25/-

USN : 6th C.S. / common Q.P/Rs. 25/- Course Code : 18CS61

Sixth Semester B.E MAKEUP Examination, AUGUST_OCTOBER_2021

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Time: 3 hrs Max. Marks :100

Instructions :1. Answer any five full questions.

	L	CO	PO	M
1a. What Is Artificial Intelligence? Explain in brief its importance.	[2]	[1]	[1]	[5]
1b. Compare Strong AI and Weak AI methods.	[3]	[1]	[1]	[7]
1c. Demonstrate the Semantic Net with an example.	[3]	[1]	[2]	[8]
2a. For a problem of Missionaries and Cannibals in AI write the Operators and draw the Search tree without cycles having solution for the same.	[3]	[2]	[2]	[10]
2b. Write a note on Combinatorial Explosion and Problem reduction.	[2]	[1]	[1]	[10]
3a. Explain how searching helps in problem solving emphasizing on types of searches in AI.	[2]	[1]	[1]	[10]
3b. Demonstrate the working of Depth first search and Breadth first search algorithms by the use of either algorithm or pseudo-code for the same.	[3]	[2]	[2]	[10]
4a. List and Explain the properties of Search Methods.	[2]	[1]	[1]	[10]
4b. Explain with figure the three problems that could be faced by a HILL climbing algorithmic techniques.	[2]	[2]	[2]	[10]
5a. Demonstrate the use of Game trees in solving the tic-tac-toe problem. Draw the partial game tree for the same.	[3]	[2]	[2]	[10]
5b. Write a note on Alpha-beta Pruning emphasizing on its effectiveness and its implementation.	[2]	[1]	[1]	[10]
6a. State the deduction theorem and apply the same to prove the following. $\{A \rightarrow B\} \vdash A \rightarrow (C \rightarrow B)$	[3]	[2]	[2]	[10]
6b. Write a note on Soundness, Completeness, Decidability, Monotonicity.	[2]	[1]	[1]	[10]
7a. What is need of training in Machine Learning? Using a simple learning method derive a final hypothesis which is consistent for following training data: <slow, wind, 30ft, 0, evening, cold> <slow, rain, 20ft, 0, evening, warm> <slow, snow, 30ft, 0, afternoon, cold>	[3]	[3]	[2]	[10]

7b. Explain the candidate elimination technique and Meaning of Inductive bias.

[2] [3] [1] [10]

8a. Explain in brief the three types of learning methodologies in Artificial Neural Networks.

[2] [3] [1] [10]

8b. Demonstrate the working of simple perceptron to represent the learning of logical OR function for maximum 3 epochs.

[3] [3] [2] [10]

9a. Explain with an example the working of Probabilistic Reasoning and Joint Probability Distributions.

[2] [3] [1] [10]

9b. In the city of Cambridge, there are two taxi companies. One taxi company uses yellow taxis, and the other uses white taxis. The yellow taxi company has 90 cars, and the white taxi company has just 10 cars. A hit-and-run incident has been reported, and an eye witness has stated that she is certain that the car was a white taxi. Further suppose that experts have asserted that given the foggy weather at the time of the incident, the witness had a 75% chance of correctly identifying the taxi.
Given that the lady has said that the taxi was white, what is the likelihood that she is right?

[4] [3] [2] [10]

10a. Explain how learning happens in Simple Bayesian Concept Learning?

[2] [3] [1] [10]

10b. Write a note on Bayesian Belief Networks and The Noisy-V Function.

[2] [3] [1] [10]

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16CS/IS754

Seventh Semester B.E. Semester End Examination, Dec./Jan. 2019-20

ARTIFICIAL INTELLIGENCE

Time: 3 Hours Max. Marks: 100

Instructions: 1. Answer one full question each from the Units

UNIT - I

			L	CO	PO	M
1	a.	Explain Turing test and Chinese room argument experiment. Compare and contrast.	(2)	(3)	(2)	(10)
	b.	Convert the following information into semantic nets and frames: Tom is a cat. Tom caught a bird. Tom is owned by John. Tom is ginger in color. Cats like cream. The cat sat on the mat. A cat is a mammal. A bird is an animal. All mammals are animals. Mammals have fur.	(3)	(2)	(2)	(10)

OR

			L	CO	PO	M
2	a.	Explain the relationship between graphs, semantic nets, semantic trees, search spaces, and search trees.	(2)	(3)	(2)	(10)
	b.	Design a suitable representation and draw the complete search tree for the following problem. A farmer is on one side of a river and wishes to cross the river with a wolf, a chicken, and a bag of grain. He can take only one item at a time in his boat with him. He can't leave the chicken alone with the grain, or it will eat the grain, and he can't leave the wolf alone with the chicken, or the wolf will eat the chicken. How does he get all three safely across to the other side?	(5)	(3)	(2)	(10)

UNIT – II

			L	CO	PO	M
3	a.	Explain how you implement Depth First Search and Breadth First Search with example code. Compare both search techniques.	(2)	(3)	(2)	(10)
	b.	Explain with example how you use heuristics for search. Explain the criteria for selecting a good heuristic.	(2)	(3)	(2)	(10)

OR

			L	CO	PO	M
4	a.	Explain different techniques to identify optimal paths.	(2)	(3)	(2)	(10)
	b.	Implement a greedy-search algorithm. How well does it perform compared with the other methods you have implemented? Invent a 0-1 knapsack problem, and use your search tree implementation to model this problem. Can you model the fractional knapsack problem using a search tree?	(5)	(2)	(1)	(10)

UNIT – III

			L	CO	PO	M
5	a.	Explain the following terms (i) Game Trees (ii) Minimax (ii) Alpha beta pruning.	(2)	(2)	(3)	(12)
	b.	What is Logic? Explain Why Logic is used in Artificial Intelligence and explain Logical Operators.	(2)	(2)	(3)	(08)

OR

			L	CO	PO	M
6	a.	Explain the concepts of Translating between English and Logic Notation and explain the following Truth Tables of Not, And, Or, Implies, if, Complex Truth Tables.	(2)	(3)	(2)	(12)
	b.	Explain deduction Theorem with an example.	(2)	(4)	(4)	(08)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

UNIT – IV

			L	CO	PO	M
7	a.	Consider the following axioms and convert them to clausal form a) Every coyote chases some roadrunner. b) Every roadrunner who says ``beep-beep" is smart. c) No coyote catches any smart roadrunner. d) Any coyote who chases some roadrunner but does not catch it is frustrated. e) (Conclusion) If all roadrunners say ``beep-beep", then all coyotes are frustrated. Prove the conclusion If all roadrunners say ``beep-beep", then all coyotes are frustrated	(3)	(3)	(2)	(1
	b.	Explain with examples resolution in propositional logic.	(2)	(3)	(2)	(1

OR

8	a.	Explain with examples resolution in predicate logic.	(2)	(3)	(2)	(1
	b.	Explain with example backward chaining.	(2)	(3)	(2)	(1

UNIT –V

			L	CO	PO	M
9	a.	Explain black board architecture with its implementation.	(2)	(3)	(2)	(
	b.	Explain with example Dempster-Shafer theory of evidence.	(2)	(3)	(2)	(

