

Total No. of Printed Pages: 3

B.E. (Computer) Semester-VII (Revised Course 2019-20)
EXAMINATION JANUARY 2023
Compiler Design

[Time: Three Hours]

[Max. Marks:100]

- Instructions:**
- 1) Attempt Any Two Questions from PART-A and PART-B and One Question from PART-C
 - 2) Make Suitable Assumptions Whenever Necessary

PART-A

Q1 a) Consider the assembly program given below.

[10]

```
START 200
MOVER AREG, ='5'
MOVEM AREG, A
LOOP  MULT AREG, A
      MOVER CREG, B
      ADD CREG, ='1'
      BC ANY, AGAIN
      LTORG
          ='5'
          ='1'
AGAIN  SUB AREG, ='1'
      BC LT, BACK
LAST   STOP
      ORIGIN LOOP + 4
      MULT CREG, B
      ORIGIN LAST +1
A      DS      1
BACK  EQU     LOOP
B      DC      5
      END
          ='1'
```

- Design an assembler to generate machine language code for the above assembly program
 - Show the content of all the data structures generated during lexical analysis phase of assembler design.
- b) Describe the role of lexical analyser.
- c) Construct the DFA for the regular expression $RE = (a/b)^* abb$ [6]
[4]
- Q2 a) Check whether the following grammar is an LL (1) grammar. [8]
 $S \rightarrow iCtS \mid iCtSeS \mid a$
 $C \rightarrow b$
- b) Discuss the features of YACC tool.
- c) Define context free grammar for the following statements. [4]
[8]
- Nested for loop with atleast one if statement inside for loop.
 - Nested if statement with more than assignment statement inside if loop

- Q3 a) For the given LEX program, give the DFA implementation of the lexical analyser for the following [8]
regular definitions.

```
% {A, AB, ABB %}
%%
{a} {yylval = 1; return (A);}
{a*b+} {yylval = 2; return (AB);}
{a*b*} {yylval = 3; return (ABB);}
%%
```

- b) Explain with the help of pseudocode the use of the sentinel character in the input buffering. [6]
c) Write a short note on Front end and back end phases of compiler. [2]
d) Eliminate left Recursion from the following grammar. [4]
E->E+T T
T-> T FF
F-> (E) | id

PART-B

- Q4 a) Construct SLR parsing table for the following grammar [8]

```
S-> P
P->R|R
R-> (S) | id
```

- b) Explain the translation to produce three address code for assignment statements. [8]
c) Write a short on the errors that can occur in the front end phase of the compiler. [4]

- Q5 a) Explain the code generation algorithm with the help of an example. [7]
b) Write a short note on next use information. [3]
c) Consider the following statements.

```
sum = 0.0
for (i=0; i ≤ 10; i++)
{
    sum = sum +a[i];
    sum=sum + sum
}
```

- i. Construct the basic block for the above code. [4]
ii. Optimize each of the block using different optimization techniques. [6]

- Q6 a) What is Symbol table? Describe the contents of Symbol table. [6]
b) Write the algorithm to compute leading and trailing of a grammar. [5]
c) Write a short note on Backpatching. [5]
d) Draw DAG for the following [4]

```
t1 = a * a
t2 = a * b
t3 = 2 * t2
t4 = t1 + t3
t5 = b * b
t6=t4=t5
```

PART-C

- Q7 a) Compile the following set of C statements by showing the input and output of each phase of compilation. [8]
- ```
int x=0;
while (x <5)
{
 x = x+ 1;
}
```
- b) Write a short note on Evolution of Programming Languages. [4]
- c) Explain the role of parser with the help of a diagram in compiler construction. [4]
- d) Explain the features of Recursive Decent Parser. [4]
- Q8 a) Translate the following statement into Quadruples, Triples and Indirect Triple [8]
- $S = x[i] + y[i] * s$
- b) Consider the following grammar [8]
- $E \rightarrow E \text{ or } T \mid T$
- $T \rightarrow T \text{ and } F \mid F$
- $F \rightarrow \text{not } F \mid \text{true} \mid \text{false} \mid (F)$
- Construct operator precedence parsing table
- c) Explain the technique of peephole optimization with the help of an example. [4]

Total No. of Printed Pages:4

**B.E. (Computer) Sem VII (Revised Course 2016-17)**  
**EXAMINATION JANUARY 2023**  
**Data Mining**

**[Duration : Three Hours]****[Total Marks : 100]****Instructions:**

1. Assume suitable data
2. Answer any 02 questions from **PART- A** and **PART- B** and Attempt 01 question from **PART-C**

**PART A**

- Q.1
- a) What is the need for data pre-processing? List and explain various methods of data pre-processing in Data Mining (08)
  - b) Explain with neat diagram, Data Mining as a step in the process of knowledge discovery. (06)
  - c) The table given below describes rate of economic growth(X) and Rate of Return(Y) of Wipro Company. Use Co-Variance formula to determine whether economic growth and rate of return has a positive or negative relationship. Also Calculate Correlation Coefficient. (06)

|   |    |    |    |    |
|---|----|----|----|----|
| X | 30 | 20 | 20 | 10 |
| Y | 60 | 30 | 50 | 20 |

- Q.2
- a) Define Binning. Perform equi-width binning for the following sorted data (e.g. Price in Rupees): 5, 10, 11, 13, 15, 35, 50, 55, 72, 92, 204, 215 with three bins. Smooth by bin means, bin boundaries and bin median. (06)
  - b) What is a Data Warehouse? Explain various Schemas used for Multidimensional Data Model (08)
  - c) What is the difference between range and variance? (04)
  - d) Explain the curse of dimensionality? (02)
- Q.3
- a) Consider a Data Warehouse for the Chain of hotels where there are three dimensions: Seasons, Location, and Profit. Create a data cube and illustrate OLAP operations (assume necessary data). (06)
  - b) Explain the different types and characteristics of data sets used in data mining (08)

- c) For the given sales data: 300, 440, 700, 990, 1100 (06)
- i. Use Min – Max normalization to transform above values (Set min = 0 and max = 1)
  - ii. Use Z-score normalization to transform above values

**PART B**

- Q.4
- a) Explain how over fitting issue is handled in Decision tree induction (06)
  - b) With the help of an error graph explain the state of over fitting in decision trees. Explain the idea of pre-pruning and post-pruning and the related methods to fix the same (08)
  - c) Consider the following Proximity Matrix: (06)

|   |    |    |   |   |   |
|---|----|----|---|---|---|
|   | 1  | 2  | 3 | 4 | 5 |
| 1 | 0  |    |   |   |   |
| 2 | 9  | 0  |   |   |   |
| 3 | 3  | 7  | 0 |   |   |
| 4 | 6  | 5  | 9 | 0 |   |
| 5 | 11 | 10 | 2 | 8 | 0 |

Construct the dendrogram and draw the nested clusters using complete linkage clustering.

