4E1301

Roll No. _____ [Total No. of Pages : 3

4E1301

B.Tech. IV Sem. (Main/Back) Examination, July - 2023
Artificial Intelligence and Data Science
4AID2-01 Discrete Mathematics Structure
CS, IT, AID, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (As Mentioned in form No. 205).

PART - A
(Word limit 25)

All questions are compulsory. **(10×2=20)**

1. Prove that $A-B=B'\cap A'$. (2)
2. Define partial ordering relation with an example. (2)
3. Draw the truth table for $p\wedge q\rightarrow p\vee q$. (2)
4. Explain conjuctive normal form. (2)
5. Draw the Hasse diagram of the poset $(A,\leq)$ where A = {1,2,3,4,12} and the partial order of divisibility on A is $a\leq b$ (i.e. if a divides b). (2)
6. 8 boys and 5 girls constitute a group. In how many ways seven of them can be selected if the selections always have atleast 3 boys and 2 girls. (2)
7. If a,b are any elements of a group G, then prove that $(ab)^{-1}=b^{-1}a^{-1}$. (2)
8. If a is a generator of a cyclic group, then prove that a^{-1} is also its generator. (2)
9. Draw graph which is
   a. Eulerian but not Hamiltonian.
   b. Hamiltonian but not Eulerian. (2)
10. Define chromatic number. (2)

PART - B

(Word limit 100)

Attempt any Five questions. **(5×4=20)**

1. In a class of 60 students, 25 study Hindi, 26 study English and 26 study Sanskrit. Also 9 study both Hindi and Sanskrit, 11 study hindi and english and 8 study Englishh and Sanskrit. If 8 study none of the three subjects, Find number of students who study exactly one subject. **(4)**

2. Using principle of mathematical induction, prove that $1+2+2^2+.....+2^{n-1}=2^n-1$. **(4)**

3. Draw the transition diagram of finite state machine represented by following state table. Also find output word corresponding to input word w = 11011011. **(4)**

State	Transition function		Output function	
	0	1	0	1
s_0	s_3	s_1	0	1
s_1	s_0	s_1	0	1
s_2	s_3	s_1	0	1
s_3	s_1	s_3	0	0

4. Solve the recurrence relation

   $a_r - 4a_{r-1} + 4a_{r-2} = 0$; $a_0 = 1$, $a_1 = 3$. **(4)**

5. Define isomorphism of groups. Prove that every subgroup of an abelian group is normal. **(4)**

6. Prove that the sum of degrees of all the vertices in a graph is equal to twice the number of edges in the graph. **(4)**

7. Prove that set of real numbers of the form $a+b\sqrt{2}$ (where a and b are integers) with ordinary addition and multiplication forms a ring. **(4)**

PART - C

Attempt any Three questions. **(3×10=30)**

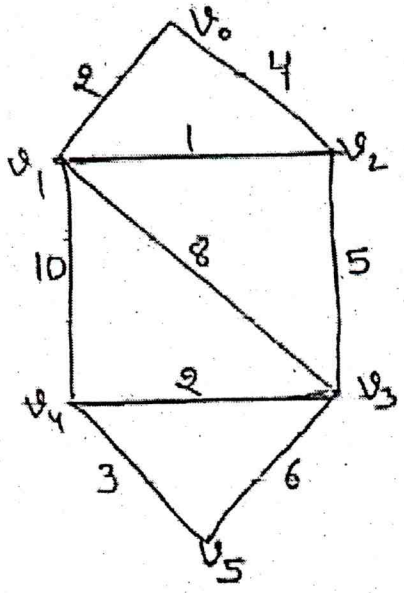
1. In the set Z of integers, a relation R is defined by $aRb \Leftrightarrow a \equiv b(\text{mod } 4)$. Show that R is an equivalence relation. **(10)**

2. Define universal and existential quantifiers. prove that $p \rightarrow (q \wedge r) \equiv (p \rightarrow q) \wedge (p \rightarrow r)$. **(10)**

3. Prove that the dual of a lattice is also a lattice. **(10)**

4. Prove that the necessary and sufficient conditions for a non - void subset H of a group G to be a subgroup is that $a \in H, b \in H \Rightarrow ab^{-1} \in H$. **(10)**

5. Find the shortest path between the vertices v_0 and v_5 in the following weighed graph. **(10)**



4E1302

Roll No. _____ [Total No. of Pages : 2

CS/AI/DS

4E1302

B.Tech. IV Sem. (Main/Back) Examination, July - 2023

4AE1-03/ Managerial Economics and Financial Accounting / All branches

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer Should be given up to 25 Words only)

All questions are compulsory. **(10×2=20)**

1. Describe the principle of economics.
2. Discuss the word national income.
3. Define Monopolistic competition.
4. What is the importance of balance sheet.
5. Describe an Isoquant?
6. What is fund flow analysis?
7. What do you understand by scale of production?
8. Describe demand function.
9. Explain law of supply.
10. Define managerial economics.

