Code No: E-5792/N/BL/AICTE

FACULTY OF ENGINEERING

B.E. CSE (AI&ML) V-Semester (AICTE) (Backlog) (New) Examination, September/ October 2023

Subject: Artificial Intelligence

Time: 3 Hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) State any two application of AI.
   b) What is Rational Agent?
   c) Explain Uniformed Search.
   d) What is Planning vs Program solving?
   e) Define Membership function in fuzzy system.
   f) What are the component of NLG?
   g) Differentiate machine vision vs Machine Learning.

2. a) Explain Alpha Beta pruning with a suitable Example.
   b) Write the steps for MINIMAX Strategy in detail.

3. a) Explain Forward chaining and Backward chaining in detail.
   b) Write short notes on First Order Logic.

4. a) Discuss the architecture of an Expert System.
   b) Explain Utility theory and Utility Functions.

5. a) Explain the Machine Leaning systems in detail.
   b) Define Decision Trees and explain with a suitable example.

6. a) Explain Parsing with example.
   b) Describe Speech Recognition in terms of Language model and Acoustic model.

7. a) Explain BFS and DFS Algorithm in AI.
   b) Explain Application of Fuzzy Logic.

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FACULTY OF ENGINEERING

B.E. CSE (AI & ML) V - Semester (AICTE) (Main) (New) Examination, February/ March 2023

Subject: Artificial Intelligence

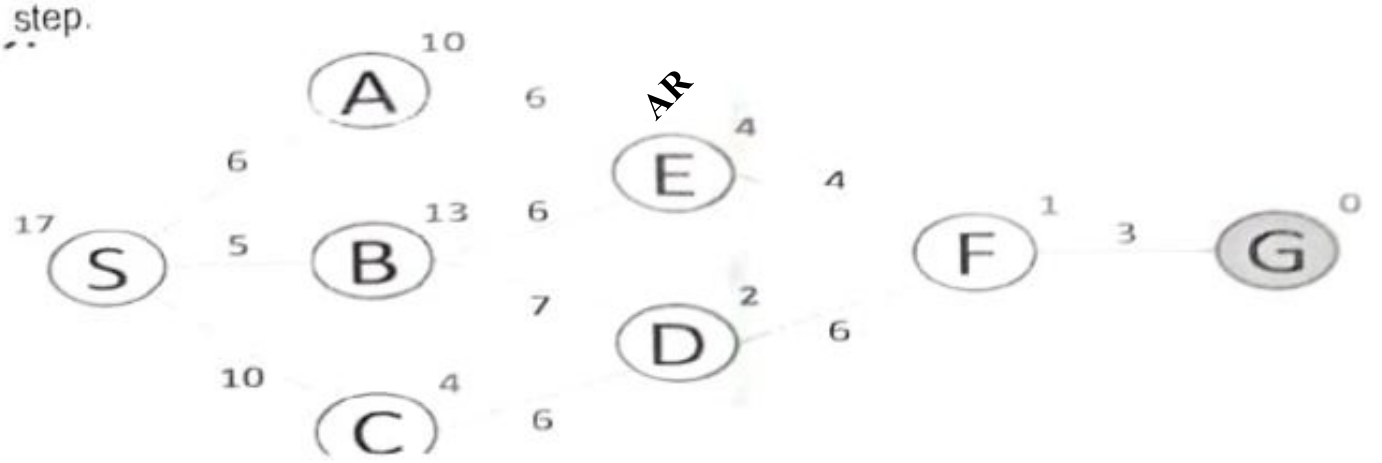
Time: 3 Hours

Max. Marks: 70

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) What are the components of AI.
   b) Distinguish between un-informed search and heuristic search.
   c) A "Fraud detection" is an example of which type Machine Learning, Justify.
   d) What is partial order planning?
   e) Define Uncertainty and list the reasons for uncertainty.
   f) Write short notes on HARPY speech recognition system.
   g) Define Machine Vision.

2. a) Perform A* Algorithm on the following figure. Explicitly write down the queue at each step.



   b) Explain Alpha Beta Pruning with a suitable example.

3. a) Explain partial order planning with an example.
   b) Explain in detail about different types of knowledge representation in AI.

4. a) Differentiate between a crisp set and a fuzzy set. Define membership function in fuzzy system.
   b) What is an Expert system? Explain the Architecture of an Expert System.

