Total No. of Pages 2

Roll No.....

VI-SEMESTER
END SEMESTER EXAMINATION

B.Tech.(CO)
May- 2019

CO-302 Compiler Design

Time: 3:00 Hours

Max. Marks: 40

Note: Attempt any five questions

Q.No. 1

A. Construct SLR (1) parsing table and compute FIRST & FOLLOW for the following grammar: [6]

S→xAy|xBy|xAz
A→ aS /q
B→ q

B. Eliminate Left recursion from following grammar [2]

S→A
A→ Ad|Ae|aB|aC
B→bBC| f
C→g

Q.No. 2

A. Design predictive parsing table for the following grammar an differentiate between top down and bottom up parsing. [4

S → X
X → aY|Xd
Y→ bYZ /f
Z→ g (where 'S' is start symbol)

B. How LALR is different from CLR? explain and find canonical collection sets of LR(1) items for following grammar [4

S → Aa| bAc |dc |bda
A → d

Q.No. 3

Eliminate loop invariant computations and construct program flo graph for the following program fragment [8

```
Fact(x) {
int f=1;
for(i=2; i<=x; i++)
f=f*i
return (f) }
```

Q.No. 4

A. Translate the following expression into three address instructions

x:= - y * (a+b)

Also give quadruple and triple representation of the same? [4]

B. Generate three address code for the following program fragment [4]

```
while(x<y and u<v) do
if x=1 then y=y+1
else
while x<=v do
x=x+3
```

Q.No. 5

A. Write SDD for generating three address code for Boolean expressions with &&, || (OR) and ! Operators. [4]

B. What is DAG? Construct DAG for the expression [4]

(((a + a) + (a + a)) + ((a + a) + (a + a)))

Q.No. 6

A. Explain the midsquare method and folding method used for generating hash values. [4]

B. Differentiate between common sub-expression elimination and dead code elimination with example and also discuss code motion with suitable example [4]

Q.No. 7

A. Explain error recovery strategies adopted by complier. [4]

B. Explain following with suitable examples

a. Ambiguous grammar and cross compiler [4]

b. LEX and YACC

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

VITH SEMESTER **B.TECH. [CSE]**

END SEMESTER EXAMINATION (MAY. - 2019)

CO-304ARTIFICIAL INTELLIGENCE

Time: 3:00 Hours **Max. Marks: 50**

Note: Attempt any five questions.
All diagrams and pseudocode should be neat and clean.
Assume suitable missing data, if any.

Q1(a) Explain different project characteristics and analyze the problem characteristics for robot moving a desk from one room to another? [5]

(b) Suppose two friends live in different cities on a map, such as the Romania map as shown in fig.1. On every turn, we can simultaneously move each friend to a neighboring city on the map.The amount of time needed to move from city i to neighbor j is equal to the road distance d(i, j) between the cities, but on each turn the friend that arrives first must wait untilthe other one arrives (and calls the first on his/her cell phone) before the next turn can begin.We want the two friends to meet as quickly as possible. Take the heuristic functions as 2 *D(i, j). Write the pseudo code for the problem using best first search and apply that on the problem to decide among the heuristic function. Assume one friend is at Oradea and other is at Neamt. [5]

Q2(a) Consider the given graph (Refer fig. 2) that represents an AND-OR graph. The terminal nodes are labelled SOLVED indicated by doubled rectangle and have zero cost. The arcs (all of them labeled 1) represent the cost of transforming the problem. Values associated with nodes are heuristic estimates of solving that node. Simulate the exploration of graph by AO^* algorithm till it terminates. Show how the graph looks at the end of each cycle. Assume FUTILITY value of 45. Clearly mark the final solution (by double-lined arcs) in the final graph. for this question. [5]

(c) Define alpha beta cut-offs? Show how the algorithm Alpha Beta explores the given game tree, searching from left to right. Refer Figure 3 [5]

(i) Fill in the leaves that are inspected by AlphaBeta.Show the cutoffs and label them with their type.

(ii)Mark the move that AlphaBeta will choose for MAX at the root.

Q3. (a) Consider the following facts:

i. All students who are intelligent or hard working pass the exam.
ii. All students who pass the exam and have good communication skill get placement.
iii. Gaurav is intelligent and has good communication skill
iv. Gautam is neither intelligent nor hard working. **[10]**

(b)

(i) Represent theses sentences as wff.
(ii) Using backward chaining prove that Gautam does not get placed.
(iii) Convert them to clause form indicating the law used.
(iv) Explaining steps of resolution, prove that gaaurav gets placed

Q4. (a) Every vehicle is a physical object consisting of engineand fuel system. Vehicles can be land vehicles having wheels, water vehicles having swimming system or air vehicles having flying wings. Land Vehicle can be road vehicle or railway vehicle. Air vehicle can be aircraft or space vehicle. Water vehicle can be river vehicle or sea vehicle. Road Vehicles can be cars having four wheels, or scooters having two wheels auto having three wheels. All cars have air condition and safety belt. Honda City is a car having 10 years of free service. Bajaj is a scooter having good average in terms of fuel. INS Vikrant is an instance of sea vehicle. MIG-21 is and instance of air craft. Dl-10c..3145 is an instance of car having red colour and model 2018.Represent the above knowledge using (i)Semantic Net and (ii) Semantic frame Write down the corresponding prolog representation and prolog rules to answer following queries.

a. Maruti has four wheels?
b. Vikrant cannot fly. **[10]**

Q5. (a) Describe the general architecture of expert system? How will you evaluate expert system like MYCIN? **[5]**

(b) Assume universe of discourse for the set of salary structures (in terms of K) per month is defined as U = {2, 5, 10, 20, 30, 40, 50, 60, 70, 80}. The Fuzzy sets defined on U based on salaries are:

Poor = {(2,1), (5,1), (10, 0.8), (20, 0.5), (30, 0.2)}

CIIO

Total No. of Pages 02 Roll No:

VI SEMESTER B.Tech. [Col]

SUPPLIMENTARY EXAMINATION May- 2019

Paper Code: CO-306 Title of Paper: Computer Networks

Time: 3:00 Hours Max. Marks : 40

Note : Answer any FIVE questions. All Questions Carry equal marks
Assume suitable missing data, if any.

Q.1

A) What are the various layers of OSI model? Compare and contrast OSI model with TCP/IP model

B) Explain connection establishment and release using 3-way handshaking in transport layer

Q.2

A) What are the functions of Data link layer? A channel has a bit rate of 4kbps and a propagation delay of 20 msec. For what range of frame sizes does stop-and-wait give an efficiency of at least 50 percent?

B) Explain the Bus, Star, Ring, Hybrid and Tree network topologies giving their advantages and disadvantages.

Q.3

(A) Explain pure and slotted aloha in detail.

(B) What is Ethernet 802.3 standard? Discuss in detail the frame format and the channel access method used.

Q.4

(A) Compare different classes of IPv4 in terms of netid and hostid. What are the advantages and disadvantages of classfull addresses?