OR

10	a.	List and explain properties of agents.	(2)	(1)	(2)	(
	b.	List and explain types of agents.	(2)	(1)	(2)	(

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15CS754

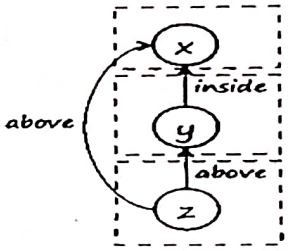
Seventh Semester B.E. Makeup Examination, January 2019
ARTIFICIAL INTELLIGENCE

Time: 3 Hours

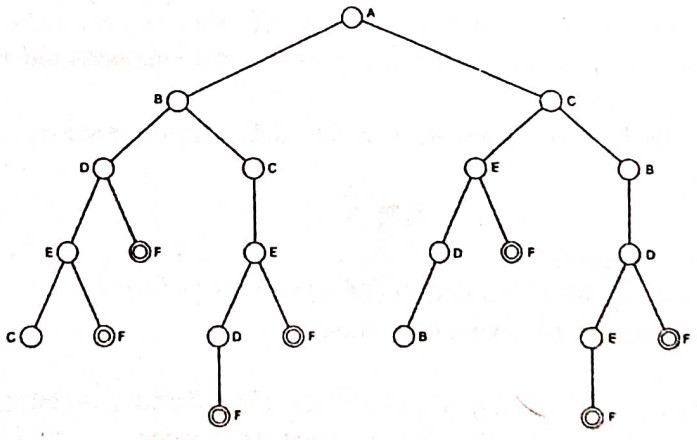
Max. Marks: 100

Instructions: 1. *Unit-I and Unit-II are compulsory*
2. *Answer any one full question from each of the remaining units.*

UNIT - I

		L	CO	PO	M
a.	Define a. Intelligence b. Artificial intelligence c. Strong Methods and Weak Methods	(1)	(1)	(1)	(06)
b.	Explain the Chinese Room argument, and a. present some of the arguments against it, and b. the counter-arguments. c. Which do you find most convincing? How does this affect your view on the overall worth of the study of Artificial Intelligence?	(2)	(2)	(1)	(06)
c.	Design Semantic net with appropriate frames for the following objects having relations each other:  	(3)	(3)	(2)	(08)

UNIT – II

		L	CO	PO	M
a.	Explain the differences and similarities between depth-first search and breadth-first search. Give examples of the kinds of problems where each would be appropriate. Mention the time and space complexity of depth-first search and breadth-first search.	(2)	(3)	(2)	(10)
b.	Write implementation of beam search in 'C' language. Analyze beam search for the following tree. 	(4)	(2)	(2)	(10)

UNIT - III

		L	CO	PO	M
a.	Prove the following: $\vdash (\forall \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (\forall \rightarrow D)))$	(3)	(2)	(1)	(06)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

b. Translate the following sentences in to predicate logic:
i) Marcus was a man
ii) All Pompeians were Romans
iii) Everyone is loyal to someone
iv) Marcus tried to assassinate Caesar
v) All men are people

(2) (2) (2) (10)

OR

4 a. Explain effectiveness of alpha-beta pruning algorithm. Explain how alpha-beta pruning algorithm is implemented with code.

(2) (3) (2) (10)

b. Prove the following:
a) $(\neg A \rightarrow B) \rightarrow (\neg B \rightarrow A)$
b) $(A \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (A \rightarrow D)))$

(3) (3) (1) (10)

UNIT - IV

L CO PO M

5 a. Solve the phrase to to get Conjunctive Normal Form (CNF): $(A \rightarrow B) \rightarrow C$

(3) (2) (2) (06)

b. Explain the Resolution Rule and using the Resolution Rule resolve $\{A, B), (\neg B, C)$

(2) (1) (1) (06)

c. Illustrate with block diagram and explain the architecture of an Expert System.

(2) (1) (1) (08)

OR

L CO PO M

6 a. Solve the phrase to to get Conjunctive Normal Form (CNF): $A \leftrightarrow (B \wedge C)$

(3) (2) (1) (06)

b. Explain the method of Proof by Reputation using an example.

(2) (2) (1) (06)

c. How to build an medical expert system using backward chaining in Rule-Based Expert System.

(1) (2) (1) (08)

UNIT - V

L CO PO M

7 a. Write a note on
i) Blackboard Architecture
ii) Copycat Architecture

(2) (3) (2) (10)

b. Explain Dempster Shafer Theory of evidence with an example

(2) (3) (2) (10)

OR

8 a. Explain properties of agents

(2) (1) (2) (10)

b. Explain with block diagram a three-layer subsumption architecture for an agent with suitable examples

(2) (1) (2) (10)

USN : _____ Course Code : 18CS62

Sixth Semester B.E MAKEUP Examination, AUGUST_OCTOBER_2021

COMPILER DESIGN

Time: 3 hrs Max. Marks :100

Instructions : Answer any five full questions.

	L	CO	PO	M

1a. Explain with a diagram the phases of a Compiler.Show the transition made by each of these phases for the statement a=b+c*5, where a , b and c are reals.

[1] [1] [1, 3] [10]

1b. Design a Lexical Analyzer in C++ to recognize the stream of tokens of C identifiers. Assume the suitable C++ functions to read the character, failure and retract(if necessary) operations.

[3] [1] [3] [10]

2a. What is the need for input Buffereing? Explain the buffer pairs scheme and its drawbacks.

[2] [1] [1] [8]

2b. Design the transition diagram and write the code for the start state, an intermediate state and a final state to recognize the tokens below:
i)Relational operator. ii)unsigned number

[3] [1] [3] [12]

3a. Give the algorithm for the Left Recursion .Analyse the given grammar ,eliminate Left recursion from the following grammar.
A→BC | a
B→CA |Ab
C→AB|CC|a

[3] [2] [3] [10]

3b. state the rules to compute First and Follow.Apply the same algorithm to compute the First and Follow for the given grammar.
E→ E+T | T
T→T*F | F
F→(E) | id

[2] [2] [1, 3] [10]

4a. Develop predictive parsing table for the following grammar ,show the moves made by the parser for the given input string (a,(a,a))
S →(L) | a
L →L , S | S

[3] [2] [3] [10]

4b. Develop an Algorithm to left factor a grammar .Give the left factored grammar for the following.
S→iEtS | iEtSeS|a
E→b

[3] [2] [1, 3] [10]

5a. Explain the working of Shift Reduce parser.Illustrate the configuration of a SR for the input using the grammar.
E-->T+E | T
T-->i

[3] [2] [3] [10]

5b. Analyse the given grammar and hence find LR(0) items
S→(S) S
S→Є

[3] [2] [3] [10]

6a. Check whether the following grammar is canonical LR by constructing LR(1) collectionfor the given grammar.
S->AaAb | BbBa
A->Є
B->Є

[2] [2] [3] [10]

6b. Explain the conflicts that occur during shift reduce parsing. Apply and Construct LALR(1) parsing table for the given grammar.
E->(E) | id

[2] [2] [3] [10]

