PRINTED PAGES : 2

Paper ID: 16458

Roll No...2101013555...

END-SEMESTER EXAMINATION, 2022-23
BACHELOR OF TECH. (COMPUTER SC. & ENGG.) (SEMESTER : 04)
CSA 203 : CONCEPTS OF NEURAL NETWORKS

Time : 3 Hrs. **Max. Marks: 100**

Note: 1. **All** questions are compulsory.
2. Assume missing data suitably, if any.

CO1: Define biological significance of neural network and list ANN Components.
CO2: Classify various learning paradigms based on Real Life Problems
CO3: Apply basic concepts to build Single and Multi-layer feed-forward Neural Networks.
CO4: Apply basic concepts to build Single and Multi-layer feed-forward Neural Networks.
CO5: Explain self-organizing map for Real Life Problems.
CO6: Discuss and adapt appropriate neural networks model for Real Life Applications.

		COs	Marks	BTL
SECTION-A				
All Questions are Compulsory:			**(10×4=40 Marks)**	
1.	What is the function of dendrite?	CO1	4	K1
2.	Explain the characteristics of logistic functions.	CO1	4	K2
3.	Define supervised and unsupervised learning.	CO2	4	K1
4.	Show the architecture of 10/16/5 multiplayer feed forward neural network.	CO2	4	K2
5.	Explain the the factors that affect the performance of multilayer feed-forward neural network.	CO3	4	K2
6.	Select characteristics and Limitations of Single Layer Perceptron network.	CO3	4	K3
7.	Explain RBF Neural Network.	CO4	4	K2
8.	Construct Time-Delay Neural Networks.	CO4	4	K3
9.	Demonstrate briefly what is Hopfield Memory.	CO5	4	K2
10.	Build the Architecture of ART1.	CO5	4	K3
SECTION-B				
All Questions are Compulsory:			**(3×6=18 Marks)**	
11.	(a) Distinguish between Gradient Descent and Stochastic Gradient Descent.	CO3	6	K4
	--- OR ---			
	(b) Examine the different types of perceptron model.	CO4	6	K4
12.	(a) Distinguish between Auto Associative Memory and Hetero Associative Memory.			
	--- OR ---			
	(b) Examine Self-organizing neural networks? Explain briefly.			

Contd.....

13. (a) Discover the architecture of a typical Time-Delay –Neural Network (TDNN). CO5 6 K4

--- OR ---

(b) Compare different distance measures function.

SECTION-C

(3×10=30 Marks)

All Questions are Compulsory:

14. (a) Explain the practical considerations in implementation of feed-forward neural networks. CO3 10 K4/K5

--- OR ---

(b) Analyse the effect of learning rate on learning process. CO4 10 K4/K5

15. (a) Explain the RBF Network Architecture in detail.

--- OR ---

(b) Discover a Kohonen network with two cluster units and five input units. The weigh vectors for the cluster units are:

w1 = [0.1, 0.3, 0.5, 0.7, 0.9]

and

w2 = [0.9, 0.7, 0.5, 0.3, 0.1]

Use the square of the Euclidean distance to find the winning cluster unit for the input pattern.

16. (a) Explain in details the working of Self-Organizing Maps (Kohonen maps). CO5 10 K4/K5

--- OR ---

(b) Inspect the training algorithm for the RBF NN with its flowchart.

SECTION-D

(1×12=12 Marks)

Attempt the following Question:

17. (a) Discuss the process of learning in radial basic function networks. CO6 12 K5/K6

--- OR ---

(b) Explain various types of Adaptive Resonance Theory and also highlight their advantages/limitations in the context of newural networks.

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Paper ID: 16473 PRINTED PAGES : 2

Roll No. 2101101355

END-SEMESTER EXAMINATION, 2022-23
BACHELOR OF TECH. (COMPUTER SC. & ENGG.) (SEMESTER : 04)
CSA 021 : HUMAN COMPUTER INTERACTION

Time : 3 Hrs. **Max. Marks: 100**

Note: 1. **All** questions are compulsory.
2. Assume missing data suitably, if any.

CO1: Define the capabilities of both humans and computers from the viewpoint of human information processing.
CO2: Explain typical Human–Computer Interaction (HCI) models, styles, and various Historic HCI Paradigms.
CO3: Apply HCI design principles, standards and guidelines.
CO4: Analyse and identify user models, user support, Socio-organizational issues, and stakeholder requirements of HCI Systems.
CO5: Analyse the tasks of HCI Systems.
CO6: Adopt a variety of simple methods for evaluating the quality of a user interface.