(B) What are the different types of error detection methods? Write the steps to compute the Checksum in CRC code. if the frame is 110101011 and generator is x4 + x+1 what would be the transmitted frame?

Q.5

A) Explain in detail TCP header format.

B) Explain distance vector algorithm with suitable example .

Q.6

A) What is cryptography? Discuss various methods of cryptography. Explain substitution &transposition encryption with suitable example and also discuss the working of Data Encryption Standards (DES).Explain distance vector algorithm with suitable example .

B) Explain working of RSA algorithm for encryption and decryption and also find cipher text corresponding to plain text M=9, also generate Public key and Secret key using RSA algorithm by taking two prime numbers p=11 and q=23.

Q.7 Write short notes on the following

a) Piggy back and Sliding Window Syndrom.
b) IPv6 address structure
c) DNS
d) Digital signature using public-key cryptography

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

SIXTH SEMESTER ~140~ **B.Tech. [CSE]**

END SEMESTER EXAMINATION ***(MAY - 2019)***

CO-318 ***ADVANCED DATABASE MANAGEMENT SYSTEMS***

Time: 3:0 Hour ***Max. Marks: 40***

Note: Answer ***ANY FIVE*** questions

Assume suitable missing data, if any.

Q1 (a) Explain Type Inheritance and describe how it can be utilize to create a relation. [4]

(b) Consider the following relational schema. [4]

Students(rollno: integer, sname: string)

Courses(courseno: integer, cname: string)

Registration(rollno: integer, courseno: integer, percent: real)

Write a query in SQL and in relational algebra to find the distinct names of all students who score more than 90% in the course numbered 107?

Q2 (a) Write a procedure to register a student for a course section. [4]

(b) Explain various mobile transaction models in detail. [4]

Q3 (a) Discuss the database management issues involved in designing mobile, genomic and multimedia databases. [4]

(b) Describe data replication along with their advantages & disadvantages. [4]

Q4 (a) What factors could result in skew when a relation is partitioned on one of its attributes by: [2X4=8]

(i) Hash partitioning?

(ii)Range partitioning?

In each case, what can be done to reduce the skew?

Q5 **(a)** What is a view? How views are implemented? [4]

(b) Write down the following queries in Relational Algebra. [4]

Suppliers (sno, sname, pincode, city) Parts (pno, pname, color, weight) Projects (projno, projname, city) and shipments (sno, pno, projno)

(i) Get supplier name and city for suppliers who supply to any project with a yellow colored part.

(ii) Get the project names which are supplied by supplier 'ABC' and 'XYZ'.

Q6 Differentiate between the following: [4x2=8]

(a) Dynamic SQL and Embedded SQL
(b) Recovery and atomicity
(c) Real-Time and Long-Duration transactions
(d) Spatial and Geographic data

Q7 Write short notes on: [4+4]

a) Remote Backup System
b) Storage of XML data

[b] Show the mechanism of simulated annealing algorithm to avoids trapping in local optima. Give appropriate mathematical equations. **[5]**

[c] Describe the exploitation and exploration phenomenon in Particle Swarm Optimization (PSO) along with adequate mathematical expressions. **[5]**

----END----

Total No. of Pages 04 *Roll No. .....*

SIXTH SEMESTER **B. Tech. (CSE)**

END SEMESTER EXAMINATION ***May-2019***

CO324 PATTERN RECOGNITION

Time: 3:00 Hours ***Max. Marks: 50***

Note: Answer ***ALL*** questions.
Assume suitable missing data, if any.
USE ONLY OPTIMAL NUMBER OF WORDS TO ANWER

1[a] A former requires an automated pattern recognition system to segregate apples into two categories: Good, and Average. Give (briefly) steps and model of such pattern recognition. [Use block diagram to explain] **[2]**

[b] A surveillance system is designed to detected intruders. The probability of occurrence of intrusion is 0.05. There may be two type of error is detection: surveillance system detects an intruder, and there is no intruder (Type-I error), it fails to detect and there is an intruder (Type-II error). Let the probability of surveillance system detecting an intruder given there is no intruder is 0.1, and probability of surveillance system does not detect any intruder given there is an intruder is 0.01. Find the probability of Type-I error, Type-II error, probability of surveillance system detects an intruder, and the probability of presence of an intruder given surveillance system has detected an intruder. **[2+2+2+2]**

2. Answer *any TWO* of the followings

[a] Consider two nonnegative numbers a and b, and show that, if $a \leq b$, then $a \leq (ab)^{1/2}$. Use this result to show that, if the decision regions of a two-class classification problem are chosen to minimize the probability of misclassification, this probability will satisfy **[5]**

$$p(mistake) \leq \int \{p(x, C_1)\, p(x, C_1)\}^{1/2} dx$$

[b] Data is collected from a restaurant for various cooks, customers, and cuisines and food is labelled as tasty or not tasty. The data shown in Table-I. Design a Naïve Bayes classifier to predict taste of food if Cook = Shyam, Mood = Bad and Cuisine = Continental. **[5]**

Table-I

Cook	Mood	Cuisine	Taste
Shyam	Bad	Indian	Tasty
Shyam	Good	Continental	Tasty
Anu	Bad	Indian	Not Tasty
Anu	Good	Indian	Tasty
Uma	Bad	Indian	Tasty
Uma	Bad	Continental	Not Tasty
Anu	Bad	Continental	Not Tasty
Uma	Good	Continental	Not Tasty
Uma	Good	Indian	Tasty
Anu	Good	Continental	Tasty

[c] A common issue in the design of pattern recognition systems is of noisy and missing feature. Briefly discus a strategy to deal with noisy and missing features. **[5]**

3. Answer *any TWO* of the followings

[a] Compute the principal axes of the distribution. The covariance matrix of the distribution is given as **[5]**

$$\Sigma = \begin{bmatrix} 2.0 & 0.8 \\ 0.8 & 0.6 \end{bmatrix}$$

[b] Let x have an exponential density **[5]**

$$p(x|a) = \begin{cases} ae^{-ax}, & x \geq 0 \\ 0, & otherwise \end{cases}$$

Suppose that m samples are drawn independently according to p(x|a). Derive the equation of maximum likelihood estimate for a.