- Q.5
- a) Write the algorithm for basic k-means clustering. What are the advantages and disadvantages of k-means clustering? (08)
  - b) What are the key issues in hierarchical clustering? (05)
  - c) Using the k-means Clustering algorithm, divide the given dataset into two clusters. (07)

| ID | x   | y   |
|----|-----|-----|
| 1. | 1   | 1   |
| 2. | 1.5 | 2   |
| 3. | 3   | 4   |
| 4. | 5   | 7   |
| 5. | 3.5 | 5   |
| 6. | 4.5 | 5   |
| 7. | 3.5 | 4.5 |

- Q.6 a) Draw a decision tree for the following dataset: (08)

| Day | Weather | Temperature | Humidity | Wind   | Play? |
|-----|---------|-------------|----------|--------|-------|
| 1   | Sunny   | Hot         | High     | Weak   | No    |
| 2   | Cloudy  | Hot         | High     | Weak   | Yes   |
| 3   | Sunny   | Mild        | Normal   | Strong | Yes   |
| 4   | Cloudy  | Mild        | High     | Strong | Yes   |
| 5   | Rainy   | Mild        | High     | Strong | No    |
| 6   | Rainy   | Cool        | Normal   | Strong | No    |
| 7   | Rainy   | Mild        | High     | Weak   | Yes   |
| 8   | Sunny   | Hot         | High     | Strong | No    |
| 9   | Cloudy  | Hot         | Normal   | Weak   | Yes   |
| 10  | Rainy   | Mild        | High     | Strong | No    |

- b) Explain in brief direct and indirect methods in Rule based classifier. (08)
- c) Differentiate between Supervised and Unsupervised Learning (04)

**PART C**

- Q.7 a) Define Clustering. Use K-means Algorithm to cluster following 10 points into three clusters. (10)

| Transaction Id | Item Set            |
|----------------|---------------------|
| 1.             | f, a, c, d, g, m, p |
| 2.             | a, b, c, f, l, m, o |
| 3.             | b, f, h, o          |
| 4.             | b, k, c, p          |
| 5.             | a, f, c, l, p, m, n |

- b) Consider a Data Warehouse for the Company where there are three dimensions: Seasons, Location, and Items. Create a data cube and illustrate OLAP operations (assume necessary data). (06)
- c) Discuss whether or not each of the following activities is a data mining task. Justify (04)
- i) Monitoring the heart rate of a patient for abnormalities.
  - ii) Dividing the customers of a company according to their profitability

- Q.8 a) Construct the FP-Tree for the following dataset. (Consider the support count = 3) (06)

| Transaction Id | Item Set            |
|----------------|---------------------|
| 1.             | f, a, c, d, g, m, p |
| 2.             | a, b, c, f, l, m, o |
| 3.             | b, f, h, o          |
| 4.             | b, k, c, p          |
| 5.             | a, f, c, l, p, m, n |

- b) Consider the following transaction data set shown below: (08)

| Transaction | Items bought                |
|-------------|-----------------------------|
| T1          | Bread, Butter, Jam, Milk    |
| T2          | Bread, Butter               |
| T3          | Bread, Milk, Cheese         |
| T4          | Bread, Butter, Milk, Cheese |

Generate Association rules using Apriori algorithm. Consider values of support = 60% and Confidence =80%

- c) Given the two objects represented by attribute values: (06)  
 (1, 6, 2, 5, 3) and (3, 5, 2, 6, 7)
- Compute the Euclidean distance between two objects.
  - Compute the Manhattan distance between two objects.
  - Compute the Minkowski distance between two objects. using  $q=3$ .

Total No. of Printed Pages: 02

**B.E (Computer) Semester- VIII (Revised Course 2016-17)**  
**EXAMINATION JANUARY 2023**  
**Mobile Computing**

[Time: 3 Hours]

[Max. Marks:100]

- Instructions:**
1. Answer any 5 full questions by selecting two questions from Part-A, two questions from Part-B and one question from Part-C.
  2. Make suitable assumptions wherever necessary.
  3. Draw all relevant diagrams neatly.

**Part A**

Answer any TWO questions from the following:

- |    |                                                                                                         |   |
|----|---------------------------------------------------------------------------------------------------------|---|
| Q1 | a. Differentiate between wireless networking & mobile computing.                                        | 4 |
|    | b. Discuss the advantages & disadvantages of WLAN.                                                      | 6 |
|    | c. List & explain few Mobile Computing applications.                                                    | 4 |
|    | d. Explain why a specialized MAC is needed in Mobile Computing.                                         | 6 |
| Q2 | a. With the help of an example explain how CDMA works.                                                  | 8 |
|    | b. Explain the terms ubiquity & adaptation in mobile computing.                                         | 4 |
|    | c. How does Demand Assignment Multiple Access work? Why is it called as an explicit reservation scheme? | 8 |
| Q3 | a. What is slow start & fast retransmit/fast recovery?                                                  | 6 |
|    | b. Explain Agent Discovery in detail.                                                                   | 8 |
|    | c. With the help of a neat diagram explain IP packet delivery.                                          | 6 |

**Part B**

Answer any TWO questions from the following:

- |    |                                                                                                  |   |
|----|--------------------------------------------------------------------------------------------------|---|
| Q4 | a. Explain the working of Mobile Terminated & Mobile Originated Calls.                           | 8 |
|    | b. Write a note on security in GSM.                                                              | 6 |
|    | c. Draw and explain the signal flow during an inter-BSC, intra-MSC handover.                     | 6 |
| Q5 | a. Explain the UMTS network architecture. How are UMTS networks different from 2G networks?      | 8 |
|    | b. Explain the different GPRS services. What are the advantages and disadvantages of using GPRS? | 6 |
|    | c. Explain the working of the Ad Hoc On-Demand Distance Vector Routing protocol.                 | 6 |

- |    |                                                           |    |
|----|-----------------------------------------------------------|----|
| Q6 | a. Write a detailed note on VANETS.                       | 6  |
|    | b. Write detailed notes on:                               | 14 |
|    | i. Destination-Sequenced Distance-Vector Routing Protocol |    |
|    | ii. Dynamic Source Routing Protocol                       |    |

**Part C**

Answer any ONE question from the following:

- |    |                                                       |   |
|----|-------------------------------------------------------|---|
| Q7 | a. Explain the implicit reservation PRMA scheme.      | 6 |
|    | b. Draw & explain the functional architecture of GSM. | 6 |
|    | c. Explain TCP in single hop wireless network.        | 8 |
| Q8 | a. Explain in detail Localization & Calling in GSM.   | 6 |
|    | b. Explain the working of the Zone Routing protocol.  | 6 |
|    | c. What are the different security issues in MANETs?  | 8 |

Total No. of Printed Pages: 2

**B.E (Computer) Semester- VII (Revised Course 2016-17)**

**EXAMINATION JANUARY 2023**

**Elective - I - Web Technologies**

[Time: 3 Hours]

[Max. Marks:100]

- Instructions:** 1. Attempt five questions, any two questions each from Part -A and Part -B and one question from Part -C.  
2. Assume necessary data, wherever required.