5. a) Define Machine Learning. Explain Supervised, Unsupervised and Reinforcement Learning with suitable examples.
   b) What is ANN? Write short notes on Single-Layer Feed Forward and Multi-Layer Feed-Forward networks.

6. a) What are the components of NLP? Explain in detail.
   b) Write short notes on ASR.

7. a) Write short notes on Fuzzy Inference System
   b) Write the applications of Expert System and limitations of Expert System
   c) Define Machine Vision and its applications

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FACULTY OF ENGINEERING

B.E. CSE (AI & ML) V-Semester (AICTE) (Backlog) (New) Examinations,
September/October 2023
Subject: Operating Systems

Time: 3 Hours Max. Marks: 70

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. (a) List out the Functionality of Operating Systems?
   (b) State the block diagram of PCB.
   (c) Define Turn Around Time and Waiting Time?
   (d) Define fragmentation?
   (e) Discuss about thrashing.
   (f) Define Semaphore?
   (g) Identify File Attributes?

2. (a) Classify about System Calls? Explain the different categories of the System Calls with Example?
   (b) Discuss about Real time operating System.

3. (a) List out the various process states and briefly explain the same with a state diagram?
   (b) Prepare the following data with burst time given in milliseconds and Draw Gantt charts for the execution of these processes using Round Robin with time quantum of 2units.

PID	Burst Time	Arrival Time
P1	10	0
P2	4	0
P3	6	1
P4	2	2
P5	3	1

Calculate turnaround time and waiting time of each process, average waiting time and average Turnaround time for each of the scheduling algorithm?

4. (a) Explain Banker's algorithm for deadlock avoidance.
   (b) Explain about Readers writers Problem and discuss how it will be solved?

5. (a) Evaluate number of page faults using Optimal page replacement algorithm for the given page reference string with 03 frames 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
   (b) Differentiate contiguous and non-contiguous memory allocation.

6. (a) Suppose the disk drive has 200 cylinders numbered 0-199. The drive is seeking a request at cylinder 53, the queue of pending request are 98, 183, 37, 122, 14, 124, 65, 67. Calculate the disk arm movements using C-SCAN disk scheduling algorithm.
   (b) Explain RAID structure.

7. (a) Write a short note on
   (i) Critical Section (ii) Mutual Exclusion
   (b) Write a short note on
   (i) File access Methods (ii)Types of Schedulers

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Code No: E-5793/N/AICTE

FACULTY OF ENGINEERING

B.E. CSE (AI & ML) V - Semester (AICTE) (Main) (New) Examination,
February/ March 2023
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Subject: Operating Systems

Time: 3 Hours Max. Marks: 70

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
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1. (a) Differentiate process and thread.
   (b) Define context switching with a neat diagram.
   (c) When does a 'race condition' occur?
   (d) What is a semaphore? List the operations that can be performed on semaphore.
   (e) Draw the neat diagram for the Levels of RAID.
   (f) What is interprocess communication?
   (g) Explain Segmentation with paging?

2. (a) Describe the essential properties of the Real Time and Distributed Operating System.
   (b) Explain process transition diagram.

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3. (a) Explain paging with an example.
   (b) Discuss various directory structures with suitable examples.

4. Consider the following page-reference string 10
   7,0,2,1,3,4,2,1,0,2,1,4,3,2,1,0,0,1,2,1.
   Calculate the number of page faults that would occur for the following algorithms assuming frame size as 3. (i) FIFO (ii) Optimal (iii) LRU (iv) MRU (v) LFU (vi) MFU

5. (a) What is dining-philosophers problem? Describe the solution of dining philosopher's problem using monitors.
   (b) Write the bankers algorithm for deadlock avoidance.

6. (a) Write about the implementation of the Access Matrix.
   (b) Explain in detail about Disk scheduling algorithms

7. Write notes on any two of the following:
   (a) Segmentation
   (b) Semaphores
   (c) Concept of Multi threads

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Code No. E-5795/N/AICTE

FACULTY OF ENGINEERING

B.E. CSE (AI & ML) V - Semester (AICTE) (Main) (New) Examination, February/ March 2023

Subject: Speech & Natural Language Processing

Time: 3 Hours Max. Marks: 70

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) Write about NLP origin.
   b) Define Automata and Finite state transducers.
   c) Define minimum edit distance.
   d) Define the terms i) Uni-gram ii)Bi-gram
   e) Differentiate Voiced sound and Unvoiced sound.
   f) Write the short notes on Gestural phonology.
   g) Define Lexical stress.