7a. What is Syntax Directed Definition?Write the SDD for a simple desk calculator involving the operators + and *.Show the annotated parse tree for input 7+5*2n

[3] [3] [3] [10]

7b. Explain S attributed SDD , L-attributed SDD and Dependency graph definitions with examples

[2] [3] [2] [10]

8a. Write the SDD for constructing syntax trees for arithmetic expressions consisting of + and - operators.construct syntax tree for the following input:
a+b-c

[3] [3] [3] [10]

8b. Construct L attributed SDD for evaluating arithmetic expressions involving only * operator. construct the dependency graph for the input 2*5

[2] [4] [1] [10]

9a. Construct directed acyclic graph and value number method for the given expression
a + a * (b – c) + (b – c) * d

[3] [4] [3] [10]

9b. List and Explain the various issues in code generation phase

[2] [4] [1] [10]

10a. Apply the code generation algorithm to translate the basic block shown below
t = a- b
u = a – c
v = t + u
a = d
d = v + u
assume t , u , v are temporaries local to the block while a , b , c, d are variables that are line on exit from the block

[3] [4] [3] [10]

10b. Construct three address code and write its Quadruple , Triple and Indirect Triple three address representations
for the following statement
(a+b)*(c+d)-(a+b+c)

[3] [4] [3] [10]

USN : _____ Course Code : 16CS63

Sixth Semester B.E FASTTRACK Examination, AUGUST_SEPTEMBER_2021

COMPILER DESIGN

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

Instructions : Answer any five full Questions.

	L	CO	PO	M
1a. Explain with a diagram the phases of a Compiler. Show the transition made by each of these phases for the statement p=q + r * 60, where p , q and r are reals.	[2]	[1]	[1]	[10]
1b. Explain typical Language processing system with a neat diagram.	[2]	[1]	[1]	[6]
1c. Construct a transition diagram to recognize the following tokens.i) Integer constant ii) Identifier.	[2]	[1]	[1]	[4]
2a. What is the need for input buffering ? Explain the buffer pairs scheme and its drawbacks	[2]	[2]	[2]	[10]
2b. Explain with a neat diagram the interaction between Lexical Analyser and the parser.	[2]	[2]	[1]	[6]
2c. What are the applications of a Compiler? Explain.	[2]	[2]	[1]	[4]
3a. Give the algorithm for the Left Recursion .Analyse the given grammar ,eliminate Left recursion from the following grammar. E→E+T | T T→T*F |F F→(E)|id	[3]	[2]	[2]	[10]
3b. state the rules to compute First and Follow.Apply the same to compute First and Follow. E→ E+T | T T→T*F | F F→(E) | id	[3]	[2]	[3]	[10]
4a. Write an Algorithm to left factor a grammar .Give the left factored grammar for the following. S→iEtS | iEtSeS | a E→b	[3]	[2]	[2]	[10]
4b. Develop predictive parsing table for the following grammar ,show the moves made by the parser for the given input string (a,(a,a)) S →(L) | a L →L , S | S	[3]	[2]	[3]	[10]
5a. Construct SLR parsing table for the given grammar. S→AS A→SA|a	[3]	[3]	[3]	[10]
5b. Construct LALR parsing table for the given grammar. S'→S S→CC C→cC | d	[2]	[3]	[1]	[10]
6a. Analyse the grammar and hence find LR(0) items S→(S) S				

S→ϵ

Explain the working of Shift reduce parser.

[4] [2] [3] [10]

6b. Write an algorithm for constructing SLR parsing table and hence Explain the conflicts of Shift reduce parsing with suitable examples

[2] [2] [2] [10]

7a. Explain the parser stack implementation of postfix SDT with an example.
Construct directed acyclic graph for the expressiona + a * (b – c) + (b – c) * d

[3] [2] [2] [10]

7b. Explain the following with an example
i) Quadruples ii) Triples iii) Indirect Triples

[2] [2] [2] [10]

8a. Write syntax directed definition for flow of control statements.
Construct a dependency graph for the declaration float id1 , id2 , id3

[2] [2] [2] [10]

8b. Write annotated parse tree for 6 * 5 + 7m using top down approach . write semantic rules for each.

[2] [2] [3] [10]

9a. Apply the code generation algorithm to translate the basic block shown below
t = a- b
u = a – c
v = t + u
a = d
d = v + u
assume t , u , v are temporaries local to the block while a , b , c, d are variables that are line on exit from the block

[3] [3] [3] [10]

9b. List and Explain the various issues in code generation phase

[2] [3] [2] [10]

10a. What is SDD? Write SDD for a simple desk calculator involving the operators + and * . Show the Annotated parse tree for input 6+7*3n

[3] [3] [3] [10]

10b. Construct three address code and write its quadruple , Triple and Indirect Triple three address representations fo the statement (a+b)*(c+d)-(a+b+c)

[2] [3] [2] [10]

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16CS63/15CS63

Sixth Semester B.E. Semester End Examination, May/June 2018-19

COMPILER DESIGN

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Answer five complete questions. Units I and V are compulsory. Answer any one question from each of the remaining units.*
2. *Provide examples, wherever needed.*

UNIT – I (Compulsory)

		L	CO	PO	M
a.	Explain with a neat diagram, the phases of a compiler. Show the translation of the input statement: **position = initial * 60** (Assume the variables position and initial to be floats)	(2)	(1)	(1)	(10)
b.	Design a lexical analyzer in C++ to recognize an unsigned number. The design should include regular expression / regular definition, transition diagram and C++ implementation code.	(6)	(1)	(3)	(10)

UNIT – II

		L	CO	PO	M
a.	Consider the Context free grammar S→ SS+ | SS* | a And the string w= aa+a* a. Give a leftmost derivation for the string b. Give a rightmost derivation for the string c. Give a parse tree for the string d. Is the grammar ambiguous or unambiguous ? Justify e. Describe the language generated by the above grammar	(2)	(1)	(12)	(10)
b.	What is Left Factoring and why it is required during top down parsing? Write Algorithm for making the grammar left factored. Left factored the following grammar. S → iEtS | iEtSeS | a E→ b	(2)	(1)	(12)	(10)

OR

a.	Give the rules for constructing FIRST and FOLLOW sets. Compute FIRST and Follow functions for the grammar: S -> A C B | C b B | B a A -> d a | B C B -> g | ϵ C -> h | ϵ	(3)	(2)	(2)	(10)
b.	Write an algorithm to construct a predictive parsing table. Construct the predictive parsing table by making necessary changes to the grammar: E -> E + T | T T -> T * F | F F -> (E) | id	(3)	(2)	(2)	(10)

UNIT – III

		L	CO	PO	M
a.	Explain the working of a shift reduce parser. Illustrate the configurations of a shift-reduce parser for the input: id*id and Using the grammar: E → E+T | T T → T*F | F				

$F \rightarrow (E) \mid id$

State the conflicts that may arise during shift reduce parsing.

(3) (2) (1,3) (08)

b. Construct SLR Parsing Table for the following grammar:

$S \rightarrow AA$

$A \rightarrow Aa \mid b$

Show the moves made by the parser on input: **bab**

(3) (2) (3) (12)

OR

5 a. What is LR(k) class of grammars? Explain the model along with the algorithm used for LR Parsing.

