(3 Hours)   Max. Marks**: 80**

N.B.: (1) Question No. **1** is **compulsory**.
(2) Attempt any **Three** questions out of remaining **Five** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume suitable data if **necessary**.

Qu-1	**Attempt the following.**	**20**
a)	Explain Simple Linear Regression.	
b)	Exploratory Data Analysis (EDA)? How Does Exploratory Data Analysis Differ from Summary Analysis?	
c)	Explain Data Visualization basics.	
d)	Explain Model-Based Clustering in short.	
Qu-2 a)	Explain data science process in detail with the help of diagram.	**10**
b)	One of the great strengths of R is the user's ability to add functions. In fact, many of the functions in R are actually functions of functions. Give the Syntax for writing Functions in R and write a User Defined Functions (UDF) to compute the Factorial of given number.	**10**
Qu-3 a)	Give a detailed description of K-Nearest Neighbor (KNN) Algorithm and state clearly i) When do we use KNN algorithm? ii) How do we choose the factor K?	**10**
b)	Explain Text analysis steps with a suitable text analysis example.	**10**
Qu-4 a)	Explain Logistic Regression in detail.	**10**
b)	Explain sentiment analysis with suitable example.	**10**
Qu-5 a)	Explain the Global Innovation Network and Analysis Case Study with following: i) Business Problem Framed ii) Initial Hypotheses iii) Data iv) Model Planning Analytic Technique v) Result and Key Findings	**20**
Qu-6	**Write short note on**	**20**
a)	Data science vs Bl	
b)	Support vector machine	
c)	Interactive dashboards	
d)	TF and TFIDF	

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(**3 Hours**)   [**Total Marks: 80**]

N.B. :   (1)   Question **No. 1** is compulsory.

(2)   Attempt any **three** questions out of remaining questions.

(3)   Assume suitable data if required.

1. (a)   Define UX .Why UX is important for Business   **5**
   (b)   Explain different Usability Principles?   **5**
   (c)   Explain mental models   **5**
   (d)   Compare different Prototyping approaches   **5**

2. (a)   Explain Contextual Inquiry process in detail   **10**
   (b)   Explain the template of a UX process lifecycle.   **10**

3. (a)   Define concept of Ideation in detail? State Difference between Idea
          Creation   and Critiquing.   **10**
   (b)   For Ticket Kiosk System design wireframe and create prototype.   **10**

4. (a)   Why to create "*persona*"? Explain the process of creating a persona

          for a design.   **10**

   (b)   Explain design-thinking paradigm.   **10**

5. (a)   Explain UX evaluation methods in detail   **10**
   (b)   Explain various UX design guidelines.   10

6. Write short notes on **(any two)**:-   **20**

          (a) User Action Framework and its Practical value
          (b) User requirement analysis for UXE project
          (c) Task Models.

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(3 Hours)   [Total Marks : 80]

Note:

(1) Questions No. **1** is compulsory.

(2) Solve any **three** questions from remaining **five** questions.

(3) Assume suitable data if necessary.

Q1.a)   In the Hospital there is main block and three wards in the campus. The main block is administrative block where registration of new patients takes place. The main block has 5 floors. The hospital has identified hospital management software, which should be accessible by the employees. The software is installed on a server at the administrative block. At the ground floor there are 15 computers at the billing section. At other floors, there is one computer user each. The farthest distance between the computer on the top most floor and the ground floor is less than70 meters .The wards have 5 floors each, with 10 computers in the ground floor of each wards. The distance between the wards and the blocks are less than 80 Meters. The computers in the wards may be increased based on future expansion plans.

     i) Hardware requirement analysis in the block with quantity

     ii) Hardware requirement analysis in wards

     iii) The employees should receive dynamic IP addressing from a central server.

     iv) Network should be loop free at Layer 2

     v) Every computer should be able to access the hospital management software from
        each of the location using a fixed IP address.

     vi) IP Network design table

     vii) Identify configurations on the hardware wherever appropriate.

     viii) Network Topology diagram with necessary equipment's.   [15]

b) What are the benefits of having hierarchy in addressing and routing models?   [5]

  Q2.   a) Describe security issues associated with RIPv2, OSPF, EIGRP, BGP? How these issues   [10]
      can be mitigated ?

     b) Explain about Cloud Reference Architecture framework? Write in brief about Data   [10]
      Center Topology, Data Center Tiers and Data Design with example?

  Q.3   a) Explain how SDN changed traditional Enterprise Network Design? Write in brief   [10]
      about PoX and NoX.

     b) What are the different types of architectural consideration that are take in Network   [10]
      Management. Discuss in detail any two considerations in detail?

  Q4.   a)   What is a Data Centers? What topologies are used for its design? Explain one   [10]
      topology in detail.

     b)   Explain the wireless network component architecture   [10]

  Q5.   a)   Explain how SDN changed traditional Enterprise Network Design? Highlight with
      example.   [10]

     b)   Describe the relevance of Narrow Band and Spread Spectrum WLAN technologies.   [10]

  Q6   a) What is Ethernet technology? How it's better than Token Ring, FDDI and ATM LAN   [10]
      Emulation (LANE).

     b) What are the most important criteria for selecting a WAN service provider.   [10]

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(3 Hours) [Total Marks: 80]

N.B. (1) Question No.**1** is **compulsory**, solve any **three** questions from **remaining** questions.
 (2) **All** questions carry **equal** marks.
 (3) Specify your answers with neat **diagrams** and **examples** wherever **necessary**.

Q1	**(a)**	Define Software and explain its characteristics	**05**
	(b)	Explain layered structure of Software Engineering	**05**
	(c)	What is QFD	**05**
	(d)	What are the limitations of LOC metric to measure size of the software	**05**

Q2	**(a)**	What is Cleanroom Software Engineering	**10**
	(b)	Explain different phases of Unified Process	**10**

Q3   For an Organization with employee strength of 5000 employees having 20 **20**
branches across world, Document Management system is to be developed. On an
average 20 thousand documents are uploaded every day by its employees. The
employee can upload the document, remove the document and online edit the
uploaded document. Using Machine Learning the uploaded documents is to be
categorized and stored in relevant folders on the servers. The system should
provide employee registration and login facility. The system should analyze the
uploaded document and notify the administrator regarding objectionable
contents. The administrator can remove the objectionable document. The warning
message to the employee who uploaded the objectionable document should be
send. The daily report of uploaded and deleted document is to be prepared. As per
requirement required documents can be downloaded from the system.

Draw Use Case, Activity Diagram, Class and Deployment Diagram for the given
scenario

Q4	**(a)**	Explain guidelines for good design. What are quality attributes?	**10**
	(b)	Explain design concepts	**10**

Q5	**(a)**	Explain different testing strategies	**10**
	(b)	Draw CFG for the PDL and find cyclomatic complexity	**10**

```
s1;
s2;
if(c1 or c2 and c3) s3; else s4;
s5;
do s6; while(c4);
s7;
```

Q6	**(a)**	Identify two risks for your ASE paper and prepare RMMM plan	**10**
	(b)	What is software reuse? How it affects productivity and quality of software	**10**

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