[c] Values of feature x of 45 randomly selected samples are shown in Table-II for each class A, class B. Obtain probability density estimation for both classes using histogram method [Consider interval of 1]. Also, find decision boundary if both the classes are equiprobable. **[5]**

Table-II

Values of feature x for 45 randomly selected samples of class A														
0.27	0.31	1.40	1.61	1.64	1.64	2.67	2.85	2.96	2.97	2.17	2.17	3.38	3.67	3.73
3.83	3,99	3.06	3.10	3.12	4.18	4.20	4.23	4.27	4.27	4.39	4.40	4.46	4.47	4.61
4.64	4.89	4.96	5.12	5.15	5.33	5.33	5.47	5.64	6.85	6.99	6.29	6.42	7.53	7.70
Values of feature x for 45 randomly selected samples of class B														
3.54	3.88	4.24	4.30	4.30	4.70	4.75	4.97	5.21	5.42	5.60	5.77	5.87	6.94	6.95
6.04	6.05	6.15	6.19	6.21	6.33	6.41	6.43	6.49	6.52	6.58	7.60	7.63	7.65	7.75
7.90	7.92	7.03	7.08	7.28	7.29	7.33	8.42	8.43	8.46	8.62	8.67	8.68	9.68	9.78

4. Answer *any TWO* of the followings

[a] Explain the concept of soft clustering (*be crisp in your answer*). From the data given in Table-II cluster all data points with the help of k-means clustering algorithm. Use Euclidean distance as the similarity measure and point A and B as the initial centroids. Solve for maximum 3 iterations. **[5]**

Table-III

Label	X	Y
A	185	72
B	170	56
C	168	60
D	179	68
E	182	72

[b] Find the clusters using complete link technique for the data shown in Table-IV. Use Euclidean distance, and draw dendogram. **[5]**

Table-IV

Label	X	Y
A	0.40	0.53
B	0.22	0.38
C	0.35	0.32
D	0.26	0.19
E	0.08	0.41

[c] A perceptron can be used to classify linear separable data. Design a classifier using combination of such perceptron to classify a dataset with two classes, class A: $[0, 0]^T$, $[1, 1]^T$ and class B: $[0, 1]^T$, $[1, 0]^T$. Use sigmoid function as the activation function. **[5]**

5[a] Answer *any TWO* of the followings

Use perceptron learning rule to train the network. The input training vectors are as follows: $X_1 = [\,1 \;\; -2 \;\; 0 \;\; 1\,]^T$, $X_2 = [\,0 \;\; 1.5 \;\; -0.5 \;\; -1\,]^T$ and $X_3 = [\,-1 \;\; 1 \;\; 0.5 \;\; -1\,]^T$. The initial weight vector is $[\,1 \;\; -1 \;\; 0 \;\; 0.5]^T$, The learning rate is 0.1 and the desired outputs are $d_1 = -1$, $d_2 = -1$ and $d_3 = 1$. Calculate the weight after one complete cycle. The activation function is given by: **[5]**

$$s(t) = \begin{cases} 1, & t \geq 0 \\ -1, & otherwise \end{cases}$$

Total No. of Pages 2

Roll No. .....

SIXTH SEMESTER

B.Tech. (SE)

END SEMESTER EXAMINATION

May-2019

CO326 OBJECT ORIENTED SOFTWARE ENGINEERING

Time: 3 Hours

Max. Marks: 40

Note: Question No. 1 is compulsory.
Attempt any **THREE** from the remaining questions.
Assume suitable missing data, if any.

Q1. Answer all the following questions:

i. What is the significance of rounds in the spiral model?

ii. Explain modifiability in requirement specification.

iii. Define the term cohesion in the context of the object-oriented design of systems.

iv. Define aggregation and generalization with an example.

v. Explain sequence diagram with an example.

[2*5=10]

Q2.

i. Mention the models in the analysis phase of the Rumbaugh Methodology and explain their roles for describing the system.

ii. Compare iterative model and incremental model in view of following parameters: user involvement, requirement change, maintenance, knowledge of developers, within budget.

[5+5=10]

Q3.

i. How UML diagrams constructive for the development of a typical software system? Explain state chart diagram with a suitable reason considering the example of employee information system.

P.T.O →

ii. Consider a program which takes a date as an input and checks whether it is a valid date or not. Its input is a triple of day, month and year with the values in the following ranges:

1<=month<=12

1<=day<=31

2000<=year<=2070

Generate boundary value analysis test cases.

[5+5=10]

Q4.

i. Explain the expected benefits of using CASE tools for software system developers and software maintenance teams.

ii. Explain Halstead's software science metrics. How can we estimate program length?

[5+5=10]

Q5.

i. Consider the database application project with the following characteristics:

a. The application has 45 key classes.

b. A graphical user interface is required.

Calculate the effort to develop such a project given 20 person days.

ii. Explain the Fountain model with the help of a diagram. What is the significance of arrows within the circle in this model? Also, list the advantages and disadvantages of this model.

[5+5=10]

END

Total No. of Pages 02 *Roll No. .....*

EIGTH SEMESTER **B.Tech.**

END SEMESTER EXAMINATION ***MAY-2019***

CO404 DATA WAREHOUSING AND DATA MINING

Time: 3:00 Hours *Max. Marks: 40*

Note: Answer **FIVE** questions. Question No. 1 is compulsory. Assume suitable missing data, if any.

1. Attempt any 4:

[a] What is Metadata and it's significance in Data Warehouse?

[b] What are Hypercubes?

[c] Define Data Warehousing and Data Mining? List various application area of data mining.

[d] What do you understand by Cross-Validation? What is its significance?

[e] Explain KDD. (3*4=12)

2.[a] How does the Naïve Bayesian classification works? Explain in detail.

[b] What are the major features of Star schema? How it is different from Snow Flake Schema? Justify with an example. (3+4)

3.[a] What are various Data Reduction strategies. Explain any three.

[b] Explain Dissimilarity matrix and Minkowski distance. Suppose m= {0, 0, 2, 0, 0, 2, 0, 3, 0, 5} and n= { 1, 0, 1, 0, 1, 1, 0, 2, 0, 3}, here m and n are two term-frequency vectors. Compute Cosine similarity between the two vectors. (3+4)

P.T.O.

4. [a] Why is tree pruning useful in decision tree induction? What is drawback of using a separate set of tuples to evaluate pruning?

[b] Suppose that we want to select between two prediction models, M1 and M2. We have performed 10 rounds of 10-fold cross-validation on each model, where the same data partitioning in round i is used for both M1 and M2. the error rates obtained for M1 are 30.5, 32.2, 20.7, 20.6, 31.0, 41.0, 27.7, 26.0, 21.5, 26.0. The error rates for M2 are 22.4, 14.5, 22.4, 19.6, 20.7, 20.4, 22.1, 19.4, 16.2, 35.0. Comment on whether one model is significantly better than the other considering a significant level of 1%.

5. [a] Consider the following points:
A1(2, 10), A2(2,5), A3(8,4), B1(5,8), B2(7,5), B3(6,4), C1(1,2), C2(4,9).
Using euclidean distance and A2, B2, C2 as initial centroids. With K-means clustering show the final 3 clusters.

[b] Compare and contrast K-means and DBSCAN. (3+4)

6.[a] What are the characteristics of k-nearest neighbor algorithm? Why it is called lazy learner?

[b] Explain various past decision support systems? Why they failed to provide strategic information? (3+4)

7. Differentiate between the following: (3+2+2)
[a] ROLAP and MOLAP
[b] Nominal and Ordinal attributes
[c] Fact Table and Dimension Table

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Total No. of Pages 2

Roll No.....