SECTION-A

All Questions are Compulsory: **(10×4=40 Marks)**

		COs	Marks	BTL
1.	Define the model of the structure of human memory along with its capabilities and limitations.	CO1	4	K1
2.	Explain User-Centered Design (UCD) as an iterative design process with the help of diagrams.	CO1	4	K2
3.	What are the characteristics of HCI?	CO2	4	K1
4.	Explain Deductive reasoning with examples.	CO2	4	K2
5.	Explain the goals of interactive system design with respect to usability engineering.	CO3	4	K2
6.	Identify the ways in which Long- Term memory can be triggered in humans.	CO3	4	K3
7.	Distinguish UI Vs UX Design. How usability and user interface design are important aspects of UX design?	CO4	4	K2
8.	Identify and explain GOMS model. Write steps to get money and "not to lose your card" in an ATM machine.	CO4	4	K3
9.	Explain layers of development tools in detail in support of HCI implementation.	CO5	4	K2
10.	Identify and Explain GOMS model. Write steps to get money and "not to lose your card" in an ATM machine. Define Universal Design.	CO5	4	K3

SECTION-B

All Questions are Compulsory: **(3×6=18 Marks)**

11.	(a) Distinguish predictive and descriptive model for interaction in HCI. Give examples of each type model based on laws of design.	CO3	6	K4

--- OR ---

Contd.....

(b) Identify the meaning by design? Explain the design process with the help of a diagram.

12. (a) Discover multi-model HCI. Draw diagrams in support of your answer. CO4 6 K4

--- OR ---

(b) Examine the architectures of windowing systems. Draw diagrams in support of your answer.

13. (a) Examine seven principles of universal design in detail. CO5 6 K4

--- OR ---

(b) Examine the guidelines needed to be followed for smooth usability testing.

SECTION-C

(3×10=30 Marks)

All Questions are Compulsory:

14. (a) Analyse and discuss user centered design. Explain its purpose in software design. CO3 10 K4/K5

--- OR ---

(b) Discover the two major forms of long term memory. Explain with examples.

15. (a) Examine seven principles of universal design in detail. CO4 10 K4/K5

--- OR ---

(b) Explain the ways of human interaction with the system using sound and gesture with examples.

16. (a) Justify Neilsen's Heuristics of HCI evaluation. CO5 10 K4/K5

--- OR ---

(b) Distinguish between evaluation methods in HCI.

SECTION-D

(1×12=12 Marks)

Attempt the following Question:

17. (a) Elaborate between pagination and breadcrumbs in context of design patterns in HCI. CO6 12 K5/K6

--- OR ---

(b) Elaborate toolkits? How do toolkits provide abstraction.

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Paper ID: 16138 Roll No.....

END-SEMESTER EXAMINATION, 2022-23

B. Tech. (SEMESTER : 04)

BTY 223 : INTRODUCTION TO BIOLOGY FOR ENGINEERS

Time: 2 Hrs. Max. Marks: 100

Note: 1. All questions are compulsory.
2. Assume missing data suitably, if any.

CO1: Understand The Fundamentals Of Living Things, Their Classification, Cell Structure And Biochemical Constituents
CO2: Apply The Concept Of Plant, Animal And Microbial Systems And Growth In Real Life Situations.
CO3: Comprehend Genetics And The Immune System.
CO4: Know The Cause, Symptoms, Diagnosis And Treatment Of Common Diseases.
CO5: Give A Basic Knowledge Of The Applications Of Biological Systems In Relevant Industries.
CO6: To Have An Overall Knowledge And Understanding Of The Impact Of Biology In Human Life

		COs	Marks	BTL
SECTION-A				
All Questions are Compulsory:			**(5×5=25 Marks)**	
1.	What are the different characteristics of living organisms?	CO1	5	K1
2.	What is the function of protein?	CO2	5	K1
3.	Interpret the role of the T Lymphocytes.	CO3	5	K2
4.	Explain the action of covaxin and illustrate its limitations.	CO4	5	K2
5.	Why is that a patient infected with HIV is not always said to suffer from AIDS; but a patient who suffers from AIDS, is said to have HIV in his/her body? Provide reasoning to support your answer.	CO5	5	K3
SECTION-B				
All Questions are Compulsory:			**(3×8=24 Marks)**	
6.	(a) Apply what is Evolution? Explain Darwin theory.	CO3	8	K3
	--- OR ---			
	(b) Identify the function of SER and RER.			
7.	(a) Distinguish between Immunity and Immune system.	CO4	8	K4
	--- OR ---			
	(b) Examine causes of Cancer and its treatment and relevance in medicine.			
8.	(a) Categorise the methods and drugs used in treating cancer.	CO5	8	K4
	--- OR ---			
	(b) What do you understand by biofertilizers? List the different types of biofertilizers.			