(2) (2) (1) (10)

b. Construct canonical sets of LR(1) items for the following grammar

$S \rightarrow AA$

$A \rightarrow Aa \mid b$

(6) (2) (3) (10)

L CO PO M

UNIT – IV

6 a. What is a Syntax Directed Definition (SDD)? Write the SDD for a simple desk calculator involving operators + and *. Show the annotated parse tree for input: **8*3+6n**

(3) (3) (1,3) (10)

b. Write the SDD for constructing syntax trees for arithmetic expressions consisting of + and - operators only. Construct syntax tree for: **a – 4+c**

(3) (3) (3) (10)

OR

7 a. Write L-attributed SDD for evaluating arithmetic expressions involving only * operator. Construct the dependency graph for input:**5*6**

(3) (3) (3) (10)

b. Construct Three-Address Code and Write its Quadruple, Triple and Indirect Triple three-address representations for the following statement:

a = b * - c + b * - c

(4) (3) (1,3) (10)

L CO PO M

UNIT –V (Compulsory)

8 a. List and explain in brief, various issues in code generation phase.

(2) (4) (1) (10)

b. What are basic blocks and flow graphs? Write the algorithm for partitioning three address instructions into basic blocks.

(2) (4) (1) (10)

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16CS63

Sixth Semester B.E. Makeup Examination, May/June 2018-19

COMPILER DESIGN

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *UNIT-I & UNIT-V are compulsory*
2. *Answer any one full question from remaining each UNITS.*

UNIT – I (Compulsory)

			L	CO	PO	M
1	a.	Explain various phases of compiler with a neat diagram.	(2)	(1)	(12)	(10)
	b.	Write the transition diagram along with program code for recognizing relational operators.	(3)	(1)	(1)	(10)

UNIT – II

			L	CO	PO	M
2	a.	What is a Context Free Grammar? When is a grammar ambiguous? Illustrate ambiguity in the following grammar using the input: **id * id + id** **E →E + E | E * E | (E) | id** Construct the unambiguous grammar for the above ambiguous grammar.	(4)	(2)	(1,3, 12)	(10)
	b.	What grammar transformations are needed to make a grammar suitable for top down Parsing? Explain with relevant example(s) why these transformations are needed. Apply them to make the following grammar suitable for top down parsing: **S → SS+ | SS* | a**	(3)	(2)	(1,3)	(10)

OR

			L	CO	PO	M
3	a.	What is a Recursive Descent Parser (RDP)? Write the procedure for a nonterminal in RDP. Show the trace for input: **cad** using the grammar: **S →cAd** **A → ab | a**	(3)	(2)	(1,3)	(10)
	b.	Check whether the following grammar is LL(1) without constructing the table. Further validate the answer by constructing the predictive parsing table. **S →AaAb | BbBa** **A → ε** **B → ε**	(5)	(2)	(3)	(10)

UNIT - III

			L	CO	PO	M
4	a.	Explain the working of shift reduce parser. Explain the conflicts of shift reduce parsing with suitable example.	(2)	(2)	(12)	(10)
	b.	Construct the canonical LR(1) Item sets for the following grammar: S -> S A | A A -> a	(3)	(2)	(2)	(10)

OR

			L	CO	PO	M
5	a.	Write a schematic of LR parser. Write the canonical collection of set of LR(0) items for the following grammar: E -> E + T | T T -> T * F | F F -> (E) | id	(3)	(2)	(2)	(10)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

b. Construct LALR parser for the following grammar using LR(1) items:

S' -> S
S -> C C
C -> e D | d

(4) (2) (2) (10)
L CO PO M

UNIT - IV

6 a. Explain the parser stack implementation of postfix SDT with an example.

(2) (3) (12) (10)

b. Develop SDD to produce directed acyclic graph for an expression. Show the steps for constructing the directed acyclic graph for the expression: a + a * (b - c) + (b - c) * d.

(3) (3) (3) (10

OR

7 a. Give the SDD for simple desk calculator and draw dependency graph for the expression: 1 * 2 * 3 * (4 + 5) n.

(3) (3) (3) (10

b. Explain the common three-address instruction forms.

(2) (3) (12) (10
L CO PO M

UNIT –V (Compulsory)

8 a. Discuss the various issues in the design of a code generator.

(2) (4) (12) (1

b. Generate intermediate code and identify basic blocks for the following program segment:

```
for i from 1 to 10 do
    for j from 1 to 10 do
        a[i,j] = 0.0;
for i from 1 to 10 do
    a[i,i] = 1.0;
```

(3) (4) (3) (1

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15CS63

Sixth Semester B.E. Semester End Examination, May / June 2018

COMPILER DESIGN

Time: 3 Hours

Max. Marks: 100

Instructions:
1. *UNIT IV and V are compulsory.*
2. *Answer any ONE full question from remaining each unit.*
3. *Assume any missing information.*

UNIT – I

1 a. Explain the typical language processing system with a neat diagram **08 M**

(Level [2], CO [1], PO [1])

b. Illustrate the Compilation of the statement **P = I+ R* 60 (P, I, and R are all float values)** for each phase of the Compilation process. **12 M**

(Level [2], CO [1], PO [3])

OR

2 a. With neat diagram demonstrate the interaction between lexical analyzer and the parser. Explain input buffering scheme. **08 M**

(Level [2], CO [1], PO [1])

b. Construct a transition diagram to recognize the relational operators of C language and design a Lexical Analyzer in C++ using techniques suitable for hand implementation to recognize the relational operators. Assume the suitable C++ functions to read the character, failure and retract(if necessary) operations **12 M**

(Level [3, 6], CO [1], PO [3])

UNIT – II

3 a. Construct predictive parsing table for the following grammar after applying necessary transformations. **12 M**

$S \rightarrow (L) \mid a$

$L \rightarrow L, S \mid S$

Show the moves made by the parser on input: **(a, a)**

(Level [6,2], CO [2], PO [3,5])

b. Illustrate ambiguity in the following grammar: **08 M**

$E \rightarrow E + E \mid E * E \mid (E) \mid id$

Eliminate ambiguity from the above grammar.