2. a) What is Language Modeling? Name and explain 2 different types of LM's.
   b) Write about English Morphology and Lexicons used in Finite State Transducers (FST).

3. a) What are word classes? Write about Parts-of-speech (POS) tagging and the different tags used for basic word classes with examples.
   b) Explain Smoothing (Discounting), Interpolation and Back-off in N-Gram models.

4. a) What are the different types of tagging? Write in brief about each one.?
   b) Write about semantics roles & analysis along with attribute grammar? What is word sense? Explain briefly

5. a) Explain Applications of Word Sense Disambiguation (WSD)?
   b) Explain Dependency graph for the sentence "This tree is illustrating the constituency relation"?

6. a) Explain consonants place of Articulation and consonants manner of Articulation?
   b) Explain Phonological categories and Pronunciation variation?

7. a) Explain about Articulatory Phonetics?
   b) Write about Phonetic features.

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Code No: E-5795/N/BL/AICTE

FACULTY OF ENGINEERING

B.E. CSE (AI & ML) V - Semester (AICTE) (Backlog) (New) Examination, September /October 2023

Subject: Speech and Natural Language Processing

Time: 3 Hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
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1. a) Define Stemming.
   b) Write about Named Entities.
   c) What is meant by Lexicon? How is it useful in NLP?
   d) Define the term N-gram.
   e) Define Source-Filter Model.
   f) What are labial words?
   g) Define Lexical stress.

2. a) What is Language Modeling? Name and explain 2 different types of LM's?
   b) Write about English Morphology and Lexicons used in Finite State Transducers (FST).

3. a) What is the Hidden Markov Model (HMM) and Maximum Entropy Markov Model (MEMM)? How are they used in the process of POS tagging?
   b) Explain Smoothing (Discounting), Interpolation and Back-off in N-Gram models.

4. a) What are the different types of tagging? Write in brief about each one?
   b) Write about semantics roles & analysis along with attribute grammar? What is word sense? Explain briefly.

5. a) Explain consonants place of Articulation and consonants manner of Articulation.
   b) Explain Phonological categories and Pronunciation variation.

6. a) What are consonants and their different parts? Write in short notes about Phonetics and their different types?
   b) Write about Phonetic features.

7. a) Explain Applications of Word Sense Disambiguation (WSD).
   b) Explain Dependency graph for the sentence "This tree is illustrating the constituency relation".

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Code No. E-5794/N/AICTE

FACULTY OF ENGINEERING

B.E. CSE (AI&ML) V – Semester (AICTE) (Main) (New) Examinations, February/ March 2023

Subject: Web and Internet Technologies

Time: 3 Hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) Illustrate a) WWW b) URL c) HTTP d) Web Browser
   b) Write JavaScript function to validate email-id.
   c) Define CSS. Illustrate with an example the concept of external styling in HTML5.
   d) Define AJAX and its importance.
   e) Explain DTD. What is the use of DTD? How to link an externalDTD into and XML Document.
   f) What is the difference between Servlet Context and Servlet Config objects?
   g) What is JSP Engine? What is the use of it?

2. a) Create a form to accept the details of a student: Name, Address, Sex(Male/Female), Electives (Check box), and Branch (chosen from a list box).Provide submit and Reset buttons on it.
   b) Write short note on the following tags. < img >, < table >, <a>, < pre >

3. a) Write a JavaScript code to find sum of n even numbers? Read the value of n from user?
   b) Difference between JavaScript and Ajax?

4. a) What is the use of XML namespaces? Explain in detail with an example?
   b) Write a short note on DOM and SAX.

5. a) Draw the life cycle of Servlet. Explain in detail steps involved in deploying a web application.
   b) Explain the functionality of javax.servlet.http package by discussing about classes, interfaces, and methods of this package.

6. a) Explain Different Types of JSP Directives in detail.
   b) Write a program to create iterative custom tag using Tag Extension.

7. a) Demonstrate with a sample code to include different multimedia content and external files into a WebPage usingHTML5.
   b) Explain in detail the mechanisms to secure a web application.