PART - B

(Analytical/Problem Solving questions)

Attempt any Five questions. **(5×4=20)**

1. Differentiate between NI, GNP and GDP.
2. Discuss in detail on scarcity and choice.

3. List out the various types of price elasticity of demand and explain them.
4. How do total product, average product and marginal product change due to change in the use of one input and keeping other input constant?
5. Differentiate between explicit and Implicit cost.
6. Discuss in detail the features of monopoly market with its price curve.
7. Interpret the use of balance sheet highlight it with example.

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any Three questions. **(3×10=30)**

1. Explain circular flow of 3 sector economy model.
2. Discuss elasticity of demand, also explain types of elasticity of demand with graphs.
3. Describe in detail :
   a. Law of variable proportions.
   b. Laws of returns to scale.
4. The following figures relates to trading activities of shipra Ltd for the year 31st March 2023 :

	Rs.		Rs.
Sales	10,00,000	Administrative expenses :	
Purchases	7,00,000	Salaries	30,000
Closing stock	1,40,000	Rent	6,000
Opening stock	1,10,000	Stationery and postage	2,000
Sales return	40,000	Depriciation	10,000
Selling and distribution expenses :		Other charges	20,000
Salaries	18,000	Provision for taxation	70,000
Advertising	7,000	Non operating income :	
Travelling	5,000	Dividend received	18,000
		Non operating expenses :	
		Loss on sale of shares	3,000

   Prepare statement of profit and loss under as per part II of schedule II of companies act, 2015.
5. Discuss balance sheet and its importance with a suitable example.

4E1303

Roll No. _____ [Total No. of Pages : 4

4E1303

B.Tech. IV Sem. (Main/Back) Examination, July - 2023

4AE1-02 Technical Communication/All branches

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Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. Mention two objectives of Technical communication.
2. What do you understand by the term **"Technical Document"**.
3. Define the term **"Technical Discourse"**?
4. Name different types of **"Technical Reports"**?
5. Distinguish between **Technical and non - Technical communication.**
6. Suggest two methods of enhancing **Listening communication skills.**
7. Mention any two ways for improving **Linguistic abilities** of engineering students.
8. What do you mean **by Information Development.**
9. What does **Structure of technical articles** stand for.
10. Mention the different types of **Technical Articles.**

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PART - B

(Analytical/Problem solving questions)

Attempt any five questions (5×4=20)

1. Describe how to write a **Technical Project Proposal** in a step by step manner.
2. Recently your college held several competitions as part of Techfest celebrations. Write an article in 100-125 words on the topic 'The prize distribution' for your college magazine. Sign as sweety/suresh.
3. Write an E-mail to announce and congratulate your team as it has achieved the quarterly goal of reaching $500,000 in sales. Invent all relevant information.
4. What is the importance of **Communication Skills**? Discuss in detail.
5. On the basis of your reading of the passage given below, make **notes** in points only, using abbreviations, wherever necessary. Also, suggest a suitable title.

Although environmental pollution can be caused by natural events such as forest fires an active volcanoes, use of the word pollution generally implies that the contaminants have an anthropogenic source - that is, a source created by human activities. Pollution has accompanied humankind ever since groups of people first congregated and remained for a long time in any one place. Indeed, ancient human settlements are frequently recognized by their wastes - shell mounds and rubble heaps, for instance, Pollution was not a serious problem as long as there was enough space available for each individual or group. However, with the establishment of permanent settlements by great numbers of people, pollution became a problem, and it has remained one ever since.