(Level [2], CO [2], PO [1,3])

OR

4 a. Explain the model along with the algorithm used for table driven Predictive Parsing. Outline the error-recovery strategies employed by a parser. **12 M**

(Level [2], CO [2], PO [1])

b. Prove that the following grammar is not LL(1) without constructing the parsing table. **08 M**

$S \rightarrow iEtSS' \mid a$

$S' \rightarrow eS \mid \varepsilon$

$E \rightarrow b$

(Level [3], CO [2], PO [3,5])

UNIT – III

5 a. Explain the model of LR parser with parsing Algorithm. 10 M

(Level [2], CO [2], PO [1])

b. How would you define LR (0) item ? Construct canonical sets of LR(0) items and GOTO graph for the following grammar. 10 M

S→AS | b
A→SA | a

(Level [1, 5], CO [2], PO [1, 3])

OR

6 a. Define Handle and Handle pruning? Demonstrate the process of identifying the handle using Handle pruning with the grammar **E→ E+E | E*E | (E) | id** on the following input string. 08 M

w=id*(id + id)

(Level [1, 3], CO [2], PO [1, 3])

b. How would you define LR(1) item ? Construct canonical sets of LR(1) items and GOTO graph for the following grammar. 08 M

S→ CC
C→eC | d

(Level [1, 5], CO [2], PO [1, 3])

c How is an ambiguous grammar handled by LR parser? 04 M

(Level [1], CO [2], PO [1])

UNIT – IV

7 a. What is a Syntax Directed Definition (SDD)? Define Synthesized and Inherited attributes. Write the SDD for a simple desk calculator involving operators + and *. Show the annotated parse tree for input: **10+15*4n** 12 M

(Level [1,2,3], CO [4], PO [1,3])

b. Construct Three-Address Code and represent the same using Quadruples , Triples and Indirect Triple, for the following statement: 08 M

a = b * - c + b * - c

(Level [5,6], CO [4], PO [1,3])

UNIT –V

8 a. Describe the various issues in the design of Code generator. 08 M

(Level [1], CO [4], PO [1])

b. Outline Simple code generator algorithm and Demonstrate the instructions generated along with the changes in the **Register and Address descriptor** for the following Basic block consisting of three address code statements. 12 M

t=a – b
u=a – c
v=t + u
a=d
d=v + u

(Level [2, 4], CO [4], PO [5, 12])

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15CS63

Sixth Semester B.E. Makeup Examination, June 2018

COMPILER DESIGN

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

Instructions: 1. *Units IV and V are compulsory. Answer any one question from each of the remaining units.*
2. *Provide examples, wherever needed.*

UNIT – I

1 a. Explain with a neat diagram, the phases of a compiler. Show the translation of the input statement: position = initial + rate * 60 (Assume position, initial and rate to be floats) **14 M**

(Level [2], CO [1], PO [1])

b. Design a lexical analyzer in C++ for relational operators of 'C' programming language. **06 M**

(Level [6], CO [1], PO [3])

OR

2 a. Show with a neat diagram, the interaction between a lexer and a parser. **12 M**
Define the terms: token, pattern and lexeme. Identify the tokens generated for the 'C' input: while (I < 10)

(Level [1,2,3], CO [1], PO [1,3])

b. Compare the two schemes for input buffering used by a lexer. **08 M**

(Level [2], CO [1], PO [1])

UNIT – II

3 a. What is Left Recursive grammar and how would you eliminate it? Apply the technique and eliminate left recursion from the following Grammar. **06 M**

S→AS | b
A→SA | a

(Level [1,3], CO [2], PO [3, 5])

b. Explain the model of predictive parser with parsing Algorithm. **06 M**

(Level [2], CO [2], PO [1,3])

c. Design the parsing table for predictive parser for the following grammar and verify the grammar to be LL(1). **08 M**

S→iEtS | iEtSeS | a
E→b

(Level [3, 4], CO [2], PO [3])

OR

4 a. Consider the grammar **06 M**

S→ a | ^ | (T)
T→ T, S | S

Show the Leftmost and Rightmost derivation for the following sentence . (a,(a, a))

(Level [2], CO [2], PO [3])

b. Explain Recursive-Descent parsing algorithm and discuss the difficulties to implement Recursive Descent Parser. **06 M**

(Level [2], CO [2], PO [1])

c. What is Left Factoring? Explain the algorithm for Left factoring the grammar G. Apply the technique and left factor the following grammar. **08 M**

$S \rightarrow aS \mid Aa \mid Bb$
$A \rightarrow \underline{a}bB \mid \underline{a}B \mid cdg \mid cdeB \mid cdfB$
$B \rightarrow b$

(Level [2, 3], CO [2], PO [3])

UNIT – III

5 a. Construct SLR Parsing Table for the following grammar: 12 M

$S \rightarrow SS+ \mid SS* \mid a$

Show the moves made by the parser on input: aa*a+

(Level [6,2], CO [2], PO [3,5])

b. Explain the working of a Shift Reduce Parser. Show with suitable examples the conflicts that may occur during shift reduce parsing. 08 M

(Level [2], CO [2], PO [1])

OR

6 a. What is an LR(1) item? Construct canonical LR(1) collection of items and the Automaton for the following grammar: 12 M

$S \rightarrow CC$
$C \rightarrow aC \mid d$

(Level [1,6], CO [2], PO [1,3,5])

b. Compare LL and LR Parsing methods. Also Compare the different kinds of LR parsers 08 M

(Level [2], CO [2], PO [1])

UNIT – IV

7 a. How would you define Syntax Directed Definition? Construct semantic rules for the following grammar and show the annotated parse for the string 3+5*4n 06 M

L⟶ En
E⟶E+T
E⟶T
T⟶T*F
T⟶F
F ⟶ (E)
F⟶ digit

(Level [1, 3], CO [3], PO [1, 3])

b. What is DAG? Construct a DAG, Three address code, Quadruple and Triple representation for the following expression. 10 M

a + a * (b-c) + (b-c) *d.

(Level [1, 3], CO [4], PO [1, 3])

c Construct the semantic rules for translation of while statement of C language. 04 M

(Level [3], CO [3], PO [1, 3])

UNIT –V

8 a. Explain in brief, various issues in code generation phase. 10 M

(Level [2], CO [4], PO [1])

b. Explain the following with suitable examples: 10 M

Basic Blocks
Flow graphs

(Level [2], CO [4], PO [1])

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15CS63

B.E. Fasttrack Semester Examination, July / August 2018

COMPILER DESIGN

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *UNIT IV & V are Compulsory.*
2. *Answer any one full question from remaining each UNITS.*
3. *Assume any missing information*

UNIT – I

1 a. What are the difference between Compiler and interpreter **04 M**

(Level [1], CO [1], PO [1])

b. What is meant by Input buffering? Write an algorithm for Look ahead code with sentinels **06 M**

(Level [1], CO [1], PO [1])

c. With neat diagram explain the various phases of Compiler. **10 M**

(Level [1], CO [1], PO [1])

OR

2 a. With suitable example explain the role of LEXICAL ANALYSER in the compilation process and interaction between parser. **08 M**

(Level [2], CO [1], PO [3])

b. Construct Transition diagram for token **IDENTIFIER** of C language and design a lexical analyzer in C++ using techniques suitable for hand implementation to recognize the same. Assume suitable C++ functions to read, failure and retract operations. **12 M**

(Level [3, 6], CO [1], PO [3,5])

UNIT – II

3 a. What is an Ambiguous Grammar? Verify the following grammar to be ambiguous on the input: **id + id * id.** **08 M**

E→ E + E | E * E | E – E | E / E | (E) | id

(Level [2], CO [2], PO [3, 5])

b. What is Left Recursion? Give the Algorithm to eliminate left recursion. Apply the Algorithm and eliminate the left recursion for the following grammar. **12 M**

$$E \rightarrow E + T \mid T$$
$$T \rightarrow T * T \mid F$$
$$F \rightarrow (E) \mid id$$

(Level [3], CO [2], PO [3, 5])