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Code No: E-5794/N/BL/AIC

FACULTY OF ENGINEERING

B.E. CSE (AI&ML) V-Semester (AICTE) (Backlog) (New) Examination, September/ October 20

Subject: Web and Internet Technologies

Time: 3 Hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
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1. a) Explain about Lists in HTML.
   b) List out Features of JavaScript.
   c) Define XSLT.
   d) Explain Servlet API.
   e) Write JavaScript for validating phone number.
   f) What is JSP?
   g) Define WWW and URL.

2. a) Explain how to create HTML forms in detail.
   b) Design a HTML form page for Railway reservation System.

3. a) Explain about Syntactic characteristics and control structures of JavaScript.
   b) Illustrate on AJAX using example code.

4. a) What is XML Schema? Explain in detail with example.
   b) Write short notes on following (i) J2EE modules (ii)JDBC drivers

5. a) Explain about Servlet API.
   b) Elaborate about session tracking mechanisms.

6. a) Explain in detail Life Cycle of JSP.
   b) Discuss on how to work with Action tags of JSP.

7. a) Write an XML program which will display the Book information which includes the following Title of the book , Author Name ,Edition, Publisher name and Price.
   b) Write short notes on Web Browsers, Web Servers and Multimedia.

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Code No. : E-5791/N/BL/AICTE

FACULTY OF ENGINEERING

B.E.CSE (AI & ML) V - Semester (AICTE) (Backlog) (New) Examination, September /October 2023

Subject: Compiler Design

Time: 3 Hours **Max. Marks: 70**

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
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1. a) Define bootstrapping and the need of bootstrapping.
   b) What is left factoring and left recursion? Give an example.
   c) How to remove ambiguity from CGF grammar?
   d) Write about YACC.
   e) Differentiate between Synthesized attributes and Inherited attributes.
   f) Define Garbage Collection.
   g) Write triple notation for the following statement. X=-a+b*-a+b.

2. List out the phases of compiler? Explain all the phases in detail and write down the output for the expression a=b+c*60.

3. a) Construct SLR parsing table for the following grammar
   S→CC
   C→aC|d
   b) Find the FIRST and FOLLOW sets for each non-terminal in the below grammar
   S→Aab|Ba|ϵ
   A→aAb|ϵ
   B→bB|ϵ

4. a) Write about S-attributed definitions.
   b) Discuss various symbol table organization techniques.

5. Generate Three-Address code and write different implementation for the generated three-address code (a*b)+(c-d)*(a*b)+b.

6. a) Explain peephole optimization techniques in compilation process.
   b) Explain the different issues in the design of code generator.

7. a) List out all the difference between SDD and SDT.
   b) Explain Recursive descent parsing.

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FACULTY OF ENGINEERING

B.E. CSE (AI & ML) V - Semester (AICTE) (Main) (New) Examination, February/ March 2023

Subject: Compiler Design

Time: 3 Hours **Max. Marks: 70**

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1. a) Why should we study Compilers?
   b) Write short notes on Role of Lexical Analyzer.
   c) Give the syntax-directed definition for if-else statement.
   d) What are the various types of intermediate code representation?
   e) Define the term copy propagation.
   f) Explain the role of code generator in a compiler.
   g) Show DAG a:=b*-c+b*-c.

2. a) Explain the different phases of compiler & showing the output of each phase using the example for the statement a=b+c*60.
   b) Explain input buffering in detail.

3. a) What are the difficulties in top-down parsing? Explain in detail?
   b) Explain shift-reduce parsing technique? Consider the following grammar E-->E+E/E*E/(E)/id the input string id+id*id explain stack implementation shift-reducing parsing .

4. a) What is an ordered and unordered symbol table? What is the function of symbol table in the compilation process? Explain.
   b) Explain the run-time storage organization of a program.

5. a) Construct parse tree, syntax tree and annotated parse tree for the input string is 5*6+7;
   b) Draw the syntax tree and DAG for the expression (a*b)+(c-d)*(a*b)+b.

6. a) Explain flow-of-control optimization technique.
   b) State and explain different machine dependent code optimization techniques.

7. a) Explain various Global optimization techniques with an example.
   b) Explain characteristics of Peephole Optimization.

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