**PART-A**

Answer any two questions from the following:

(2x20=40)

- Q1 a) Explain the OSI reference model. 7  
b) With the help of examples explain: 8  
I. External styles  
II. Internal styles  
c) Differentiate between XML and HTML. 5
- Q2 a) Differentiate between DTD and XML Schema. 7  
b) Create an HTML file which displays student ID, Name, Marks and percentage in a tabular format. 8  
c) Explain any two JavaScript objects. 5
- Q3 a) Create a XML document which stores resume of two students. It must have personal details, educational background and any other relevant data. 7  
b) Differentiate between GET and POST http methods. 8  
c) Discuss the alert and confirm pop up boxes in JavaScript with an example 5

**PART-B**

Answer any two questions from the following:

(2x20=40)

- Q4 a) With an example demonstrate the use of session object in JSP. 7  
b) Explain the following methods in PHP with examples: 8  
i. sqrt  
ii. max  
iii. strpos  
iv. strlen

- c) Write the SQL queries to perform the following operations in MySQL: 5  
 I. Insert  
 II. Update
- Q5 a) State any two advantages of MYSQL. Also explain any five data types supported by MYSQL. 7  
 b) Explain loops in PHP with examples. 8  
 c) How are arrays implemented in AngularJS? 5
- Q6 a) Explain the features of PHP. 7  
 b) Design a form in JSP which accepts three numbers from the user and displays the maximum number back to the user. 8  
 c) Write the PHP code to find the cube of a number. 5

### PART-C

Answer any one questions from the following:

(1x20=20)

- Q7 a) Explain different types of arrays in PHP. 7  
 b) Discuss event handling in JavaScript. 8  
 c) With an example explain the structure of an AngularJS program. 5
- Q8 a) Explain Cookies in PHP. 7  
 b) Write a note on AngularJS validators. 8  
 c) State the advantages and disadvantages of JSP. 5

Total No. of Printed Pages:2

**B.E. (Computer) Semester-VII (Revised Course 2019-20)**

**EXAMINATION JANUARY 2023**

**Mobile Computing & Android Programming**

**[Time: Three Hours]**

**[Max. Marks:100]**

**Instructions:** Attempt any two questions from PART-A, any two questions from PART-B and any one question from PART-C

**PART A**

- Q1 a) With the help of a neat diagram, explain functions of each layer in a simple network and reference model in a wireless and mobile environment. [8]  
 b) Distinguish between mobile computing and wireless networking. [6]  
 c) Define Signals. Briefly explain the different ways to represent the signals. [6]
- Q2 a) How can Multiple Access with Collision Avoidance (MACA) be used to solve hidden and exposed terminal problem? [6]  
 b) Compare SDMA, FDMA and TDMA with respect to terminals and signal separation. [6]  
 c) With a neat waveform, give the coding and spreading of the users A and B using CDMA. [8]  
 Data of A: 110  
 Key of A: 010100100010110011  
 Data of B: 001  
 Key of B: 000110101000010111
- Q3 a) W the help of a neat diagram describes the sequence of steps through which a packet is delivered to a mobile node using Mobile IP. [6]  
 b) Write short notes on the following: [8]  
 (i) Agent Advertisement (ii) Agent solicitation  
 c) Explain how snooping TCP acts as a transparent TCP extension. Give advantages and disadvantages of snooping TCP. [6]

**PART B**

- Q4 a) Explain GSM architecture in brief with diagram. [8]  
 b) With an example explain route discovery in DSR. [6]  
 c) Explain the states of Android Process in detail. [6]
- Q5 a) Explain the characteristics of MANETS. [6]  
 b) What are the different types of services offered by GSM? Explain in detail. [8]  
 c) What is intent? Explain the types of intents in android with example [6]
- Q6 a) List and explain the core Android libraries available to android developer. [8]  
 b) Write a short note on applications of MANETS. [6]  
 c) State and explain the key services used in Android framework. [6]

**PART C**

- Q7 a) Compare Indirect TCP and Mobile TCP. [7]  
 b) What limits the number of simultaneous users in a TDM/FDM system compared to a CDM system? What happens to the transmission quality of connections if the load gets higher in a cell? [5]

- c) Explain the working of Pure Aloha. How does Slotted Aloha increase the performance compared to Pure Aloha? [8]
- Q8 a) Describe IP-in-IP encapsulation with a diagram. [7]  
b) List and explain the attributes to be addressed for securing MANET's system. [5]  
c) Explain the following with respect to TCP: [4\*2=8]  
(i) Slow start (ii) Fast retransmit / fast recovery

Total No. of Printed Pages: 2

**B.E. (Computer) Semester-VII (Revised Course 2019-20)**

**EXAMINATION JANUARY 2023**

**Open Elective:- Data Analytics**

[Time: Three Hours]

[Max. Marks: 100]

**Instructions:**

- Answer any 2 questions from part A, 2 questions from part B and any 1 question from part C.
- Make suitable assumptions if required.

**PART A**

- Q1 a) Explain Supervised and Unsupervised Learning with the help of examples. 6 marks  
 b) What is Sampling? Enlist few sampling methods and explain. 6 marks  
 c) Briefly explain all the factors comprising Data Quality. 8 marks
- Q2 a) 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, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 36, 40, 45, 46, 52, 70. Find the mode and five-number summary for the given data. 6 marks  
 b) Briefly explain major tasks in Data Preprocessing. 8 marks  
 c) Explain the concept of Linear Regression. 6 marks
- Q3 a) With the help of mathematical expressions, explain Logistic Regression model. 8 marks  
 b) Briefly outline the major steps of decision tree classification. 6 marks  
 c) Why Naïve Bayesian classification called 'naïve'? Briefly explain the major ideas of naïve Bayesian classification. 6 marks

**PART B**

- Q4 a) With respect to DBMS, explain various data models. 6 marks  
 b) Explain in brief various phases of Data Analytics Lifecycle. 6 marks  
 c) Write a short note on applications of DBMS. 4 marks  
 d) Draw the block diagram of DBMS structure and explain. 4 marks
- Q5 a) Perform following operations/tasks on the data frame 'mf' given below and write the expected output after execution: 10 marks
- ```
> mf
```
- | | Length | Speed | Algae | NO3 | BOD |
|---|--------|-------|-------|------|-----|
| 1 | 20 | 12 | 40 | 2.25 | 200 |
| 2 | 21 | 14 | 45 | 2.15 | 180 |
| 3 | 22 | 12 | 45 | 1.75 | 135 |
| 4 | 23 | 16 | 80 | 1.95 | 120 |
| 5 | 21 | 20 | 75 | 1.95 | 110 |
| 6 | 20 | 21 | 65 | 2.75 | 120 |
1. Pick out the item from the third row and the third column
 2. Select the second row and display columns one to three.
 3. Display all the rows by leaving out the first value; select the third column alone.
 4. Display even rows and display all columns.
 5. Display odd rows and display all columns except 5th column.

Total No. of Printed Pages: 02

B.E - (Computer) (Sem-VII)(Revised Course 2019-2020)
EXAMINATION JANUARY 2023
Data Analytics

[Time: 3 Hours]

[Max. Marks:100]

- Instructions:** 1) Answer ANY 2 QUESTIONS from Part A & Part B & Any 1 from Part C.
2) Make suitable assumptions wherever needed.
3) Figures to the **right** indicate full marks.