OR

4 a. Given the grammar **12 M**

S→ i E t S | i E t S e S

E→ b

i. What is left factoring? Left factor the above grammar

ii. Define FIRST and FOLLOW symbols and Construct FIRST and FOLLOW sets for above grammar

(Level [3], CO [2], PO [3, 5])

b. Explain the model of Predictive Parser with Parsing Algorithm. **08 M**

(Level [2], CO [2], PO [1])

UNIT – III

5 a. What is Handle and Handle Pruning ? Show the working of Shift Reduce Parser for accepting the input string w= **id + id * id$** by considering the following grammar. 10 M

$E \rightarrow E + T \mid T$
$T \rightarrow T * T \mid F$
$F \rightarrow (E) \mid id$

(Level [3], CO [2], PO [1,3])

b. Explain the working Model of LR parser with Parsing Algorithm 10 M

(Level [1], CO [2], PO [1]

OR

6 a. What is LR(0) item in SLR parser? Construct canonical sets of LR(0) items for the following grammar. 10 M

$A \rightarrow (A) \mid a$

(Level [1, 5], CO [2], PO [1, 3])

b. Give the Algorithm to build the collections of sets of valid LR(1) items along with two procedures CLOSURE and GOTO 10 M

(Level [1], CO [2], PO [1])

UNIT – IV

7 a. Define Synthesized Attribute and Give SDD for simple calculator and Draw the Annotated parse tree for expression 3*5 + 4n 12 M

(Level [1, 2], CO [3], PO [1, 3])

b. What is DAG? Construct the DAG for the following expression 08 M

i. a + b + a + b
ii. a + a * (b – c) + (b – c) * d

(Level [5, 6], CO [3], PO [1, 3])

UNIT –V

8 a. Discuss the following terms 10 M

i. Basic Blocks
ii. Next USE information
iii. FLOW graph

(Level [1], CO [4], PO [1])

b. With an example explain the **finding common sub expression** and Dead **Code elimination** in code optimization. 10 M

(Level [2], CO [4], PO [3, 5])

USN : _____ Course Code : 18CS63

Sixth Semester B.E MAKEUP Examination, AUGUST_OCTOBER_2021

EMBEDDED SYSTEMS AND IOT

Time: 3 hrs Max. Marks :100

Instructions : Answer any FIVE full questions

	L	CO	PO	M
1a.Define Embedded Computing System. Explain the Characteristics of Embedded Computing Applications.	[2]	[1]	[1]	[6]
1b. Illustrate the significance of use of Microprocessors in digital design.	[2]	[1]	[1]	[6]
1c. Explain the embedded system design process with a case study.	[2]	[1]	[1]	[8]
2a. List and explain the challenges in Embedded computing System Design.	[2]	[1]	[1]	[6]
2b. Explain with a neat diagram the sample requirement form.	[2]	[1]	[1]	[6]
2c. Compare & Contrast Top down & bottom up design.	[3]	[1]	[1]	[8]
3a. List and explain the various data types of 8051 in 'C'.	[2]	[2]	[1]	[6]
3b. Develop an 8051 'C' program to send values of –4 to +4 to port P1.	[3]	[2]	[1,2]	[6]
3c. Develop an 8051 C program to get a byte of data form P1, wait ½ second, and then send it to P2.	[3]	[2]	[1,2]	[8]
4a. List out the various logical operators and bit wise operators of 8051 in 'C' and explain with one example for each.	[2]	[2]	[1,2]	[6]
4b. Develop an 8051 C program to get bit P1.0 and send it to P2.7 after inverting it.	[3]	[2]	[1,2]	[6]
4c. Develop an 8051 C program to convert ASCII digits of '4' and '7' to packed BCD and display them on P1 and P2.	[3]	[2]	[1,2]	[8]
5a. With a neat diagram explain TMOD register.	[2]	[2]	[2]	[6]
5b. Calculate the machine cycle frequency and time period for the XTAL frequency given below: a) 11.0592 MHz b) 22 MHz	[3]	[2]	[1,2]	[6]

5c. Develop an 8051 C program to toggle only bit P1.5 continuously every 50 ms. Use Timer 0, mode 1 (16-bit) to create the delay. [3] [2] [2] [8]

6a. Explain with a neat block diagram the characteristics and working of Timer0 in Mode2. [2] [2] [2] [6]

6b. Develop an 8051 C program to toggle only pin P1.5 continuously every 250 ms. Use Timer 0, mode 2 (8-bit auto-reload) to create the delay. [3] [2] [2] [6]

6c. Develop an 8051 C program to transfer the message "YES" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously. [3] [2] [2] [8]

7a. Explain in detail a generic block diagram of an IoT Device.. [2] [4] [5] [6]

7b. Illustrate an example of IoT Service that uses Publish-Subscribe communication model. [2] [4] [5] [6]

7c. Illustrate the Home Automation IoT application w.r.t.
a) Smart Lighting and
b)smart Appliances [2] [4] [5] [8]

8a. With a neat diagram explain the functional blocks of IoT. [2] [4] [5] [6]

8b. Briefly explain any two IoT levels. [2] [4] [5] [6]

8c. Describe in brief any two IoT enabling Technologies. [2] [4] [5] [8]

9a. With a neat block diagram, explain the basic building blocks of an IoT device. [2] [4] [1, 3] [6]

9b. Explain the various Raspberry Pi interfaces. [2] [4] [1, 3] [6]

9c. Develop a python code for blinking a LED with a Raspberry Pi. [3] [4] [1, 3] [8]

10a. Explain the various features of Raspberry Pi board . [2] [4] [1, 3] [6]

10b. Develop a program to illustrate the Interfacing of LED and switch with Raspberry Pi. [3] [4] [1, 3] [6]

10c. Write a note on Linux on Raspberry Pi. [2] [4] [1, 3] [8]

USN : _____ Course Code : 18IS53

Fifth Semester B.E FASTTRACK Examination, AUGUST_SEPTEMBER_2021

INTERNET OF THINGS

Time: 3 hrs Max. Marks :100

Instructions :1. Answer any FIVE full Questions.