VI-SEMESTER
END SEMESTER EXAMINATION

B.Tech.(CO)
May- 2018

CO-302 Compiler Design

Time: 3:00 Hours

Max. Marks: 40

Note: Attempt any five questions

Q.No. 1

A. How LALR is different from CLR? Construct LALR (1) parsing table for the following grammar: [6]

S→AA
A→ aA /b

B. Eliminate Left recursion from following grammar [2]

S→aBDh
B→Bb | c
D→EF
E→g | ϵ
F→f | ϵ

Q.No. 2

A. Compute FIRST and FOLLOW sets for the following grammar

D → T L;
L → id M;
M→ id M /ϵ
T→ int / float (where 'ϵ' denotes epsilon) [4]

B. Design a DFA with input alphabet {a,b} for the language [2x2=4]

i) $L= \{w \in (a,b)^* : n_b(w) \bmod 3 > 1\}$

Where $n_b(w)$ is number of b's in w

ii) $L= \{ab^5 w b^4 : w \in (a,b)^*\}$

Q.No. 3

Write the S-attributed SDD for implementation of an assignment statement and show the stack implementation for x:= a* b+c with a=5, b=6 and c= 2. [8]

Q.No. 4

A. Translate the following expression into three address instructions

a:= - b * (c+d)

Also give quadruple and triple representation of the same? [4]

B. Write S-attributed definition for constructing a syntax tree for an assignment statement and Write down the structure of a typical activation record. [4]

Q.No. 5

A. Write SDD for generating three address code for Boolean expressions with &&, || (OR) and ! Operators. [4]

B. What is LEX ? How it is different from YACC tool. [4]

Q.No. 6

A. Explain the midsquare method and folding method used for generating hash values. [4]

B. Differentiate between common sub-expression elimination and dead code elimination with example and also discuss elimination of local common subexpression [4]

Q.No. 7

A. Explain error recovery strategies adopted by complier. [4]

B. Enlist the problems with the following grammar

$E \rightarrow E+E$, $E \rightarrow E*E$, $E \rightarrow id$

Also rectify them to make it suitable for LL (1) parsing? [4]

Total No. of Pages:2 *Roll No. ... .*

SIXTH SEMESTER **B.Tech. [CSE]**

END SEMESTER EXAMINATION *(MAY- 2018)*

CO-318 *ADVANCED DATABASEMANAGEMENT SYSTEMS*

Time: 3:0 Hour *Max. Marks: 40*

Note: Answer ***ANY FIVE*** questions

Assume suitable missing data, if any.

Q1(a) Describe the server system architectures with the help of transaction server and data server system? [4]

(b) Explain the terms nested-loop join and block nested-loop join with the help of an example? [4]

Q2 **(a)** Discuss the relative advantages of centralized and distributed databases. [4]

(b) Define the terms buffer management system and checkpoints. [4]

Q3 Stable storage cannot be implemented

(a) Is the statement correct? Justify. [4]

(b) Explain how database systems deal with this problem? [4]

Q4 **(a)** What is TP-Monitor? Explain TP-Monitor architecture with the help of different models and diagrams? [4]

(b) Define long duration transaction [4]

P.T.O

Q5 (a) Consider the following relational schema. [4]

Students(rollno: integer, sname: string)
Courses(courseno: integer, cname: string)
Registration(rollno: integer, courseno: integer, percent: real)

Write a query in SQL and in relational algebra to find the distinct names of all students who score more than 90% in the course numbered 107?

(b) What are the problems encountered in DDBMS while considering concurrency control and recovery? [4]

Q6 Differentiate between the following: [4x2=8]

(a) Spatial and Geographic data
(b) Homogeneous and Heterogeneous databases
(c) Recovery and atomicity
(d) 2PC and 3PC commit protocols

Q7 Write short notes on: [4+4]

(a) Real-time transaction system
(b) E-commerce

-END-

Total No. of Pages: 3 *Roll No.....*

VITH SEMESTER **B.Tech.(Computer Engineering)**
END SEMESTEREXAMINATION **(May 2018)**

CO 304 **ARTIFICIAL INTELLIGENCE**
Paper Code
Time: 3 Hours **Max. Marks: 50**

Note: Attempt total 5 questions. Q1 is compulsory

Q1. Answer following to the point.

a. Differentiate between solution steps recoverable and non recoverable? Illustrate with examples.
b. Explain the concept of knowledge acquisition and Inferential procedure in knowledge representation scheme.
c. State Bayes theorem and support with example for statistical reasoning.
d. What are the different techniques for non monotonic reasoning?
e. Explain rule based expert system

(5 X 2)

Q2.(a) Consider the graph in *Figure 1*, the node A is the start node and nodes J, G and R are goal nodes. The tree is being searched by DFS, BFS and DFID algorithm (searching left to right) Write the sequence of nodes inspected bythem till termination. Mention and show each and every step involved.

(b) As you get close to graduating MIT, you decide to do some career planning. *Figure 2* at end shows a graph of your options where the start node is M = MIT and your goal node is R = Retire, with a bunch of options in between. Your graph includes edge distances that represent, roughly, the "cost of transition" between these careers (don't think too hard about what this means). You also have heuristic node-to-goal distances which represent your preconceptions about how many more years you have to work until you retire. For example, you think it will take 25 years to go from MIT (M) to retirement (R), 30 years from Grad School (B), but only 2 years from Entrepreneur (E). Mention A* algorithm and Apply A* to find a respective career path after MIT till retirement.

A = Wall Street | B = Grad School | C = Professor | D = Government | E = Entrepreneur

[6,4]

Q3. (a) Draw the Grundy Game Tree with seven coins. Explain using this game tree how player maximize and minimize decide their move

(b) For the graph in *Figure 3* find the max value at the root node by applying mini max search. Also do alpha beta pruning. Choose and highlight the best strategy for the graph.

[5,5]

Q4. Consider the following sentences:

a. Shiva, Gopal and Madhu are people.
b. Shiva likes all kind of food..
c. Any thing any one eats and is not killed is a food.
d. If you are killed you are not alive.
e. Madhu eats everything Gopal eats.
f. Gopal eats peanuts and is still alive.
g. Apple is a food

a. Represent theses sentences as wff.
b. Using backward chaining prove that (i) Shiva eats apple and (ii) shiva like peanut.
c. Convert them to clause form indicating the law used.
d. Explaining steps of resolution to prove that Madhu eats peanut.

[2,2,3,3]

Q5. Construct the semantic net representations for the following text:

All Moving vehicles have fuel system and engine. All moving vehicles are ground or water vehicles. Car, Scooter, Truck are ground Vehicles which have breaks and water vehicles have navigation system. Scooter is two wheeler, car is four wheeler and truck is large four wheeler. All cars have air condition and safety belts. Maruti Swift is a car Swift car has 10 years free service of spare parts. Dl-12c 7788 is swift car having black color

a. Illustrate the steps of infer procedure to show that above car has safety system
b. Construct the semantic frame representation and give prolog implementation.

[5,5]

Q6. (a)) What are the steps to build Expert system such as Medical diagnostic system.

(b) What are the contents of knowledge Base in Expert system.