Roll No. 2101013555

SECTION-C

(3×12=36 Marks)

All Questions are Compulsory:

9. (a)	List the Mendel's laws of inheritance.	CO3	12	K4/K5
	--- OR ---			
(b)	Discover the process of detoxifying contaminants present in soil, water. Expand on the various ways in which the process of bioremediation can be carried out.	CO4	12	K4/K5
10. (a)	Distinguish between genetic diseases and infectious diseases, with suitable examples.	CO5	12	K4/K5
	--- OR ---			
(b)	Examine the causes and treatment of inflamatory diseases and its prevention strategies.			
11. (a)	List the important industrial applications of the bioreactors.			
	--- OR ---			
(b)	What do you understand by Bioreactors? List the different functions of different components of the bioreactor.			

SECTION-D

(1×15=15 Marks)

Attempt the following Question:

12. (a)	Explain the general classification and important functions of lipids.	CO6	15	K5/K6
	--- OR ---			
(b)	Explain structure of prokaryotic and eukaryotic cell with diagram.			

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Roll No. 2101013559

Paper ID: 16282

END-SEMESTER EXAMINATION, 2022-23
BACHELOR OF TECH. (COMPUTER SC. & ENGG.) (SEMESTER : 04)
CSE 252 : COMPUTER NETWORKS

Time: 3 Hrs. Max. Marks: 100

Note: 1. **All** questions are compulsory.
2. Assume missing data suitably, if any.

CO1: Demonstrate And Differentiate Working Of All Layers Of The OSI Reference Model And TCP/IP Model.
CO2: Investigate And Explore Fundamental Issues Driving Network Design Including Error Control.
CO3: Understand And Building The Skills Of IP Addressing, Subnetting And Routing Protocols.
CO4: Understand And Building The Skills Of IP Addressing, Subnetting And Routing Protocols.
CO5: Describe The Connection Management And Application Layer Protocols.
CO6: Outline The Basic Knowledge Of The Use Of Cryptography And Network Security.

		COs	Marks	BTL
	SECTION-A			
	All Questions are Compulsory:		**(10×4=40 Marks)**	
1.	What is mode of transmission? Explain all type of transmission modes.	CO1	4	K1
2.	What is a computer network? Discuss the classification of computer networks.	CO1	4	K2
3.	Tell the services provided by the data link layer to the network layer.	CO2	4	K1
4.	Explain CSMA/CD.	CO2	4	K2
5.	Explain Leaky Bucket algorithm.	CO3	4	K2
6.	Apply Static Routing and Dynamic Routing with the help of an example.	CO3	4	K3
7.	Explain the fields on which the UDP checksum is calculated. Why?	CO4	4	K2
8.	Identify the advantages of using UDP over TCP.	CO4	4	K3
9.	Explain the Domain Name System.	CO5	4	K2
10.	Construct a diagram to explain the Unicast & Multicast communication.	CO5	4	K3
	SECTION-B			
	All Questions are Compulsory:		**(3×6=18 Marks)**	
11.	(a) Categorise the diffrent Classful addressing.	CO3	6	K4
	--- OR ---			
	(b) Examine the motivation for moving from IPv4 to IPv6.			
12.	(a) Classify the mechanisms that can alleviate congestion.	CO4	6	K4
	--- OR ---			
	(b) List some ways to deal with congestion.			
13.	(a) Compare HTTP and HTTPS.	CO5	6	K4
	--- OR ---			
	(b) Explain 3-way handshake protocol.			

Contd.....

SECTION-C

All Questions are Compulsory: **(3×10=30 Marks)**

14. (a) Consider a source computer(S) transmitting a file of size 106 bits to a destination computer(D)over a network of two routers (R1 and R2) and three links(L1, L2, and L3). L1connects S to R1; L2 connects R1 to R2; and L3 connects R2 to D.Let each link be of length 100 km. Assume signals travel over each link at a speed of 108 meters per second.Assume that the link bandwidth on each link is 1Mbps. Let the file be broken down into 1000 packets each of size 1000 bits. Find the total sum of transmission and propagation delays in transmitting the file from S to D — CO3 10 K4/K5

--- OR ---

(b) Explain classful IPv4 addressing with examples.

15. (a) Examine TCP Header and explain all the fields in detail. — CO4 10 K4/K5

--- OR ---

(b) Analyse the characteristics related to QoS and also explain the techniques to improve QoS.