PART A

- Q1 a) Explain: Profile of a Data Scientist. Also Provide set of skills they possess & Behavioral characteristics. 6
b) Explain K-means clustering algorithm with its mathematical formulation. Also provide a relevant example. 8
c) What is multiple linear regression? State how to use multiple linear regression with its relevant formula's 6
- Q2 a) Explain in Brief: Typical analytical architecture. 7
b) What does random refer to in Random forest? Explain its working. 7
c) What is Apriori principle? How many phases are in association rule Apriori algorithm. Explain. 6
- Q3 a) Explain K-medoids as a clustering algorithm. Is it better than K-means? 8
b) Write the ID3 Algorithm. Explain its steps and advantages. 6
c) Explain in Brief: Steps in text analysis process. 6

PART B

- Q4 a) Explain the R nuts and Bolts in Detail. 6
b) Explain in Brief the following Types of NoSQL Databases: i) Key-value Pair Based, ii) Column-oriented Graph, iii) Graphs based, iv) Document-oriented. 8
c) What is Data Analytics life cycle? State its different phases. 6
- Q5 a) What are the different Data types Supported in R. Explain them in Brief. 7
b) Can R be used for Data Visualizing? Explain the different ways to do so. 8
c) What are the Advantages of NOSQL Databases? 5

- Q6
- a) Name & Explain the following: i) Basic operations, ii) Basic statistics pertaining to R. 8
 - b) What are the different database languages? State the importance of each. 5
 - c) Differentiate between SQL & NoSQL. How to decide which is relevant for a project development. 7

PART C

- Q7
- a) Explain in Brief: Chi Square Test by providing the formula for the same. 6
 - b) State the different principal functions used to get the data into & out of R. 6
 - c) Explain the SVM Classification algorithm. State its properties, functions and types 8
- Q8
- a) Write a short note on T- Test. 6
 - b) Write a short note on Statistical hypothesis generation and testing. 7
 - c) What is re-sampling? State and explain the different re-sampling methods 7

Total No. of Printed Pages: 02

B.E. (Electronics & TC / Electronics & Comm Engg) Semester-VII (Revised Course 2019-20)**EXAMINATION JANUARY 2023****Consumer Electronics****[Time: Three Hours]****[Max. Marks:100]**

- Instructions:**
- 1) Answer any five questions, selecting two questions from Part-A, two questions from Part - B and one question from Part - C.
 - 2) Assume suitable data if necessary.
 - 3) Draw figures and sketches wherever necessary.

PART A

Answer any two questions (from Q.1, Q.2, and Q.3)

- | | | |
|----|--|---|
| Q1 | a) What are the characteristics of microphone? Explain in detail. | 6 |
| | b) With the help of neat sketch explain the principle of working of moving coil loudspeaker. | 8 |
| | c) What do you understand by baffle? Why it is needed? | 6 |
| Q2 | a) What are cross over circuits? Explain its working. | 5 |
| | b) With neat diagram differentiate between variable area method and variable density method in optical recording of sound. | 8 |
| | c) Explain the working of public address system with neat block diagram | 7 |
| Q3 | a) Explain briefly composite and component coding used in digital TV. | 7 |
| | b) Draw and explain the block diagram of digital TV transmitter | 7 |
| | c) Draw and explain the block diagram of cable TV system. | 6 |

PART B

Answer any two questions (from Q.4, Q.5, and Q.6)

- | | | |
|----|---|---|
| Q4 | a) With neat diagram explain working of Xerox machine. | 8 |
| | b) Explain the working of refrigerator in detail. Also draw the block diagram for the same. | 7 |
| | c) What are the precautions required to minimize shock hazards while handling electronic equipment's. | 5 |
| Q5 | a) With neat diagram explain how data is read from DVD disc. | 6 |
| | b) Explain the basic product development process. | 6 |
| | c) Write short note on <ol style="list-style-type: none"> i) Fax machine ii) Iron | 8 |
| Q6 | a) Discuss the internal and external factors influencing pricing. | 7 |
| | b) Explain the factors to be considered before installing a costing system. | 7 |
| | c) Explain the construction and advantages of solar panel. | 6 |

PART C

Answer any one questions (from Q.7. and Q.8)

- | | | |
|----|--|----|
| Q7 | a) Explain with neat diagram working of fluorescent lamps. | 7 |
| | b) Explain corporate level and functional level marketing objectives. | 6 |
| | c) With neat diagram explain TV wobuloscope. | 7 |
| Q8 | a) Explain the principle of magnetic recording and reproduction with neat diagram. | 5 |
| | b) Write short note on | 10 |
| | i) Graphic equalizer | |
| | ii) Tone Control. | |
| | c) Compare HDTV and conventional television system. | 5 |

Total No. of Printed Pages: 03

B.E. (Electronics & TC / Electronics & Comm Engg) Semester-VII (Revised Course 2019-20)

EXAMINATION JANUARY 2023

Hardware Description Language

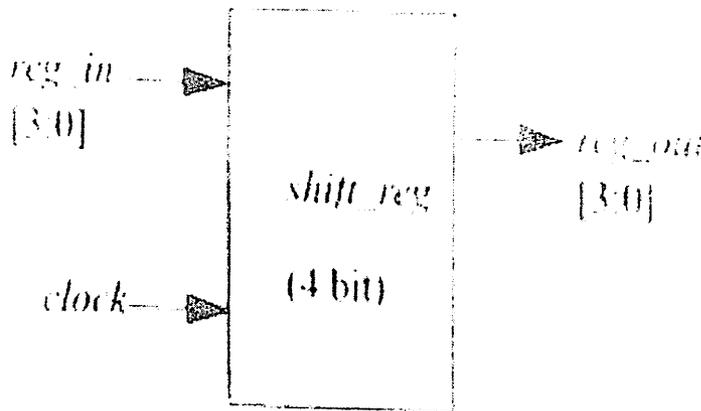
[Time: Three Hours]

[Max. Marks: 100]

- Instructions:**
- 1) Answer **any five** questions by selecting any two question from part-A, any two questions from part B & any one question from part C.
 - 2) Assume suitable data, if necessary.
 - 3) All symbols and abbreviations carry their usual meaning
 - 4) Figures to the right indicate marks.

PART A

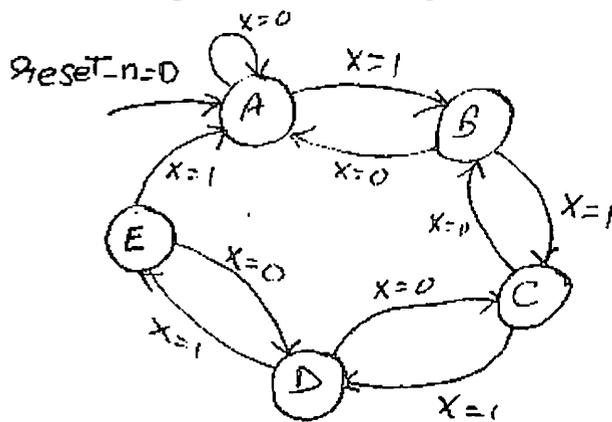
- Q1
- a) Describe the Design Flow using HDLS with neat diagram. 10
 - b) Design a 4-bit Shift register using D Flip Flop. Write a separate code for D-Flip Flop 10
- Q2
- a) Declare the following variables in Verilog 4
 - i) 8-bit vector net called a_in
 - ii) An array called delays. Array contains 20 elements of type integer
 - b) What is the output of the following statements 6
 - i). latch = 4'd12;
\$display("The current value of latch = %b\n", latch);
 - ii). in_reg = 3'd2;
\$monitor(\$time, "In register value = %b\n", in_reg[2:0]);
 - iii). `define MEM_SIZE 1024
\$display("The maximum memory size is %h", 'MEM_SIZE);
 - c) The I/O pins for the module shift_reg are shown in the fig. Write the module definition and the port declaration for the block 10



