b. Write an overview of a Knowledge Engineering Environment **(KEE). (5 marks).**

QUESTION 3

estion **3a:** While in third-world, underdeveloped and developing countries population explosion is becoming and major challenge, in many developed countries the figure of birthrates has been falling steadily over a long period of time for a number of reasons. What are these reasons? **(10 Marks)**

***Question* 3b:** For so many reasons coming together in business might one day require a pulling apart. Whatever has a commencement will surely have an ending. When people come together to pull resources together in partnership, one day they will be a dessolution. What are the possible reasons for Dissolution of Partnership? **(10 Marks)**

Question* 4a:** In all forms of businesses, there are features, types, characteristics and forms distinguishing one from the other. What are those things that can be termed as the Features of a Sole proprietorship/Ownership? ***(10 Marks)

***Question* 4b:** Despite all the various efforts of the government over many years of interventions, institutional support funding has remained one of the biggest challenges of an average Nigerian Entrepreneur or Sole Proprietor is funding hence the Sole Proprietor seeks alternate means. What is the alternative Sources of Funds of a Sole proprietor? **(10 Marks)**

(Wishing you all the very best)

photocopying for each customer is assumed to be exponentially distributed with a mean of 4 minutes

(i). Determine the probability that a customer arriving at the centre will have to wait [2 marks]

(ii). Find the average queue length that is formed from time to time [2 marks]

(iii). The photocopying company will install second centre when convinced that an arrival would expect to have to wait at least 5 minutes for the photocopying. Find the increase in flows of arrivals which will justify a second centre. [3 marks]

(iv). What is the probability that a customer will have to wait for more than 15 minutes before the photocopying ? [2 marks]

(v). Find the fraction of a day that the photocopier will be in use. [1 mark]

(b)Analyse the reasons for replacing equipment (5 marks)

4(a) Demonstrate a flow that shows the steps involved in operation research [5 marks]

(b) A metal alloy used in the manufacture of rifles uses two ingredients A and B. A total of 120 units of alloy are used for production. Not more than 60 units of A can be used and at least 40 units of ingredient B must be used in the alloy. Ingredient A costs Rs. 4 per unit and ingredient B costs Rs. 6 per unit. The company manufacturing rifles is keen to minimise its costs. Formulate a mathematical model for the problem and state the constraints to the solution. (10 marks)

5 (a) Analyse the weakness of operation research [5 marks]

(b) Assuming a company found out that it isnot importing its raw materials in the most economic way. Afinancial analysis shows that:
It cost #900.00 to make an order.Each item costs #50.50 .The annual holding costs are 10 per cent of the price paid.The current annual consumption is 500,000.00
Determine the following:
i. The optimal order size.
ii. The number of days this supply would last.
iii. The number of orders per year? (Assume year = 250 working days) (10 marks)