	L	CO	PO	M
1a. What is an embedded computer system? Outline complex systems and microprocessors.	[1]	[1]	[1]	[10]
1b. Explain BMW 850i brake and stability control system (ABS), with block diagram and working principle.	[1]	[1]	[1]	[10]
2a. Explain Characteristics of Embedded Computing Applications.	[2]	[1]	[1]	[10]
2b. Interpret Challenges in Embedded Computing System Design	[2]	[1]	[1]	[10]
3a. Define Internet of Things. List Characteristics of Internet of Things.	[1]	[2]	[1]	[10]
3b. Explain generic block diagram of an IoT.	[2]	[2]	[1]	[10]
4a. Explain IoT protocols.	[2]	[2]	[1]	[10]
4b. Illustrate with block diagram, any two IoT levels / deployment templates.	[2]	[2]	[1]	[10]
5a. Explain IoT Key Features, List Advantages & Disadvantages of IoT systems.	[2]	[3]	[1]	[10]
5b. Outline Domain Specific IoTs: 1.Home Automation,2.Cities, 3.Environment, 4.Energy	[2]	[3]	[1]	[10]
6a. Summarize Domain Specific IoTs: 1.Logistics, 2.Agriculture, 3.Industry,4.Health and Lifestyle.	[2]	[3]	[1]	[10]
6b. Demonstrate with reference to Internet of Things: 1.Hardware and Software2.Sensors, 3.Smart Wearable Devices, 4.Standard Devices..	[2]	[3]	[1]	[10]
7a. Explain Architecture Reference Model.	[2]	[4]	[1]	[10]
7b. Explain the Protocols: 1.6LowPAN,2.RPL, 3.CoAP, 4.MQTT.	[2]	[4]	[1]	[10]
8a. Illustrate Device Discovery capabilities: Registering a device, De-register a device.	[2]	[4]	[1]	[10]
8b. Outline Intel IoTivity, XMPP Discovery extension.	[2]	[4]	[1]	[10]
9a. Explain Cloud Storage models and communication APIs.	[2]	[5]	[1]	[10]
9b. Explain Web server for IoT and Cloud for IoT.	[2]	[5]	[1]	[10]
10a. Explain Python web application framework and designing a RESTful web API.	[2]	[5]	[1]	[10]
10b. Explain Amazon Web services for IoT.	[2]	[5]	[1]	[10]

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16CS/IS74

Seventh Semester B.E. Makeup Examination, January 2020
EMBEDDED SYSTEMS & INTERNET OF THINGS

Time: 3 Hours | Max. Marks: 100

Instructions: 1. *Answer one full question from each of the units*
2. *Assume any Missing Data*

UNIT - I

			L	CO	PO	M
1	a.	Define Embedded Computing System. Discuss the Characteristics of Embedded Computing Applications.	(1)	(1)	(1)	(10)
	b.	List the challenges in Embedded computing System Design & Discuss any two in detail.	(4)	(1)	(2)	(10)

OR

2	a.	Give an overview of embedded system design process with a case study.	(2)	(1)	(1)	(10)

	b.	Illustrate ARM assembly code to implement the following C assignments
		a. $z = a*(b + c) - d*e$
		b. `if (i == 0)`
		`{`
		`i = i +10;`
		`}`
			(3)	(1)	(2)	(10)

UNIT – II

			L	CO	PO	M
3	a.	Define IoT & explain its characteristics.	(2)	(2)	(2)	(10)
	b.	Discuss in detail a generic block diagram of an IoT Device	(3)	(2)	(1)	(10)

OR

4	a.	List the various IoT Protocols & explain any five in brief	(1,2)	(2)	(1)	(10)
	b.	With a neat diagram explain & analyze the various communication models.	(4)	(2)	(2)	(10)

UNIT - III

			L	CO	PO	M
5	a.	Identify IoT key features. List advantages and disadvantages of IoT.	(2)	(2)	(1)	(08)
	b.	Explain IoT Hardware and Software.	(2)	(2)	(1)	(06)
	c.	Explain IoT Technology , Protocols, and Common applications of IoT	(2)	(2)	(1)	(06)

OR

6	a.	Explain six Smart City concepts using IoT.	(2)	(2)	(1)	(08)
	b.	Explain three Environment concepts using IoT.	(2)	(2)	(1)	(06)
	c.	Explain three Energy concepts using IoT.	(2)	(2)	(1)	(06)

UNIT - IV

			L	CO	PO	M
7	a.	Explain in brief steps involved in IoT System design methodology with a neat diagram	(2)	(4)	(2)	(10)

	b.	What is an IoT Device; discuss the Basic building blocks of an IoT device.	(3)	(4)	(5)	(1(

OR

8	a.	Explain in brief Case Study on IoT System for Weather Monitoring	(2)	(4)	(2)	(1(
	b.	Explain with a neat block diagram Home Automation web application	(2)	(4)	(5)	(1(

			L	CO	PO	M

UNIT -V

9	a.	Discuss the key concepts of Web Application Messaging Protocol (WAMP)	(2)	(4)	(2)	(1
	b.	Explain with a neat block diagram, WAMP Session between client & router	(2)	(4)	(5)	(1

OR

10	a.	Explain in detail the salient features of Xively Cloud for IoT	(2)	(4)	(5)	(1
	b.	Discuss the key features of Python Web Application Framework-Django	(2)	(4)	(5)	(1

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16CS/IS74

Seventh Semester B.E. Semester End Examination, Dec./Jan. 2019-20
EMBEDDED SYSTEMS AND INTERNET OF THINGS

Time: 3 Hours

Max. Marks: 100

Instructions:
1. *Answers must be brief and to the point.*
2. *Suitable data may be assumed, with better reasoning.*
3. *Draw diagrams, wherever necessary.*
4. *Write question number properly.*

UNIT - I

			L	CO	PO	M
1	a.	What is an embedded computing system? Describe the design of BMW 850i Brake and Stability Control System.	(1)	(1)	(1)	(06)
	b.	Summarize the characteristics of embedded computing applications and the Challenges involved in the design of such system	(2)	(1)	(1)	(06)
	c.	Explain the process of embedded system design with an example of a GPS Moving Map.	(2)	(1)	(1)	(08)
		OR				
2	a.	Solve x = (a + b) – c using C assignments using ARM instruction.	(3)	(1)	(2)	(06)
	b.	What is the necessity of power consumption embedded system design? List and review the power characteristics of C-MOS.	(2)	(1)	(1)	(06)
	c.	Demonstrate how the CPU performance can be enhanced using 1. Pipelined execution of ARM instructions. 2. Pipelined execution of multi-cycle ARM instructions.	(2)	(1)	(1)	(08)

UNIT – II

			L	CO	PO	M
3	a.	Explain IoT Link Layer Protocols, with its stack diagram.	(2)	(3)	(1)	(08)
	b.	Compare Microprocessor and Microcontroller.	(2)	(2)	(1)	(06)
	c.	Explain the ~~basics~~ fundamentals of Sensors and actuators.	(2)	(2)	(1)	(06)
		OR				
4	a.	Illustrate IoT Communication Models, with a neat block diagrams.	(1)	(4)	(1)	(10)
	b.	Contrast all 6 IoT Levels, with sketches and features.	(2)	(3)	(1)	(10)

UNIT - III

			L	CO	PO	M
5	a.	IoT Key Features,Advantages & Disadvantages	(2)	(3)	(2)	(10)
	b.	List & explain the following in brief a) IoT Hardware b) IoTSoftware	(1,2)	(3)	(2)	(10)
		OR				
6	a.	Explain Technologies & Protocols of IoT	(2)	(3)	(1)	(10)
	b.	Illustrate the Home Automation IoT application	(3)	(3)	(2)	(10)

			L	CO	PO	M

UNIT - IV

7 a. Explain the purpose and requirement specification in IoT design process considering Home automation as an example. (3) (1) (1) (08)

b. Explain the domain model specification in IoT design process considering considering Home automation as an example. (2) (1) (1) (06)

c. Describe IoT Design Methodology for information model specification (2) (1) (1) (06)

OR

8 a. Illustrate IoT Design Methodology with respect to Logistics applications (3) (1) (1) (08)

b. Explain IoT Design Methodology with respect to Retail applications. (2) (1) (1) (06)

c. What is an IoT Device? Explain Basic building blocks of an IoT Device, with neat diagram. (2) (2) (3) (06)