Cities of ancient times were often noxious places, fouled by human wastes and debris. Beginning about 1000 CE, the use of coal for fuel caused considerable air pollution, and the conversion of coal to coke for iron smelting beginning in the 17th century exacerbated the problem. In Europe, from the Middle ages well into the early modern era, unsanitary urban conditions favoured the outbreak of population - decimating epidemics of disease, from plague to cholera and typhoid fever. Through the 19th century, water and air pollution and the accumulation of solid wastes were largely problems of congested urban areas. But, with the rapid spread of industrialization and the growth of the human population to unprecedented levels, pollution became a universal problem.

By the middle of the 20th century, an awareness of the need to protect air, water, and land environments from pollution had developed among the general public. In particular, the publication in 1962 of Rachel Carson's book Silent Spring focused attention on environmental damage caused by improper use of pesticides such as

DDT and other persistent chemicals that accumulate in the food chain and disrupt the natural balance of ecosystems on a wide scale. In response, major pieces of environmental legislation, such as the Clean Air Act (1970) and the Clean water Act (1972 ; United states), were passed in many countries to control and mitigate environmental pollution.

6. Suggest some tried and tested techniques on how to **Revise** a technical text.

7. Fill in the blanks (Any four) :

1. He ..... (write) to me every month.

   a. is writing b. has been writing

   c. had been writing d. writes

2. There was nothing he could do ..... wait.

   a. and b. except

   c. otherwise d. than

3. This damaged building is ..... sale.

   a. in b. at

   c. on d. for

4. He ..... (be) weak in english in the beginning.

   a. being b. was

   c. been d. has been

5. He became ..... IAS officer.

   a. an b. a

   c. no article d. the

PART - C

(Descriptive/Analytical/Problem solving/Design Question)

Attempt any Three questions. **(3×10=30)**

1. What is technical communication? Discuss the different forms of communication.

2. What do you mean by minutes of meeting? What 8 things should the minutes of a meeting include?

3. Ankush Goyal, a resident of 315, Goal Chouraila, Mumbai reads an advertisement in the newspaper for the requirement of engineering graduates to market the products of a multinational company located in Mumbai. He decides to apply for the same. Write Ankush's application to the personnel manager, Larsen and Turbo Ltd. 365, Badlapur, Mumbai.

4. You are Ankush/Ankita. You partook in a program planned by 'Enterpreneurs Club'. You had the opportunity of listening to professionals about social entrepreneurship, Scalable startup entrepreneurship, Small business entrepreneurship, Large company entrepreneurship, Innovation entrepreneurship, etc. Write a report on the program of about 150-200 words for "Entrepreneurs Avenues' mentioning the importance of entrepreneurship.

5. Write a note on information Design.

4E1330

Roll No. _____ [Total No. of Pages : 2

4E1330

B.Tech. IV Sem. (Main/Back) Examination - 2023
Information Technology
4IT3-04 Principle of Communication

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

Part - A

(word lmit 25)

All questions are **compulsory** **(10×2=20)**

1. What is the over - modulation in AM?
2. Calculate the modulation index, m of an Amplitude modulation wave if its V_{max}(p-p) = 5.9 divisions and V_{min}(p-p) = 1.2 divisions.
3. What is the need of pre - emphasis circuit in FM?
4. Explain the flat - top sampling.
5. How PWM is different than PPM?
6. What do you mean by Quantization in PCM?
7. What is the Delta modulation?
8. Define the term 'pulse shaping'.
9. How QPSK is different than PSK modulation?
10. Define FHSS.

Part - B

(Word limit 100)

Attempt any **five** questions **(5×4=20)**

1. Derive an expression for total power of an AM wave in terms of carrier power and modulation index.
2. Explain the operation of TDM with the help of suitable diagram and application.
3. Discuss the DPCM technique with the help of suitable diagram.
4. Explain the terms 'Line coding' and 'Inter - symbol interference' in a digital modulation.
5. Compare the FHSS with DSSS using suitable diagrams.
6. Draw the block diagram of a PLL and explain its working principle in brief?
7. Explain the terms 'Aliasing' and 'Interpolation' in Pulse Analog Modulation.