(c) For following fuzzy sets, find their Union, Intersection and also find union of their complements sets

$$A = \left\{\frac{1}{2.0} + \frac{0.65}{4.0} + \frac{0.5}{6.0} + \frac{0.35}{8.0} + \frac{0}{10.0}\right\}$$

$$B = \left\{\frac{0}{2.0} + \frac{0.35}{4.0} + \frac{0.5}{6.0} + \frac{0.65}{8.0} + \frac{1}{10.0}\right\}.$$

[4,3,3]

Q7. Write short notes on following (Any two)

(a) Conceptual Dependency
(b) Different phases of Natural Languge processing
(c) Learning using Neural Network or Genetic algorithm.
(d) Forward reasoning inference and Backward reasoning inference in Prolog

-180-

[5,5]

[5,5]

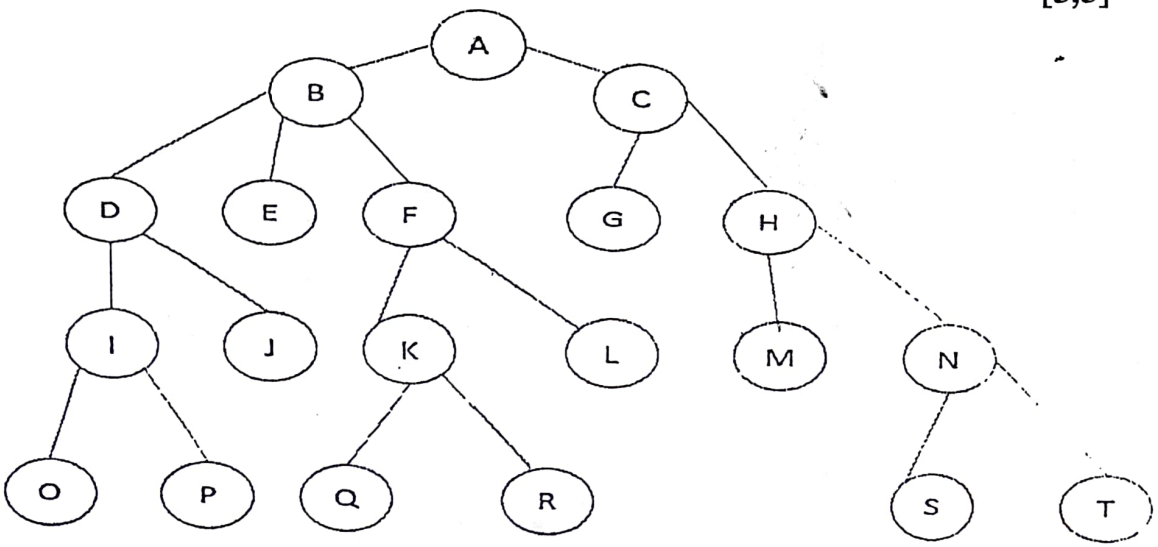


Figure 1

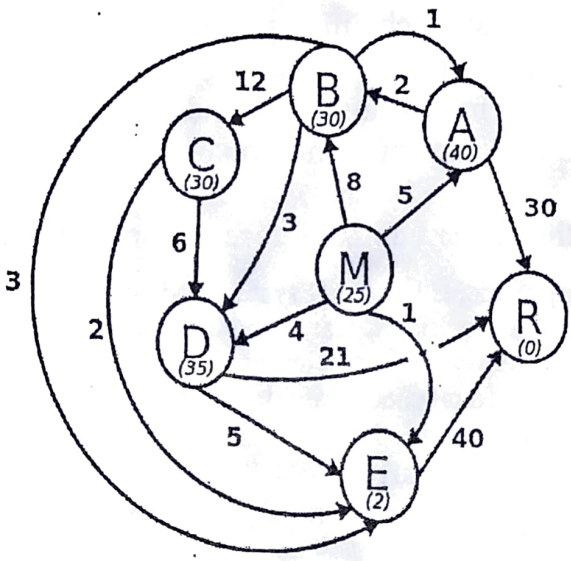


Figure 2.

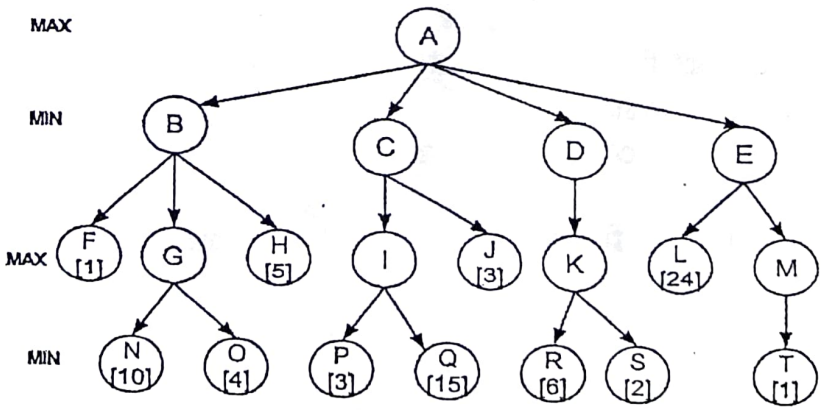


Figure 3.

Total No. of Pages: 2 *Roll No. .....*

SIXTH SEMESTER **B.TECH (CSE)**

END TERM EXAMINATION ***(May 2018)***

CO306 COMPUTER NETWORKS

Time: 3 hours ***Max. Marks: 40***

Note: Attempt **any four** questions. Each question is of 10 marks.
Assume suitable missing data, if any.

1. a. Explain Selective Repeat Protocol with example. Consider a network connecting two systems located 8000 km apart. The bandwidth of the network is 500×10^6 bits per second. The propagation speed of the media is 4×10^6 meters per second. It is needed to design a Go-Back-N sliding window protocol for this network. The average packet size is 10^7 bits. The network is to be used to its full capacity. Assume that processing delays at nodes are negligible. What is the minimum size in bits of the sequence number field?

   b. Let the system wants to send 10 packets using Go back N protocol with sliding window size (N) as 3. What are the total no of transmissions if every 5^{th} packet is lost. **(10 marks)**

2. a. A user downloads the file of 4.5 MB from the website. The files routes through two routers R1 with maximum transmission unit (MTU) as 2.5 MB and router R2 with MTU as 1500 KB before finally reaching to the client. Show the fragmentation at each router and calculate the speed at which the file is downloaded by the client. Consider an instance of TCP's Additive Increase Multiplicative Decrease (AIMD) algorithm where the window size at the start of the slow start phase is 2 MSS and the threshold at the start of the first transmission is 8 MSS. Assume that a timeout occurs during the fifth transmission. Find the congestion window size at the end of the tenth transmission. (Assume 1 MB = 1000KB and IPv4 Header Length = 20KB).