16. (a) Explain the steps involved in the RSA. — CO5 10 K4/K5

--- OR ---

(b) Explain the following:i) WWW ii) UDP.

SECTION-D

Attempt the following Question: **(1×12=12 Marks)**

17. (a) Elaborate Data Encryption Standards (DES) with all rounds and also explain one of the rounds in detail. — CO6 12 K5/K6

--- OR ---

(b) Assess the following Hamming coded (single bit correction) string was received: 010101010111. Is there an error? If yes, in which position?

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Paper ID: 16299 Roll No.....

END-SEMESTER EXAMINATION, 2022-23
BACHELOR OF TECH. (COMPUTER SC. & ENGG.) (SEMESTER : 04)
CSE 250 : THEORY OF COMPUTATION AND COMPILER DESIGN

Time: 3 Hrs. Max. Marks: 100

Note: 1. **All** questions are compulsory.
2. Assume missing data suitably, if any.

CO1: DFA And NDFA And Conversion From NDFA To DFA. Construct Finite Automata Without Output And With Output.
CO2: Implement Regular Expression And Grammar Corresponding To DFA And Vice-versa. Explain The Concepts And Different Phases Of Compilation With Compile Time Error Handling.
CO3: Design Push Down Automata From Context Free Language Or Grammar And Vice-versa.
CO4: Compare Top Down With Bottom Up Parsers. And Develop Appropriate Parser To Produce Parse Tree Representation Of The Input
CO5: Design Syntax Directed Translation Schemes For A Given Context Free Grammar.
CO6: Generate Intermediate Code For Statements In High Level Language. Benefits And Limitations Of Automatic Memory Management. Optimization Techniques To Intermediate Code And Generate Machine Code For High Level Language Program

SECTION-A

All Questions are Compulsory: **(10×4=40 Marks)**

		COs	Marks	BTL
1.	Find DFA to accept set of all strings over {0, 1} of odd length.	CO1	4	K1
2.	Compare Non deterministic finite state automaton (NFA) from a Deterministic finite state automaton (DFA).	CO1	4	K2
3.	Show the Unit Production Removal for below CFG: S→XY, X→a, Y →Z | b, Z→M, M→N, N→a	CO2	4	K1
4.	Explain Arden's theorem with its application.	CO2	4	K2
5.	Compare pushdown Automaton and NFA.	CO3	4	K2
6.	Identify rules for the conversion of Grammars to PDA.	CO3	4	K3
7.	Explain the purpose of lexical analysis with example.	CO4	4	K2
8.	Model the different phases of compiler.	CO4	4	K3
9.	Outline various types of intermediate code representation.	CO5	4	K2
10.	Identify with example, why the code optimization is optional phase.	CO5	4	K3

SECTION-B

All Questions are Compulsory: **(3×6=18 Marks)**

11.	(a) Simplify and convert the given expression to PDA: I --> a | b | Ia | Ib | I0 | I1	CO3	6	K4
	--- OR ---			
	(b) Examine the Instantaneous Description and move relation in terms of PDA.			

Contd.....

12. (a) Distinguish Syntax and Semantic Analyzer. CO4 6 K4

--- OR ---

(b) Contrast the common conflicts that can be encountered in shift reduce parsers. Explain.

13. (a) List the properties that a code generator should possess. CO5 6 K4

--- OR ---

(b) What is the need for symbol table? How is it useful for various compilers?

SECTION-C

(3×10=30 Marks)

All Questions are Compulsory:

14. (a) Discover a PDA accepting language of strings with unequal number of a's and b's. CO3 10 K4/K5

--- OR ---

(b) Explain two-stack push down automata using suitable diagram. Also give its advantages over ordinary push down automata.

15. (a) Contrast Operator Precedence Parsing. CO4 10 K4/K5

--- OR ---

(b) Explain the steps for the efficient construction of LALR parsing table with an example.

16. (a) Examine the three address codes and their variants. CO5 10 K4/K5

--- OR ---

(b) Define Code Optimization Techniques.

SECTION-D

(1×12=12 Marks)

Attempt the following Question:

17. (a) Elaborate the machine independent optimizations and the different techniques used for it. CO6 12 K5/K6

--- OR ---

(b) Interpret Non Recursive Predictive Parsing - LL(1) Parser.

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Paper ID: 16280

Roll No. 2101013155

END-SEMESTER EXAMINATION, 2022-23
BACHELOR OF TECH. (COMPUTER SC. & ENG.G.) (SEMESTER - 04)
CSE 249 : DATA BASE MANAGEMENT SYSTEM

Time: 3 Hrs. Max. Marks: 100

Note: 1. All questions are compulsory.
2. Assume missing data suitably, if any.