Part - C

(Descriptive/Analytical/Problem solving/Design questions)

Attempt any **Three** questions **(3×10=30)**

1. An antenna has an impedancce of 40 V. An unmodulated AM signal produces a current of 4.8 A. The modulation is 90 percent. Calculate (a) the carrier power, (b) the total power, and (c) the sideband power. The transmitter experiences an antenna current change from 4.8 A unmodulated to 5.1 A. What is the percentage of modulation?
2. Compare PAM, PWM and PPM modulation schemes with the help of suitable applications.
3. Derive the expressions for signal to quantization noise ratio in PCM and Delta modulation techniques.
4. Explain the following digital modulation techniques (any two) ;
   i. MSK.
   ii. FSK.
   iii. QPSK.
5. Write short notes on the following (any two) :
   i. CDMA.
   ii. Coherent BPSK.
   iii. Pseudo - Noise Sequences.

4E1304

Roll No. _____ [Total No. of Pages : 2

4E1304

B.Tech. IV - Sem. (Main/Back) Examination, July - 2023
Computer Science and Engineering (AI)
4CAI3-04 Microprocessor and Interfaces
CS, AID, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (As Mentioned in form No. 205).

PART - A

(Word limit 25)

All questions are **compulsory** **(10×2=20)**

1. What is the clock frequency and duty cycle required for 8085?
2. Write the uses of ALE and HOLD pins of 8085.
3. What are the steps involved in instruction cycle?
4. What is the use of temporary registers W and Z in 8085?
5. What happen with stack pointer after executing two PUSH instructions?
6. Name the different machine cycles.
7. Which addressing mode is used in instruction STAX D?
8. What is the use of RET instruction?
9. List the operating modes of 8255 PPI.
10. What is PSW in 8085?

PART - B

(word limit 100)

Attempt any **five** questions **(5×4=20)**

1. What are the different types of flags available in 8085? Explain in brief.
2. Draw the bus architecture of 8085 and explain.
3. Discuss bidirectional handshaking in 8255 PPI.
4. Draw and explain the timing diagram for memory write machine cycle.
5. Explain various addressing modes in 8085 with suitable example.
6. Write a delay subroutine using 8 bit register. What is the maximum possible delay obtainable.
7. Differentiate between Macro and Subroutine.

PART - C

Attempt any **Three** questions **(3×10=30)**

1. Draw the architecture of 8085 and explain each block clearly.
2. Write a program to transfer a block of memory data starting from one memory location to another memory location in reverse order.
3. Explain the use of control word for 8254 PIT.
4. Draw the architecture of 8259 PIC and explain.
5. Write technical note on RS422A and IEEE488.

4E1305

Roll No. _____ [Total No. of Pages : 3

4E1305

B.Tech. IV Sem. (Main) Examination, - July 2023
Computer Science and Engineering (AI)
4CAI4-05 Database Management System
CS, IT, AID, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (As Mentioned in form No. 205).

PART - A

(Word limit 25)

All questions are **compulsory** **(10×2=20)**

1. Write any four differences between file system and DBMS.
2. Draw state diagram of transaction.
3. What is ODBC? How does it differ from JDBC?
4. Consider a relation R(A,B,C,D,E) with A,B,C,D,E as attributes and functional dependency set $F = \{AB \rightarrow C, C \rightarrow D, B \rightarrow E\}$. Find out the candidate key.
5. How does weak entity differ from strong entity in ER model?
6. Explain various levels of data abstractions in DBMS.
7. How does correlated nested queries differ from simple nested queries. Explain with example.
8. Explain Aggregation with example.
9. Differentiate Generalization and Specialization.
10. In which applications, Embedded and Dynamic SQL are required?

PART - B

(Word limit 100)

Attempt any **five** questions **(5×4=20)**

1. Explain following joins with help of example -
   i. Theta join. ii. Equi Join.
   iii. Natural join. iv. Outer join.
2. How does triggers are useful in DBMS? Write a trigger in SQL to confirm value inserted in age field of a table is not less than 18 before inserting value.
3. Explain the role and importance of relational algebra. Also explain six basic operators of relational algebra with example.
4. Explain all six inference rules for functional dependency with example.
5. Consider the following schedule of three transactions T1, T2, T3 where X and Y are data items.

T1	T2	T3
	R(X)	
		R(X)
W(Y)		
	W(X)	
		R(Y)
	W(Y)	

   Using precedence graph, find out whether the schedule is conflict serializable or not?
6. Explain irrecoverable and recoverable schedules with example.
7. Explain following keys with example -
   a. Primary key b. Candidate key.
   c. Super key d. Foreign key.

PART - C

Attempt any **Three** questions **(3×10=30)**

1. How does various E-R model constructs relate to relation model construct. Draw the detailed E-R model for library management system and then convert this ER model to relational model by mapping various constructs.