- Q3
- a) Write a verilog code for 1-bit Full adder. Using the Full adder module design a 4-bit ripple carry 15
adder.
 - b) What is implicit and explicit assignment delay. Explain with an example. 5

PART B

- Q4 a) `reg x, y, z;`
`reg [7:0] reg_a, reg_b;`
`integer count;`
`initial`
`begin`
`x = 0; y = 1; z = 1;`
`count = 0;`
`reg_a = 8'hff;`
`reg_b = 'd0;`
`reg a <= 8'h01;`
`reg_b[7:2] <= (x, y, z, reg_a[3:1]);`
`count <= count + 1;`
`end`
- For the above code what will be the values on the signals x, y, z, reg_a, reg_b and count after the simulation run
- b) What hardware module will get created for the following code: 6
`Always @reset, clock, d)`
`begin`
`if (reset)`
`q = 1'b0;`
`else if (clock) q = d;`
`end`
- Do you see any issues with the code? If so how will you correct it
- c) Write a Verilog Code for a one-digit BCD up-counter using behavioral modeling 8
- Q5 a) State the difference between tasks and functions 8
 b) Write Verilog code for 4:1 Multiplexer. Also write the testbench for the module 12
- Q6 a) What are the different data types in System C. Explain. 10
 b) Write a Verilog code for the following state machine. 10



OUT PUT Y	
State	value
A	2
B	4
C	7
D	9
E	15

PART C

- Q7 a) Write a Verilog code for a 256-byte dual port memory. Assume a data width of 32 bits per location 10
b) Write a Verilog Testbench for a D-Flip Flop 10
- Q8 a) reg c, d, e, f 10
always @(posedge clk1)
begin
b<= ~ b;
end

always @(posedge clk)
begin
a <= ~a;
end

always @(a or b)
begin
c=a+b;
d=c+a;
e <= a+b;
f=e+a;
end
For the above code draw a neat timing diagram for a run of 40 ns. Assume that initial value on all the signals is 0. Assume clk has period of 10ns period and clk1 has a period of 15 ns.
- b) Explain any four data types in Verilog. 5
c) Explain the difference between blocking and non-blocking statements 5

Total No. of Printed Pages: 02

B.E. - (Computer) (Sem-VII) (Revised Course 2019-2020)

EXAMINATION JANUARY 2024

OPEN ELECTIVE - Data Analytics

[Time: 3:00 Hours]

[Max. Marks: 100]

- Instructions:**
- Answer any 2 full questions from Part-A, 2 full questions from Part-B and any 1 full question from part C.
 - Make suitable assumptions if required.

PART A

- Q1 a) Differentiate between Supervised and Unsupervised Learning. [04]
 b) Enlist and explain major tasks in Data Pre-processing. [08]
 c) Explain K-means clustering algorithm with its mathematical formulation. Also provide a relevant example. [08]
- Q2 a) Define Big Data. Describe the characteristics of Big Data. [05]
 b) Find the value of Chi-Square for the following information: [04]

Class	A	B	C	D	E
Observed Frequency	8	29	44	12	5
Expected Frequency	23	5	34	21	9

- c) What is sampling? Enlist and explain few sampling methods. [07]
 d) Write a short note on BI versus Data Science. [04]
- Q3 a) The values of 'x' and the corresponding values of 'y' are shown in the table below: [10]

x	0	1	2	3	4
y	2	3	5	4	6

- i. Find the least square regression line $y = a x + b$
 ii. Use the least square regression line as a model to estimate the value of y when $x = 10$.
- b) With the help of a suitable illustration, explain Decision Tree Classifier. [06]
 c) Explain the following terms: [04]
 a) Mean b) Median c) Variance d) Standard deviation

PART B

- Q4 a) Explain the Model Planning and Model Building Phases of the Data Analytics Lifecycle. [07]
 b) Enlist and explain different data structures available in R. [06]
 c) Explain the different types of NoSQL databases. [07]
- Q5 a) Write short notes on: [06]
 i. Data Definition Language
 ii. Data Manipulation Language
 b) List and explain the different control statements used in R programming. [07]
 c) With a neat diagram explain the database system architecture [07]
- Q6 a) Provide an Illustration of getting data into & out of R. [06]
 b) Differentiate between data frame, matrix and a list. [04]
 c) Enlist and explain the Key roles for a successful analytics project. [06]
 d) Write a short note on applications of DBMS. [04]

PART C

- Q7 a) Why communication is important in data analytics lifecycle projects? [06]
 b) Compare and contrast Null Hypothesis and Alternative Hypothesis. [04]
 c) Explain Random Forest with an illustrative example. [06]
 d) Write a short note on Views in SQL. [04]
- Q8 a) Find the t-test value for the following two sets of data: [05]
 7, 2, 9, 8 and 1, 2, 3, 4.
 b) An oil company has explored three different areas for possible oil reserves. [07]
 The results of the test were as given below: (Critical Value:4.605)

	Area			Total
	A	B	C	
Strikes	7	10	8	25
Dry Holes	10	18	9	37
Total	17	28	17	62

Do the three areas have the same potential? Test with the help of Chi-square test at 10 per cent level of significance?

- c) Consider the following items for clustering: {3,5,11,13,4,21,32,12,28} Use the k-means algorithm to cluster the above data into three clusters [08]

Total No. of Printed Pages: 03

B.E. - (Computer) (Sem-VII) (Revised Course 2019-2020)
EXAMINATION DECEMBER 2023
Data Analytics

[Time: 3:00 Hours]

[Max. Marks: 100]

Instructions:

- 1) Assume suitable data if necessary.
- 2) Answer any two questions from Part A and Part B. Also attempt one question from Part C.
- 3) Draw neat diagrams if required.
- 4) Write question numbers legibly while answering.
- 5) Write description for the questions based on the marks allotted.
- 6) Use of statistical tables permitted if required.

Part A

- Q1
- A) What is the difference between Sampling and Re-sampling Methods. Discuss the features of Resampling methods. (05)
- B) Distinguish between supervised learning and unsupervised learning methods in data analytics. (05)
- C) Highlight the important characteristics of Big Data used in Analytics. (05)
- D) Explain the necessity of combining several algorithms for accomplishing a particular task. (05)
- Q2
- A) Explain briefly ANOVA Test. (06)
- B) Calculate the Chi-square value for the following data of incidences of water-borne diseases in three tropical regions. (08)

	India	Equador	South America	Total
Typhoid	31	14	45	90
Cholera	2	5	53	60
Diarrhoea	53	45	2	100
	86	64	100	250

C) On an examination given to the students at a large no of different schools, the (06) mean grade was 74.5 and standard deviation 8.0. At one particular school, where 200 students took examination, the mean grade was 75.9. Discuss the significance of the result at the 0.05 level from the view point of

- (i) One tailed test
- (ii) Two tailed test.

Q3 A) Given the dataset {a, b, c, d, e} and the following distance matrix given table 1, (10) construct a dendrogram by complete linkage hierarchical clustering using the agglomerative method.

	a	b	c	d	e
A	0	9	3	6	11
B	9	0	7	5	10
c	3	7	0	9	2
d	6	5	9	0	8
e	11	10	2	8	0

Table 1. Distance Matrix

B) Determine the regression equation by finding the regression slope coefficient and intercept value using the following data. (06)

X	55	60	65	70	75
Y	52	54	56	58	62

C) Explain the following.