CO1 Explain the basics concepts of Data Base
CO2 Demonstrate the knowledge of Databases To E-R Modelling
CO3 Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL Queries on the Respective Data.
CO4 Learn the basic concept of normalization & apply them to reduce redundancy from the Database
CO5 To appraise the basic issues of transaction processing, Serializability & Concurrency Control
CO6 Design & develop database for real life problems

		COs	Marks	BL

SECTION-A

All Questions are Compulsory: (10×4=40 Marks)

1	What are attributes? Give examples.	CO1	4	K
2	List out the notations of E-R diagram and their Meaning	CO1	4	K
3	Consider the following database schema: Student (St_id, Name), Enrolled_In (St_id, Sub_code), Subject (Sub_code, Lecturer) Express the following queries in Relational Algebra (i) What are the names of students taking a subject taught by Roger (ii) What are the names of students who are taking a subject not taught by Roger. (iii) Who teaches cs1500?	CO2	4	K
4.	Explain the following concepts in context of relational model. (i) Relation (ii) Attributes (iii) Tuple (iv) Cardinality	CO2	4	
5	Classify all the rules for normalization. Find the highest normal form of relation R (A, B, C, D, E) with FD set as {BC→D, AC→BE, B→E}. If R is not in BCNF, decompose it into a set of BCNF relations that preserve the dependencies	CO3	4	
6	Construct an example to differentiate between Trivial and Non-Trivial Functional Dependency.	CO3	4	
7	Explain the term Functional Dependency with example	CO4	4	
8.	Apply ACID properties of transaction processing system by constructing an example.	CO4	4	
9.	Contrast the properties of transaction? Check whether the schedules are conflict serializable or not and Find out possible serial schedules also. S: R2(A); R3(C); W3(A); W2(A), W2(B); W3(C); R1(A); R1(B); W1(A); W1(B)	CO5	9	
10	Explain timestamp based protocol for concurrency control	CO5	4	

SECTION-B

All Questions are Compulsory: (3×6=18 Marks)

11	(a) Analyse, how can we differentiate all possible join operations? Show it by example.	CO3	6	

--- OR ---

(b) a) Suppose you are given a relation R(A,B,C,D) [illegible] of given FDs, A→B, BC→D, A→C. (i) Identify the candidate key(s) for R. (ii) Identify the best normal form that R satisfies (1NF, 2NF, 3NF or BCNF). (iii) If R is not in BCNF decompose it into a set of BCNF relations that

12. (a) Analyse the importance of different anomalies in designing a Database [illegible]

--- OR ---

(b) Analyse the following schedule and justify your answer whether the schedule is recoverable or not T1:R1(A),W1(A); Commit1, T2: R2(A)W2(A),Commit2.

13 (a) Analyse Multiversion Concurrency Control Techniques. [illegible]

--- OR ---

(b) Test out different type of failure. Explain the use of cascading rollback and recoverable scheduling through example.

SECTION-C

All Questions are Compulsory: **(3×10=30 Marks)**

14. (a) Define Candidate Key, Primary Key, Foreign Key, Super Key, Alternate Key, composite Key and Unique Key with the help of an example. CO3 10 K4/K5

--- OR ---

(b) Evaluate the relational Schemas as follows:

Teacher (Teacherid, Tname , Department)

Student (RollNo, Sname, Branch)

Teaches (TeacherId, Rollno, Subject)

Write the following queries in SQL:

(i) Write the SQL statement to create & insert above database.

(ii) List the name and branch of the students registered for the subject 'DBMS'

(iii) List the name of teachers and their concerned department who are offering either 'DBMS' or 'Operating System'

15. (a) Analyse various Armstrong's Axioms in the functional dependency. CO4 10 K4/K

--- OR ---

(b) Examine how BCNF is better than third Normal Form.

16 (a) Examine the importance of Recoverable Schedules and Cascadeless Schedules with suitable example. CO5 10 K4/K

--- OR ---

(b) Evaluate Two-Phase Locking Techniques for Concurrency Control.

SECTION-D

Attempt the following Question: **(1×12=12 Mark)**

17. (a) Given R (A ,B ,C ,D E) with the set of FDs, F{AB → CD,A → E,C → [illegible] CO6 12 K5/K

(C ,E,D) lossless? Determine major problem associated with concurrent processing with example.

--- OR ---

(b) Design Conflict Serializability with the help of an example.

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