P.T.O.

b. For a host machine that uses the token bucket algorithm for congestion control, the token bucket has a capacity of 1 megabyte and the maximum output rate is 20 megabytes per second. Tokens arrive at a rate to sustain output at a rate of 10 megabytes per second. The token bucket is currently full and the machine needs to send 12 megabytes of data. What is the minimum time required to transmit the data. **(10 marks)**

3. a. Explain IPv4 Classful IP addressing? The address of a class B host is to be split into subnets with a 6 - bit subnet number. What is the maximum number of subnets and maximum number of hosts in each subnet?
   b. What is count to infinity problem in DVR. Explain Link state algorithm with example. How is switch different from router? **(10 marks)**

4. a. Explain DHCP protocol? What is the difference between multicast and broadcast? Suppose there are n stations in a slotted LAN. Each station attempts to transmit with a probability 'p' in each time slot. What is the probability that only one station transmits in a given slot.

   b. The bank uses RSA algorithm at the presentation layer to encrypt the message M = 88 with its public key , e = 7. If the two prime no. used for encryption are p=17 and q=11, show the encrypted cipher and decrypted message at the receiver end. What is the remainder when $32^{32^{32}}$ is divided by 9? **(10 marks)**

5. Write short note on (any two) : **(5x2 =10 marks)**
   a. Channel Access Methods
   b. Mail Transfer Agent, SMTP, POP,IMAP
   c. Virtual Circuit Network
   d. ICMP

END

OLD

Total No. of Pages 01

Roll No. .....

SIXTH SEMESTER

B.Tech[CO/SE]

END SEMESTER EXAMINATION

MAY-2018

CO/SE-312: Compiler Design

Time: 3:00 Hours

Max. Marks: 70

Note :
Attempt any five questions .
All parts of a question must be attempted together.

Q.1 Construct CLR(1) parsing table for the following grammer : [14]

E→T / E-T
T→ F / *F
F →id / (E)

Q2. a) Describe analysis and synthesis phases of Complier? [7]

b) Design a DFA (with input alphabet {0,1}) that accepts [7]
i) The set of strings which either starts with 01 or end with 01.
ii) The set of strings containing four 1's in every string .

Q3.a i) Explain type of conflicts that occur in LR parsing with example? [7]
ii) Expain common prefix problem with example?
b) Explain recursive decent parser? [7]

Q4. a) Differentiate SDT and SDD by giving suitable examples? [7]

b) Write SDD for generating three address code for control flow statement. [7]

Q5. a) Explain the different data structures for symbol table implementation and compare them? [7]
b) Explain the static storage allocation strategy? [7]

Q6. a) Discuss the desirable features of error reporter? [7]
b) Explain error recovery strategies adopted by complier? [7]

Q7. a)Explain different representations of intermediate code? [7]
b) Explain the following optimizingtransformations with examples:
i) code motion ii) loop optimization [7]

-END-

Total No. of pages: 2 Roll No.:.....

B.Tech.(COE) (8TH SEMESTER)

END SEMESTER EXAMINATION MAY 2018

COE 412.2 : Advanced Database Management Systems

Time: 3 Hours Max. Marks:70

Note: Answer any FIVE questions.
Assume suitable missing data, if any

1) a) Explain the role of database in information system architecture. (7)

b) Explain the recovery system for distributed database (7)

2) a) What do you mean by subject oriented, integrated, time variant and non-volatile collection of data in data warehousing? (4)

b) What are data mart? How they are different from traditional data warehouses? (3)

c) Explain regression process in DWDM in detail (7)

3) a) Consider a distributed system with two sites, A and B. Can site A distinguish among the following?

- B goes down.
- The link between A and B goes down.
- B is extremely overloaded and response time is 100 times longer thannormal.

What implications does your answer have for recovery in distribute systems? (6)

b) Explain various kind of locking protocol used in distributed systems in detail. (8)

P.T.O

4) a) What is fragment of a relation? What are the main types of fragments? Why are fragments a useful concept in distributed database design? (7)

b) Explain the Distributed Query processing techniques in detail. (7)

5) a)What is multi-dimensional data model? Explain? (7)

b) Explain the architecture of multimedia database management system. (7)

6) a) What are the main software modules of DDBMS? Discuss the main functions of each of these modules in context to client-server architecture. (7)

b) Consider the following SQL query on the schema branch(branch_name, branch_city, assets):

selectt.branch_name

from branch t, branch s

wheret.assets>s.assets and s.branch_city = 'Burnaby';

Write an efficient relational algebra expression that is equivalent to this query and justify your choice with an explanation. (7)

7) Write short notes on any four following topics (4*3.5)

1) Content based retrieval
2) Web and semi structured data
3) Database Tuning
4) Advanced Data models
5) Peer to peer models
6) Scripting languages

-END-

Roll No.....

Total No. of Pages 1

B.Tech.(CO)
March– 2019

VI-SEMESTER
MID SEMESTER EXAMINATION

CO-302 Compiler Design

Time: 1:30 Hours

Max. Marks: 30

Note:Attempt all questions

Q.No. 1

A. Compute FIRST and FOLLOW sets and Construct a predictive parsing table for the following grammar,where S is the start symbol. [7]

S→iEtS | a
S→ iEtSeS
E→ b

B. Explain different phases of compiler with suitable example. [3]

Q.No. 2

A. Construct SLR(1) parsing table for the following grammar, where S is the start symbol [5]

S→BB
B→bB | a

B. What is the role of Push down automata (PDA) in syntax analysis? Eliminate Left recursion from following grammar [5]

S→aBDh
B→Bb | c
D→EF
E→g | ϵ
F→f | ϵ

Q.No. 3

A. Consider following grammar and test whether the grammar is LL(1) or not ? [5]

S→1AB| ϵ
A→ 1AC|0C
B→ 0S
C→ 1

B. Design a context free grammar(CFG) for the language L= $\{x^c y^c z^d u^d$ for c>=1,d>=1$\}$ [5]

Total No. of Pages: 2 *Roll No.....*

VI[TH] SEMESTER **B.Tech.(Computer Engineering)**

MID SEMESTER EXAMINATION **(March, 2019)**

CO304 **ARTIFICIAL INTELLIGENCE**

Paper Code

Time: 1:30 Hours **Max. Marks: 25**

Note: Answer all questions.
Assume suitable missing data, if any.

Q1. Answer to the point following:

(i) Describe the characteristics of the control strategy. Is breadth first search a control strategy? justify .

(ii) Compare and contrast Depth first search and Hill Climbing.

(iii) Define the term admissibility of a search procedure. Which search procedure is admissible?

(iv) Which problem solving approach used in Means End Analysis search procedure?

[4x2]

Q2. **(i)** Why best search is better than hill climbing

(ii) Work out few steps of A* algorithm for slide back puzzle having following moves.

I. A tile may move to adjacent cell with unit cost

II. A tile may hope another tile with a cost of 4

Initial and goal nodes are described as:

	1	3	2

1	2	3	

(iii) Design the procedure to revise cost upward of AO*algorithm and illustrate the steps using suitable search tree

[2,4,4]

Q3. For the graph in Fig (1), find the max value at the root node by applying mini max search. Also show alpha beta pruning.