2. Consider the relations defined below :

DOCTOR (regno, name, telno, city, specialization).

PATIENT (pname, street, city)

VISIT (pname, regno, data _of_visit, fee)

Where the regno and pname fields identify the doctor and the patient uniquely respectively. Express following queries in SQL -

a. Get the name and regno of doctors who live in Kota. **(1)**

b. Find the name and city of patient(s) who visited a doctor on date 12 - Aug - 2022. **(1)**

c. Find out all doctors whose name start with letter 'n'. **(1)**

d. Find doctors whose specialization in 'NEURO'. **(1)**

e. Find out total number of patients visited by each doctor. **(2)**

f. Print patient name and doctor name to whom he has visited for treatment. **(2)**

g. Find out name of doctors who have not visited any patient yet. **(2)**

3. Explain Shadow paging and log based recovery techniques with advantages and disadvantages of each.

4. What is normalization? Explain all types of normal forms with example?

5. Write short note on following concurrency control schemes :

a. Lock - based protocol.

b. Timestamp based protocol.

4E1306

Roll No. _____ [Total No. of Pages : 3

4E1306

B.Tech. IV-Sem. (Main/Back) Examination, July - 2023
Computer Science and Engineering
4CS4-06 Theory of Computation
CS, IT, AID, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all Ten** questions from **Part A**, Attempt any **Five** questions out of **Seven** questions from **Part B** and **Three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination (As Mentioned in form No. 205).

PART - A

(Word limit 25)

All questions are **compulsory**. **(10×2=20)**

1. Give the mathematical definition of finite automaton.
2. Construct an NFA, with the specified number of states, that accepts the language {w : w ends with 10} with three states.
3. Write a regular expressions over {0,1} consisting of strings that contain exactly two 1's.
4. Prove (1+00*1)+(1+00*1)(0+10*1)* (0+10*1) = 0*1(0+10*1)*.
5. Explain why the grammar given below is ambiguous.

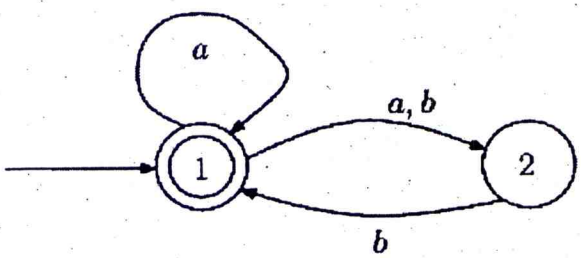
   $S \rightarrow 0A|1B, A \rightarrow 0AA|1S|1, B \rightarrow 1BB|0S|0$
6. What is difference between Finite State Automaton and Pushdown Automaton?
7. Explain the Chomsky Hierarchy in details.
8. Can all computational problems solved by computer?
9. What is Halting Problem?
10. List the problems belonging to polynomial class.

PART - B

(Word limit 100)

Attempt any **Five** questions. **(5×4=20)**

1. Convert the following NFA to an equivalent DFA.



2. Design a Mealy Machine that computes 2's complement of the given binary input number.

3. Use the pumping lemma to prove that the following languages is not regular.

   $\{a^n b^n : n \geq 0\}$

4. Let G be the grammar S->0B|1A.A->0|0S|1AA, B->1|1S|0BB.For the string 00110101, find (a) the leftmost derivation, (b) the rightmost derivation, and (c) the derivation tree.

5. Design a PDA accepting $\{a^n b^m c^n \quad m, n \geq 1\}$ by null store

6. Consider the TM description given M as shown in table. Draw the computation sequence of the input string 00.

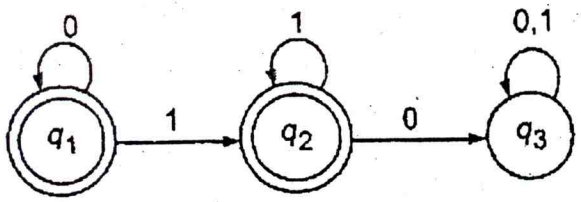
Present State	Tape symbol		
	b	0	1
$\rightarrow q_1$	$1Lq_2$	$0Rq_1$	
q_2	bRq_3	$0Lq_2$	$1Lq_2$
q_3		bRq_4	bRq_5
q_4	$0Rq_5$	$0Rq_4$	$1Rq_4$
(q_5)	$0Lq_2$		

7. Write a note on Tractable and Untractable Problems.

PART - C

Attempt any **Three** questions. **(3×10=30)**

1. Describe in English the set accepted by the finite automaton whose transition diagram is as shown in following figure.