- i) Boosting (04)
- ii) Bagging

Part B

Q4 A) What are Factors in R- Language? How are they created? How are they modified? Explain with R language code. (06)

B) Explain briefly different types database languages and their significance in DBMS. (06)

- C) Give the comparison of different types of NOSQL databases with reference to their performances. (08)
- Q5 A) Describe most commonly used data plots for statistical analysis in R Language. (06)
B) Explain Different phases of data analytic life cycle. (06)
C) Tabulate the features of SQL and NOSQL databases. (08)
- Q6 A) With reference to data frames in R language. (06)
i) Create a simple data frame from 3 vectors. Order the entire data frame by the first column.
ii) Create a data frame from a matrix of your choice, change the row names so every row says id_i (where i is the row number) and change the column names to variable_i (where i is the column number). i.e., for column 1 it will say variable_1, and for row 2 will say id_2 and so on.
B) Point out the functions which are used for the conversion of covariance to correlation in R. Explain the function with syntax and sample data. (06)
C) Summarize the operations that can be performed on a data frame in R language. (08)
- PART C**
- Q7 A) Explain with Step-by-Step procedure for the evaluation of machine language models in R language. (10)
B) State Bayes Theorem and illustrate with an example. How do we use numeric features in naïve Bayes algorithm? (10)
- Q8 A) What do you, mean by information gain and entropy? How is it used to build the decision trees? Illustrate with an example. (10)
B) Explain in detail about Aprori Algorithm. (10)

Total No. of Printed Pages: 02

B.E - (Computer) (Sem-VII)(Revised Course 2019-2020)
EXAMINATION DECEMBER 2023
Compiler Design

[Time: 3 Hours]

[Max. Marks:100]

- Instructions:**
1. Answer any 5 questions by selecting 2 questions from Part-A and 2 questions from Part-B and 1 question from Part-C
 2. Make suitable assumption only if required

Part-A

- Q1 a. With the help of a neat diagram explain the phases of compiler. 12
- b. Give the DFA implementation of the lexical analyser for the following LEX program: 08
- ```
%{
enum {A,AB,ABB}
}%
%%
a {return (B);}
abb {return (ABB);}
a*b+ {return (ABB);}
%%
```
- Q2 a. What is left-recursion? How is left-recursion eliminated? Eliminate left-recursion from the following grammar:  $S \rightarrow Aa|b$  08  
 $A \rightarrow Ac|Sd$
- b. What is CFG? Explain with an example. 04
- c. Compute the FIRST and FOLLOW for the following context Free Grammar: 08
- ```
S→ABCDE
A → a|ε
B → B|ε
C → c
D → d|ε
E → d|ε
```
- Q3 a. Explain the applications of compiler technology. 05
- b. Write a lex program to validate identifiers and floating-point numbers. 05
- c. Write a short note on YACC 05
- d. Write a short note on top-down parsers 05

Part-B

- Q4 a. Construct operator precedence parsing table for the following grammar and parse the string: (a,(a,a)) 08
- $S \rightarrow (L)|a$
 $L \rightarrow L, S|S$
- b. Construct SLR(1) parsing table for the following grammar: 08
- $S \rightarrow aSbS$
 $S \rightarrow a$
- c. Translate the following expression into quadruples and triples: 04
- $(x * y) * (p + q) + (x + y + z)$
- Q5 a. Explain the different issues in the design of code generator. 08
- b. Explain the code generation algorithm with an example. 08
- c. Write a short note on next use information. 04
- Q6 a. Identify the basic blocks and draw the flow graph for the following source code. 08
- total = 0.0
 for (i=1; i<n; i++)
 {
 total=total +x[i];
 }
- b. What is peephole optimization? Discuss four peephole optimization techniques with the help of example. 08
- c. What is Symbol table? Describe the contents of Symbol table. 04

Part C

- Q7 a. Explain the move to higher level languages. 05
- b. Explain the role of finite automata in lexical analysis 05
- c. Consider the following grammar: 05
- $E \rightarrow E + E|E - E|E * E|E/E|a|b$
 Obtain leftmost and rightmost derivation for the string $a+b*a+b$
- d. Explain recursive descent parser 05
- Q8 a. Explain the recovery techniques of lexical phase errors 05
- b. Write translation scheme to produce three-address code for Boolean expressions 05
- c. Explain the data structures used for symbol table 05
- d. Explain the DAG representation of basic blocks 05

Total No. of Printed Pages: 3

B.E. (Computer) Semester - VII (Revised Course 2016-17)

EXAMINATION DECEMBER 2023

Compiler Construction

[Time: 3:00 Hours]

[Max. Marks: 100]

- Instructions:**
- 1) Answer any two questions from PART A.
 - 2) Answer any two questions from PART B.
 - 3) Answer any one question from PART C.
 - 4) Make suitable assumption only if required.

PART – A

- Q1 (a) With the help of a neat diagram explain the phases of compiler. Illustrate each phase with input and output generated. (10 marks)
- (b) What is Context free Grammar? Context Free Grammar is called as Heart of compiler? Discuss. (6 marks)
- (c) What is the role of regular expression in compiler construction process? (4 marks)
- Q2 (a) Write a LEX specification program to identify various tokens such as Identifier, Floating point mobile number, and keyword. (8 marks)
- (b) Define Loader. Explain the bootstrapping and porting with help of example. (6 marks)
- (c) Define Finite Automata? Explain the significance of Finite Automata in Compiler construction. (6 marks)
- Q3 a) Construct the operator precedence table for the following grammar and parse the string:- $id+(id-id)+id$ (10 marks)
- $E \rightarrow E+E \mid E-E \mid E * E \mid (E) \mid - E \mid id$
- (4 marks)
- b) Explain left recursion and left factoring with help of example.

- c) Explain the recursive descent parser with help of example. What are the drawbacks of recursive descent parser? Discuss. (6 marks)

PART – B

- Q4 a) Explain various storage allocation strategies. What is significance of storage allocation to compiler construction? Discuss. (8 marks)
- b) Explain intermediate code generation or translation scheme for assignment and procedure call Statement. Generate intermediate code for the following input strings: i) total = a +b *c – b * c and ii) Compute(a,b,c,d) (12 marks)
- Q5 a) Consider the following grammar:- (8 marks)
- ```
S --> D V ;
D --> int | float | char
V --> id, V | id
```
- Detect the various errors with help of parsing table.
- b) What is the significance of symbol table? Explain the various data structure used for symbol table. (6 marks)
- c) Generate intermediate code for following statements: (6 marks)
- i) if (result < 30 && total < 20) { product = n1\*n2-n3; }
- ii) Net = h1\*u1+y1-r1\*t1
- Q6 a) Optimise the following code using basic block partitioning algorithm. (10 marks)
- ```
i=1;
j=1;
total=0;
for(i <10)
{
    while(j<20)
    {
        total= total + i* 10 +j;
        j=j+1;
    }
}
```

- b) Explain DAG with help of example. What is the significance of DAG in Compiler Construction? Discuss. (6 marks)
- c) Explain the Next Use Information in Compiler Construction. (4 marks)