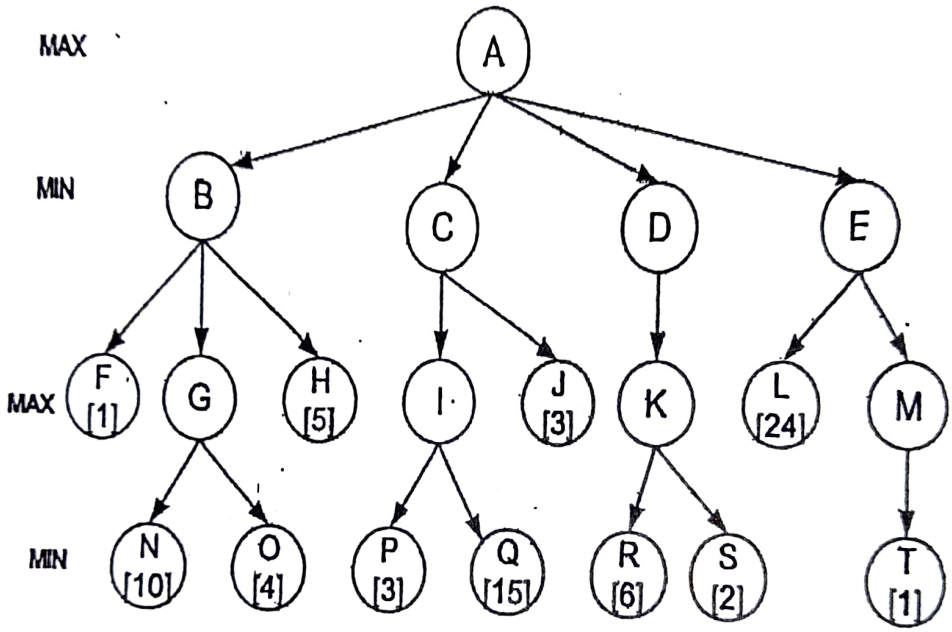
P. T. O.

[3]

Q4. (i) Represent the sentence in clause form: Any student who is intelligent or hard working gets a good placement

(ii) Given fact: A→ (B ^ C) and A, Use resolution procedure to prove that B is true.

[2,2]



Fig(1)

Total No. of Pages: 1 —119— Roll No.....

SIXTH SEMESTER B. Tech.(CO)

MID SEMESTER EXAMINATION MAR-2019

CO-306 COMPUTER NETWORKS

Time: 1:30 Hours Max. Marks: 30

Note: All questions are compulsory. Assume suitable missing data, if any. All questions carry equal marks.

Q.1 (a) Write the difference between bit stuffing and character stuffing.

(b)Sketch the waveform for the bit steam 10110010 in differential Manchester encoding scheme.

Q.2(a) Explain the IP header format of IPv4 in detail.

(b)How is CSMA a clear improvement over ALOHA? How is it further improved by implementing CSMA/CD?

Q.3 (a) A channel has a bit rate of 4kbps and propagation delay of 20ms.What is the minimum size of frame does stop and wait give efficiency of atleast 50% ?

(b) Categorize three basic topologies and give an advantage and disadvantage of each type.

Q.4(a)A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is $x^3 + 1$.Show the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission.

(b)Explain the distance vector routing algorithm and give the limitations of this algorithm.

Q.5Write short notes on any two of the following:

(a)IPv6

(b)HDLC

(c) PCM

(d) IEEE 802.5

Total No. of Pages 02 *Roll No.....*

Sixth SEMESTER **B.Tech. (CSE)**

MID SEMESTER EXAMINATION **March-2019**

CO318 ADVANCED DATABASE MANAGEMENT SYSTEM

Time: 1:30 Hours *Max. Marks: 30*

Note: Answer all Questions. Assume missing data if any.

Q1. (a) What is XML DTD? Explain the notations used in Document Type Definition (DTD). [3]

(b) Create a procedure that inserts multiple rows in an existing relation. [2]

Q2. Create a function that accept roll no from Student(roll_no, name,branch,year) relation as an input and returns his/her age. [5]

Q3. Draw all possible query tree for below Relational Algebra and what would be the best query plan? [5]

∏ EMP_ID, DEPT_NAME (σ DEPT_ID = 10 AND EMP_LAST_NAME = 'Sharma' (EMP) ∞DEPT)

Or

∏ EMP_ID, DEPT_NAME (σ DEPT_ID = 10 AND EMP_LAST_NAME = 'Sharma' (EMP ∞DEPT))

Or

σ DEPT_ID = 10 AND EMP_LAST_NAME = 'Sharma' (∏ EMP_ID, DEPT_NAME, DEPT_ID (EMP ∞DEPT))

Q4.(a) What is Materialized View (MV)? Explain it in connection with Join operation. [3]

(b) Explain Log based recovery with suitable example. [2]

P.T.O.

Q5. What is an equivalence rule? Describe various equivalence rules used for query optimization. [5]

Q6. Differentiate between the following: [5]

a) Embedded SQL and Dynamic SQL
b) Stored procedure and function

END

Total No. of Pages 1

SIXTH SEMESTER — 124 — **B.Tech.**

MID SEMESTER EXAMINATION ***(March-2019)***

CO326 OBJECT ORIENTED SOFTWARE ENGINEERING

Time: 1.5 Hours ***Max. Marks: 30***

Note: Answer ALL questions.
Assume suitable missing data, if any.

Q1. Answer the following:

a) Define the object "Employee" with possible attributes and operations.

b) Define object interaction.

c) What is meant by model?

d) Define Actor.

e) Explain UML. **[1X5=5]**

Q2. What is the significance of state chart diagram while designing the system? Explain the structure of state chart diagram of ATM Machine and illustrate the working. **[5]**

Q3. Differentiate between with suitable example:

a) Traditional software development life cycle (SDLC) with object oriented SDLC.

b) Sequence Diagram and Collaboration Diagram **[5X2=10]**

Q4. How can you judge the goodness of the object oriented design? Explain in brief about all the quality parameters. **[5]**

Q5. Differentiate between aggregation and generalization. State a problem of processing of order and generating invoices of sales in a medical store. Design a class diagram. Describe the role of each class, relationship between classes and operations defined. **[5]**

END

Total no. of Pages: 01
Mid Semester Exam
Eighth Semester

Roll no.....
Mar-2019
B.Tech.OEC

CO408 Intellectual Property Rights

Duration: 1.5 Hrs.

Max Marks: 25

NOTE: Attempt all the questions. Assume the missing data if any.

Q1.Answer the following questions in brief: (2x4=8)

1. What is trade mark act 1999?
2. What is patent information? Briefly explain the significance of using the patent information.
3. List the various kinds of IPR.
4. Differentiate between trademark and copyright.