			L	CO	PO	M

UNIT -V

9 a. What is Xively Cloud? Explain how data can be uploaded to Xively Cloud with a documented python code. (2) (3) (2) (10)

b. Explain WAMP AutoBahn for IoT. (2) (3) (2) (10)

OR

10 a. What is Django Architecture? Explain briefly how you create a Django project. (2) (3) (2) (08)

b. Illustrate Designing a RESTful Web API. (2) (3) (2) (06)

c. Rewrite the python program for stopping an EC2 instance. (2) (3) (2) (06)

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15CS/IS74

Seventh Semester B.E. Makeup Examination, January 2019

EMBEDDED SYSTEM DESIGN AND INTERNET OF THINGS

Time: 3 Hours Max. Marks: 100

Instructions: 1. *Unit I and Unit IV are compulsory.*
3. *Data, if necessary, may be assumed.*
4. *Sketches, when required, may be drawn.*

UNIT - I

			L	CO	PO	M
1	a.	Explain the embedded system design process with the help of a block diagram.	(2)	(1)	(1)	(08)
	b.	Construct and write the requirement chart for GPS moving map system.	(3)	(2)	(2)	(05)
	c.	Develop the ALP to evaluate the following expression using ARM7 assembly programming $Z = (a << z) \mid (b \& 15)$	(3)	(2)	(2)	(07)

UNIT – II

			L	CO	PO	M
2	a.	Explain the features of four IoT protocols used in Link Layer laid by IEEE.	(2)	(1)	(1)	(06)
	b.	Contrast all 4 IoT Communication Models.	(2)	(1)	(1)	(06)
	c.	Illustrate IoT level-6 deployment template with block diagram.	(2)	(1)	(1)	(08)

OR

			L	CO	PO	M
3	a	Explain the Characteristics of an IoT System.	(2)	(1)	(1)	(06)
	b	Explain REST – based communication APIs, with block diagram.	(2)	(1)	(1)	(06)
	c	Illustrate IoT level-5 deployment template with block diagram.	(2)	(1)	(1)	(08)

UNIT - III

4	a.	Define the terms sensors and actuators. Explain any one sensor and an actuator that you know.	(2)	(2)	(2)	(06)
	b.	Explain the communication interfaces for data transfer available in Raspberry Pi.	(2)	(2)	(1)	(06)
	c.	Build a Python program for Raspberry Pi to send an email on pressing of a switch.	(3)	(3)	(3)	(08)

OR

5	a.	What is GPIO header? Explain the use of the same in Raspberry Pi.	(2)	(2)	(2)	(06)
	b.	Develop a Python code on Raspberry Pi to demonstrate controlling of a LED with a switch.	(3)	(3)	(2)	(08)
	c.	Explain briefly about any two single board computers other than Raspberry Pi that you know	(2)	(2)	(2)	(06)

UNIT - IV

			L	CO	PO	M
6	a.	Explain 6LowPAN Protocol.	(2)	(1)	(1)	(10)
	b.	Explain IPv6 Routing Protocol for Low-Power and Lossy Networks (RPL)Protocol.	(2)	(1)	(1)	(10)

Note: L (Level),CO (Course Outcome), PO (Programme Outcome), M (Marks)

			L	CO	PO	M
		UNIT - V				
7	a.	What is WAMP? Explain the key concepts of WAMP.	(2)	(4)	(3)	(06)
	b.	Explain the procedure to setup a MySQL database and configure it with Django project	(2)	(4)	(3)	(07)
	c.	Explain the Django view that retrives data from Xively cloud with suitable example.	(2)	(4)	(3)	(07)
		OR				
8	a.	What is Django? Briefly explain its architecture.	(2)	(4)	(3)	(06)
	b.	Explain the python code for sending data to Xively cloud with a suitable example.	(2)	(4)	(3)	(07)
	c.	Explain about the Amazon Web Services for IoT.	(2)	(4)	(3)	(07)

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15CS/IS74

Seventh Semester B.E. Semester End Examination, Dec/Jan 2018-19
EMBEDDED SYSTEMS AND INTERNET OF THINGS

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Unit- I and Unit – IV are compulsory.*
2. *Attempt any one question from remaining units.*

UNIT - I

			L	CO	PO	M
1	a.	Explain Challenges in embedded computing system design.	(2)	(1)	(1)	(06)
	b.	Explain Characteristics of embedded computing applications	(2)	(1)	(1)	(06)
	c.	Define an embedded computer system? Explain example for BMW 850i Brake and Stability Control System.	(3)	(2)	(2)	(08)

UNIT – II

			L	CO	PO	M
2	a.	Define IoT. Explain the important characteristics of IoT.	(2)	(1)	(1)	(04)
	b.	Explain the four IoT communication models.	(2)	(1)	(1)	(08)
	c.	Illustrate any two levels of IoT systems with suitable example applications.	(2)	(1)	(1)	(08)
		OR				
3	a.	Illustrate the generic block diagram of an IoT device.	(2)	(1)	(1)	(06)
	b.	Explain the two IoT communication APIs	(2)	(1)	(1)	(07)
	c.	Summarize the important features of any two enabling technologies of IoT	(2)	(1)	(1)	(07)

UNIT - III

			L	CO	PO	M
4	a.	Define an IoT device? Explain Block diagram of an IOT Device.	(2)	(3)	(1)	(06)
	b.	Develop python programs for: i. switching LED on / off from Raspberry Pi Console. ii. for switching LED / Light based on LDR reading.	(3)	(3)	(2)	(06)
	c.	Explain Raspberry Piboard with various components, peripherals & status LEDs.	(2)	(4)	(3)	(08)
		OR	L	CO	PO	M
5	a.	ExplainRaspberry Pi frequently used commands.	(2)	(2)	(3)	(08)
	b.	Explain Raspberry Pi interfaces.	(2)	(2)	(3)	(04)
	c.	Develop python programs for: i. for blinking LED. ii. controlling an LED with a switch.	(3)	(3)	(2)	(08)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

UNIT - IV

			L	CO	PO	M
6	a.	Explain the IoT architectural reference model with suitable block diagram	(2)	(2)	(1)	(08)
	b.	What is 6LoWPAN? List its features	(1)	(2)	(3)	(06)
	c.	Explain the MQTT protocol for IoT.	(2)	(3)	(2)	(06)

UNIT -V

			L	CO	PO	M
7	a.	Explain key concepts of Web Application Messaging Protocol (WAMP), with a session between Client and Router.	(2)	(1)	(1)	(10)
	b.	i. Explain Publish-subscribe messaging using WAMP-AutoBahn, ii. WAMP protocol commands for installing AutoBahn.	(2)	(1)	(1)	(10)

OR

			L	CO	PO	M
8	a.	Explain designing a RESTful Web API, with necessary python code for Django model & Django views for Weather Station.	(2)	(1)	(1)	(10)
	b.	What is the use of Amazon S3? Develop a python code for uploading a file to an S3 cloud storage.	(2)	(1)	(1)	(10)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)