2. Consider the context-free grammar G = (S, Σ, V, P), where V = {S,B},

   Σ={0, 1}, S is the start variable, and P consists of the rules $S \rightarrow BSB|B|\varepsilon$, $B \rightarrow 00|\varepsilon$ convert this grammar to a context-free grammar in Chomsky normal form whose language is the same as that of G. Throughout the construction, upper case letters will denote variables.

3. Let Σ={int, +, *, (,)} and consider the language ARITH = {w ∈ Σ*| w is a legal arithmetic expression} Design a PDA that accepts the int + int* int, ((int + int)*(int+int))+(int) types of arithmetic expression?

4. Design a Turing machine over {1,b} which can compute a concatenation function over Σ={1}. If a pair of words $(w_1,w_2\}$is the input and the output has to be w_1w_2..

5. Explain the traveling salesperson problem? Why this problem is NP-complete?

4E1307

Roll No. _____ [Total No. of Pages : 2

4E1307

B.Tech. IV - Sem. (Main/Back) Examination, July - 2023
Artificial Intelligence and Data Science
4AID4-07 Data Communication and Computer Networks
CS, IT, AID, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, Attempt any **five** questions out of **Seven** questions from **Part B** and **three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (As Mentioned in form No. 205).

Part - A

(Word limit 25)

All questions are **compulsory.** **(10×2=20)**

1. What is piggybacking?
2. Write use of checksum to find errors in data packet.
3. Differentiate digital and analog signals.
4. What is FTP?
5. Differentiate virtual circuit subnets and datagram subnets.
6. What is jitter?
7. What are the key elements of network protocols?
8. What are cyclic codes?
9. Explain DHCP in brief.
10. Differentiate gateway and routers.

Part - B

(Word limit 100)

Attempt any **five** questions **(5×4=20)**

1. What is optimality principle? Explain link state routing algorithm.
2. Explain the concept of fragmentation. Why fragmentation is done and how?

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3. What is guided transmission media? Explain Coaxial cable.
4. Describe selective repeat ARQ with example.
5. What is DNS? Explain its functioning.
6. Explain the term "Three Way Handshake" in Transport layer connection management.
7. What is silly window syndrome problem? Describe Clark's solution.

Part - C

Attempt any **Three** questions **(3×10=30)**

1. Explain OSI network model in detail.
2. How congestion is controlled at network layer? Explain leaky bucket algorithm.
3. Explain TCP header format. Differentiate TCP and UDP.
4. Explain Carrier sense multiple Access protocol (CSMA). Differentiate CSMA and ALOHA.
5. What is POP3? Explain how it is different from SMTP.

4E4165

Roll No. _____ [Total No. of Pages : 2

4E4165

B.Tech. IV - Sem. (Back) Examination, July- 2023
Computer Science and Engineering
4CS6A Principles of Programming Languages

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit.** All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination(Mentioned in form No.205)

UNIT - I

1. Explain the features of a good programming language. **[16]**

(OR)

Explain all the steps in the process of program translation from high level to low level language with suitable diagram. **[16]**

UNIT - II

2. Explain the specifications and implementation of structured data types with suitable diagrams. **[16]**

(OR)

What are arrays? Explain one-dimensional and two-dimensional arrays with suitable examples in 'C' language. **[16]**

UNIT - III

3. What is sequence control? Explain sequence control with arithmetic expressions, conditional statements and iterative statements with suitable examples. **[16]**

(OR)

What is subprogram? Differentiate between subprogram definition and subprogram activation with suitable example. **[16]**

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UNIT - IV

4. What are parameters? Explain call-by-value and call-by-reference parameter passing methods with suitable examples. **[16]**

(OR)

Write short notes on **ANY TWO**. **[8×2=16]**

i) Static and dynamic scope

ii) Local data and shared data

iii) Tasks and shared data

UNIT - V

5. Define the following terms. **[4×4=16]**

i) Abstract data type

ii) Information hiding

iii) Encapsulation

iv) Type definition

(OR)

5. Explain fixed-size and variable-size elements heap storage management with suitable diagrams. **[16]**