PART C

- Q7 a) Write a Yacc program to valid the syntax of while loop statement with at least one assignment statements and simple expression inside while loop. (12 marks)
- b) Define Context free grammar for the following statements: (8 marks)
- i) Function call with N number of arguments and at least one argument should be simple expression.
 - ii) Switch statement with at least two for and one if statement inside switch case.
 - iii) Nested For loop and While loop with at least one assignment and one simple expression.
- Q8 a) Explain the steps of Simple Code Generator. Construct simple code generator for given statement: (8 marks)
- product = r+s*t+v-u*g+u
- b) What is code optimization? Explain peephole optimization techniques with help of example. (8 marks)
- c) Explain how to use register in optimal way in code generation phase? Discuss. (4 marks)

Total No. of Printed Pages:2

B.E - (Computer) (Sem-VII)(Revised Course 2019-2020)

EXAMINATION JUNE 2023

Mobile Computing & Android Programming

[Time: 3:00 Hours]

[Max. Marks:100]

- Instructions:**
1. Attempt any two questions from PART A and any two questions from PART-B and any one question from PART-C.
 2. Assume suitable data if necessary.
 3. Draw suitable diagrams wherever necessary.

PART-A

- Q1 a) What is Mobile computing? Explain the characteristics of Mobile Computing (6)
b) Explain the two major issues related to Wireless MAC Protocol. (8)
c) Compare CSMA/CA and CSMA/CD in wireless network. (6)
- Q2 a) With the help of neat diagram explain the Mobile IP packet delivery in detail (8)
b) What is signal? Briefly explain the 3 ways of representing signals. (6)
c) Compare FDMA & TDMA fixed assignment schemes. (6)
- Q3 a) With the help of neat diagrams, Explain the 3 key basic mechanism used in Mobile IP (8)
b) State the difference between Indirect TCP & Snooping TCP. (6)
c) Explain in detail how MACA protocol solves Hidden and Exposed terminal problem. (6)

PART-B

- Q4 a) Explain in detail services offered by GSM. (8)
b) Describe the characteristics of MANETS. (6)
c) Write a short note on Android Software Stack. (6)
- Q5 a) Briefly explain the below mentioned MANET routing protocol. (7)
i)DSR - Dynamic Source Routing
- b) Why is routing a complex task in MANETS? (3)
c) Explain the 5 states of Android Process in detail. (5)
d) What is intent? Explain the types of intents in android with example (5)
- Q6 a) With the help of neat diagram explain the GSM architecture in detail. (8)
b) Briefly describe some applications of MANETS. (8)
c) Explain the different Activity States involved in android application (4)

PART-C

- Q7 a) Explain the Desirable features required for Mobile IP (4)
- b) What is Pure ALOHA? How does slotted ALOHA technique overcomes the disadvantages of Pure ALOHA? (8)
- c) How is congestion controlled in Traditional TCP? Why Traditional TCP cannot be used for Wireless network? (8)
- Q8 a) State the purpose of home location register (HLR) and visitor location register (VLR) (4)
- b) Mention the security issues in MANETS (8)
- c) List some of the core Android libraries available to android developer. (4)
- d) State some of the key services used in Android framework. (4)

Total No. of Printed Pages: 02

B.E - (Computer) (Sem-VII)(Revised Course 2019-2020)
EXAMINATION JULY 2023
OPEN ELECTIVE Mobile Computing & Android Programming

[Time: 03:00 Hours]

[Max. Marks: 100]

Instructions: 1) Attempt any two questions from PART-A, any two questions from PART-B and any one question from PART-C

PART A

- Q1 a) What is Mobile computing? Explain the characteristics of Mobile Computing **06**
- b) Write a short note on Time Division Multiple Access. **06**
- c) With the help of a neat diagram describe the sequence of steps through which a packet is delivered to a mobile node using Mobile IP **08**
- Q2 a) There are 2 users A and B using CDMA approach. **06**
A's code: 01101001 B's code: 00111100
A's data: 1 B's data: 0
Assume both users' data is sent together and there is no noise.
(i) Show the codes are orthogonal
(ii) Compute the value received at the receiver.
(iii) At the receiver, reconstruct the data transmitted by A, B
- b) Write a short note on the following: **08**
(i) Pure Aloha (ii) Slotted Aloha
- c) Explain the desirable features of Mobile IP. **06**
- Q3 a) Compare mobile computing and wireless networking. **06**
- b) List and explain the characteristics of a good MAC protocol. **04**
- c) What is Signal? What are the different ways to represent a signal? **05**
- d) With help of a neat diagram, explain snooping TCP. **05**

PART B

- | | | |
|----|---|----|
| Q4 | a) List and explain the different services provided by GSM. | 06 |
| | b) Explain how is an ad hoc network set up without the infra structure support? | 06 |
| | c) List some of the core Android libraries available to android developer. | 08 |
| Q5 | a) List and explain the characteristics of Mobile Ad Hoc Networks (MANETS). | 05 |
| | b) Write a short note on applications of MANETS. | 05 |
| | c) Explain the different Activity States involved in android application. | 05 |
| | d) State some of the key services used in Android framework. | |
| Q6 | a) With the help of a neat diagram, explain GSM architecture. | 08 |
| | b) Explain Destination-Sequenced Distance Vector (DSDV) Routing protocol. | 07 |
| | c) What are the characteristics of ad hoc networks that cause vulnerabilities? Explain. | 05 |

PART C

- | | | |
|----|---|--------|
| Q7 | a) Explain a Real life mobile computing application pertaining to its specific characteristics. | 06 |
| | b) Describe IP-in-IP encapsulation with diagram. | 07 |
| | c) What are the major issues related to wireless MAC protocol? | 07 |
| Q8 | a) With the help of a neat diagram, explain functions of each layer in a simple network and model in a wireless and mobile environment. | 08 |
| | b) Explain the following with respect to TCP:
(i) Slow start (ii) Fast retransmit / fast recovery | 4*2=08 |
| | c) Compare SDMA and TDMA with respect to terminals and benefits. | 04 |

Total No. of Printed Pages: 1

B.E - (Computer) (Sem-VII)(Revised Course 2019-2020)**EXAMINATION JULY 2023****OPEN ELECTIVE Data Analytics****[Time:3 Hours]****[Max. Marks:100]**

- Instructions:** 1) Answer ANY 2 QUESTIONS from **Part A & Part B** & Any 1 from **Part C**.
 2) Make suitable assumptions wherever needed.
 3) Figures to the **right** indicate full marks.