Q2. An invention may satisfy the condition of novelty, inventiveness and usefulness but it may not qualify for a patent. Discuss. Who checks the novelty features of the invention? (3)

Q3.What is meant by Intellectual Property? Why does intellectual property need to be promoted and protected? (4)

Q4. Illustrate the Patenting process with the help of a flowchart. Explain the various steps involved. (5)

Q5. What are the various types of trademarks? Explain the process of e-filing of trademarks in detail. (5)

END

Roll No.....

Total No. of Pages:2

B.Tech.

VIIIth SEMESTER

MID SEMESTER EXAMINATION

March-2019

Paper Code: **CO414**

Title: BIG DATA ANALYTICS

Time: 1:30 Hours

Max. Marks:30

Note: 1. Attempt all the questions.
2. Assume any suitable value(s) for missing data.
3. Marks are indicated against each question.

1. Answer the following questions briefly: [5x1=5]
   (a) What are the three main characteristics of Big Data?
   (b) What are the three categories of Big Data?
   (c) Define the term "Moments"
   (d) What are the four main libraries in Hadoop?
   (e) Write down the main features of MapReduce?

2. (a) Explain the term "Intelligent Data Analysis". Describe various kinds of Data Analysis along with examples. [2.5]
   (b) Define the term "Resampling". What are the various techniques for resampling? [2.5]

3. Consider a random sample of size m = 25 from a normal population with known $a = 5.4$ and unknown mean μ. The observed sample mean is $x' = 128$.
   (a) Test the hypothesis H0: $\mu >= 130$, *against* $H0: \mu < 130$. [3]
   (b) Calculate the p-value of the observed outcome x' = 128. [2]

4. Suppose we have a stream of tuples with the schema :
   Grades (university, courseID, studentID, grade)
   Assume universities are unique, but a courseID is unique only within a university (i.e., different universities may have different courses with

P. T. O.

Total no. of pages: 02 Roll No.....

EIGHT SEMESTER **B. Tech. [CO]**

MID TERM EXAMINATION **March- 2019**

CO404 DATA WAREHOUSING & DATA MINING

Time: 01:30 Hours **Max. Marks: 30**

NOTE: Attempt any 4 questions.

Que 1. (a) Define Data Warehouse and describe key features of data warehouse.
(b) Define Data Marts. Compare and contrast Top-Down and Bottom-Up approach of Data Marts design. (3.5+4)

Que 2. (a) Compare and Contrast Type 2 and Type 3 slowly Changing dimensions. Justify with example.
(b) What is STAR Schema? You are the data design specialist on the data warehouse project team for a manufacturing company. Design a STAR schema to track the production quantities. Production quantities are normally analyzed along the business dimensions of product, time, parts used, production facility, and production run. State your assumptions. (3.5+4)

Que 3. (a) Explain any four of Dr. Codd's initial guidelines for OLAP. Give reasons why the selected for are significant for OLAP.
(b) What data does an information package contains? Explain Business metrics and Facts with five examples. Design IPD for problem stated in question 2(b). (3.5+4)

Ques 4. Suppose that the data for analysis includes the attribute age. The age values for the data tuples are (in increasing order) 13, 15, 16, 16, 19,20, 21,22, 22, 25, 25, 25, 25, 30, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70. What is the mean, median and mode of the data?

(b) Briefly describe nominal attributes, asymmetric binary attributes and Jaccard Coefficient with example. (3.5+4)

P.T.O.

Que 5. Consider the following transaction table:

Transaction ID	Items Bought
T001	{M, O, N, K, E, Y}
T002	{D, O, N, K, E, Y}
T003	{M, A, K ,E}
T004	{M, U, C, K, Y}
T005	{C, O, O, K, I ,E}

Write Apriori Algorithm. Compute all frequent itemsets, and find all strong association rules. Assuming min_sup=60% and min_conf=80%. (7.5)

END

Total No. of Pages 01

Roll No. ... ...

VI- SEMESTER
MID SEMESTER EXAMINATION

B.Tech [CO]
MARCH-2018

CO-302: Compiler Design

Time: 1:30 Hours ***Max. Marks: 30***

Note : 1) Attempt all questions.
2) All parts of a question must be attempted together.
3) Assume suitable missing data, if any.

Q.No. 1

a. Give an example of grammer to show that determinism cannot eliminate ambiguity ? (2)

b. Write a regular expression for real number and draw FA for that regular expression ? (3)

c. How a compiler differentiate between keywords and identifiers ? (3)

Q.No. 2

a. Rectify the problems with the following grammers to make them suitable for LL(1) parsing: (4)

i) S →Sa/Sb/AB/C/DEF
ii) A→da/acB ; B→abB/daA/Af

b. Design a PDA accepting language $L=\{a^n b^n \mid n \geq 0\}$ (4)

Q.No. 3

a. For the string id+id*id+id and the grammer (4)

E →E+T/T T→T*F/F F→id

Find i) leftmost derivation ii)rightmost derivation iii) parse tree

iv) Is the grammer ambiguous ?

b. For the grammer (10)

S→aBDh B→cC C→bC/Є D→EF
E→g/Є F→f/Є

Check whether the string "acbbgfh" is parsable by LL(1) parser or not
(Є is epsilon . Show all steps involved in parsing)

Total no. of pages: 1 Roll No.....

FOURTH SEMESTER **B. Tech.**

SUPPLEMENTARY EXAMINATION **August- 2018**

MG 202 FUNDAMENTALS OF MANAGEMENT

TIME: 3 Hours **Marks: 50**

Instructions: Attempt any 5 questions . All questions carry equal marks.

Q1. What is Capital Budgeting. Explain any 2 techniques of capital budgeting.

Q2. Discuss the concept of Corporate social Responsibility. Explain with the help of relevant examples.

Q3.What are the various functions performed by Marketing Manager. Also explain the ethical issues and concerns in Marketing.

Q4. in light of the concepts of explicit and tacit knowledge , explain the various sources of knowledge.

Q5. "Planning and controlling are linked with each other". Explain the various functions of Management in light of the same.

Q6. Write short notes on any 2 of the following

a. Maslow's need hierarchy theory
b. Line and Staff Organisation
c. PESTLE Analysis

END

Total no. of pages: 1 Roll No.....

FOURTH SEMESTER **B. Tech.**

SUPPLEMENTARY EXAMINATION **August- 2018**

MG 202 FUNDAMENTALS OF MANAGEMENT

TIME: 3 Hours **Marks: 50**

Instructions: Attempt any 5 questions . All questions carry equal marks.

Q1. What is Capital Budgeting. Explain any 2 techniques of capital budgeting.

Q2. Discuss the concept of Corporate social Responsibility. Explain with the help of relevant examples.

Q3.What are the various functions performed by Marketing Manager. Also explain the ethical issues and concerns in Marketing.

Q4. In light of the concepts of explicit and tacit knowledge , explain the various sources of knowledge.

Q5. "Planning and controlling are linked with each other". Explain the various functions of Management in light of the same.

Q6. Write short notes on any 2 of the following

a. Maslow's need hierarchy theory
b. Line and Staff Organisation
c. PESTLE Analysis

END