PART - A

- Q1 a) Explain the Following Terms: a) Variance 2) Co Variance 3) Correlation Coefficient 05
 4) Mean 5) Median.
 b) Which are the 5 main skill sets & Behavioral characteristics for data scientist? 05
 c) What do you mean by Non Probability Sampling? Name & Explain any 4 Non 05
 Probability Sampling Methods.
 d) Explain bagging as Ensemble learning technique. 05
- Q2 a) Write a short note on Multiple Linear Regression? Provide Formula and Calculation 05
 of Multiple Linear Regressions.
 b) What are association rules explain with example. 07
 c) What is Logistic Regression? Provide Example and Use Cases. 08
- Q3 a) What is decision tree used for? State the different types of nodes used in decision 07
 trees? Also state a limitation of decision tree.
 b) What is Naïve Bayesian algorithm and how it works? 07
 c) Write a short note on Statistical hypothesis generation and testing. 06

PART-B

- Q4 a) Provide an Illustration for getting data into & out of R. 06
 b) Name & Explain the Key roles for a successful analytics project. 07
 c) Compare & Contrast between DDL & DML. 07
- Q5 a) Write a short note on Introduction to R by exploring the GUI illustration of R. 08
 b) Explain the different views of data in a DBMS. 04
 c) Name & Explain Common Tools for the Data Preparation Phase. 08
- Q6 a) How does statistics can be used for model building & evaluation in R 05
 b) Explain the Entity-Relationship Model, Provide an Illustrative example. 08
 c) Explain the different types of NoSQL databases. 07

PART - C

- Q7 a) Write a short note on T- Test. 08
 b) Describe the Data visualization using R. 07
 c) Who is a DBA? What are the functions of a DBA? 05
- Q8 a) Explain in Brief: Chi Square Test by providing the formula for the same. 06
 b) Why Stemming is need? Explain one Algorithm based on Stemming? 07
 c) Explain the two types of Hierarchical Clustering 07

Total No. of Printed Pages: 3

B.E - (Computer) (Sem-VII)(Revised Course 2019-2020)**EXAMINATION JUNE 2023****Compiler Design****[Time:3:00 Hours]****[Max. Marks:100]**

- Instructions:** 1. Make suitable assumptions if required. State your assumptions.
2. Attempt any two Questions from PART-A and PART-B and one question from PART-C.

Part A

- Q1 a) Explain the different phases of compiler construction and the components involved (10 marks) with a diagram and an example.
- b) What are lexical errors and syntactic errors? Explain the error recovery strategies (10 marks) for both types of errors.
- Q2 a) Compute the FIRST and FOLLOW sets of the following grammar. (5 marks)
 $S \rightarrow aAbB \mid aAaB$
 $A \rightarrow AS \mid a \mid b$
 $B \rightarrow BSa \mid a \mid c$
- b) Derive the DFA implementation of the Lexical Analyser for the following LEX (10 marks) program
- ```
%{
enum = {AB, B, BCC};
}%
%%
b {return (B); }
b+c+ {return (BCC); }
a*b- {return (AB); }
%%
```
- c) Discuss compiler writing tools. (5 marks)
- Q3 a) Explain error recovery in YACC. Write a YACC specification for a Desk Calculator with error recovery. (10 marks)
- b) Explain the process of bootstrapping and porting with the help of T-diagrams. (5 marks)
- c) Discuss the organizational issues of a two pass assembler with a neat diagram. (5 marks)

**Part B**

- Q4 a) Explain the issues in the design of a code generator. (6 marks)
- b) Construct the operator precedence parsing table for the grammar (8 marks)  
 $S \rightarrow (L) \mid a$   
 $L \rightarrow L, S \mid S$
- c) Convert the following statement into quadruple, triple and indirect triple representation. (6 marks)  
 $\text{Position} = \text{initial} + \text{rate} * A[i]$
- Q5 a) Explain the principal sources of optimization? (10 marks)
- b) What are the applications of dags? Construct a dag for: (10 marks)  
 $t1 = a + b$   
 $x = t1$   
 $t2 = a - b$   
 $y = t2$   
 $z = x + y$
- Q6 a) List and explain the data structures used to implement a symbol table. (5 marks)
- b) Why is it necessary to break the intermediate code into basic blocks? Translate the following code fragment to 3-address statements and draw the flow-graph. (10 marks)  
 $\text{count} = 0;$   
 $\text{for}(\text{int } i=0; i < 10; i++) \{$   
 $\quad \text{count} += 1;$   
 $\quad \text{max} = 100$   
 $\quad x[i] = \text{count};$   
 $\}$
- c) Write the syntax-directed translation scheme for the switch statement. (5 marks)

**Part C**

- Q7 a) Explain applications of compiler technology. (8 marks)
- b) Write the regular expression and draw the transition diagram for (4 marks)  
 i) Identifier in C  
 ii) White space in C
- c) Explain top-down parsing. (8 marks)



Total No. of Printed Pages: 02

**B.E - (Computer) (Sem-VII)(Revised Course 2019-2020)**  
**EXAMINATION JULY 2023**  
**OPEN ELECTIVE Mobile Computing & Android Programming**

[Time: 03:00 Hours]

[Max. Marks: 100]

**Instructions:** 1) Attempt any two questions from PART-A, any two questions from PART-B and any one question from PART-C

**PART A**

- Q1 a) What is Mobile computing? Explain the characteristics of Mobile Computing **06**
- b) Write a short note on Time Division Multiple Access. **06**
- c) With the help of a neat diagram describe the sequence of steps through which a packet is delivered to a mobile node using Mobile IP **08**
- Q2 a) There are 2 users A and B using CDMA approach. **06**  
A's code: 01101001      B's code: 00111100  
A's data: 1      B's data: 0  
Assume both users' data is sent together and there is no noise.  
(i) Show the codes are orthogonal  
(ii) Compute the value received at the receiver.  
(iii) At the receiver, reconstruct the data transmitted by A, B
- b) Write a short note on the following: **08**  
(i) Pure Aloha      (ii) Slotted Aloha
- c) Explain the desirable features of Mobile IP. **06**
- Q3 a) Compare mobile computing and wireless networking. **06**
- b) List and explain the characteristics of a good MAC protocol. **04**
- c) What is Signal? What are the different ways to represent a signal? **05**
- d) With help of a neat diagram, explain snooping TCP. **05**

**PART B**

- |    |                                                                                         |    |
|----|-----------------------------------------------------------------------------------------|----|
| Q4 | a) List and explain the different services provided by GSM.                             | 06 |
|    | b) Explain how is an ad hoc network set up without the infra structure support?         | 06 |
|    | c) List some of the core Android libraries available to android developer.              | 08 |
| Q5 | a) List and explain the characteristics of Mobile Ad Hoc Networks (MANETS).             | 05 |
|    | b) Write a short note on applications of MANETS.                                        | 05 |
|    | c) Explain the different Activity States involved in android application.               | 05 |
|    | d) State some of the key services used in Android framework.                            | 05 |
| Q6 | a) With the help of a neat diagram, explain GSM architecture.                           | 08 |
|    | b) Explain Destination-Sequenced Distance Vector (DSDV) Routing protocol.               | 07 |
|    | c) What are the characteristics of ad hoc networks that cause vulnerabilities? Explain. | 05 |

**PART C**

- |    |                                                                                                                                         |        |
|----|-----------------------------------------------------------------------------------------------------------------------------------------|--------|
| Q7 | a) Explain a Real life mobile computing application pertaining to its specific characteristics.                                         | 06     |
|    | b) Describe IP-in-IP encapsulation with diagram.                                                                                        | 07     |
|    | c) What are the major issues related to wireless MAC protocol?                                                                          | 07     |
| Q8 | a) With the help of a neat diagram, explain functions of each layer in a simple network and model in a wireless and mobile environment. | 08     |
|    | b) Explain the following with respect to TCP:<br>(i) Slow start (ii) Fast retransmit / fast recovery                                    | 4*2=08 |
|    | c) Compare SDMA and TDMA with respect to terminals and benefits.                                                                        | 04     |