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20SCS21

Second Semester M.Tech. Degree Examination, July/August 2022
Data Science

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define Data Science. Explain the Venn diagram of Data Science. **(08 Marks)**

b. Explain the Data Science Profile. **(06 Marks)**

c. Explain the work of the Data Scientist in academia and industry. **(06 Marks)**

OR

2 a. What is Datafication? Explain with examples. **(06 Marks)**

b. Explain the following concepts with examples:
(i) Statistical inference
(ii) Population
(iii) Samples
(iv) Types of data **(10 Marks)**

c. Explain the Probability Distribution. **(04 Marks)**

Module-2

3 a. Explain Exploratory Data Analysis with example. **(10 Marks)**

b. Briefly explain Data Science Process with a neat diagram. **(10 Marks)**

OR

4 a. Explain the Linear Regression technique in brief. **(10 Marks)**

b. Explain K-Nearest Neighbors Algorithm. **(10 Marks)**

Module-3

5 a. Why Linear Regression and K-NN are poor choices for filtering spam? Discuss. **(10 Marks)**

b. Explain the Naïve Bayes Algorithm for Filtering Spam with example. **(10 Marks)**

OR

6 a. Describe scraping the web with API's and other tools. **(10 Marks)**

b. Explain Laplace Smoothing. **(05 Marks)**

c. Compare Naïve Bayes Algorithm with K-NN algorithm. **(05 Marks)**

Module-4

7 a. Explain and construct Decision Tree with an example. **(10 Marks)**

b. Write the short notes on:
(i) Feature selection criteria
(ii) Random Forest
(iii) The three Primary Methods of Regression
(iv) The Kaggle model **(10 Marks)**

OR

8 a. Explain Singular Value Decomposition. (05 Marks)
b. Describe the problems with the Nearest Neighbor in recommendation system. (05 Marks)
c. Explain Principal Component Analysis. (10 Marks)

Module-5

9 a. What is a Social Network? List and explain the characteristics of Social Network. (05 Marks)
b. Explain the Social Network Clustering Methods. (05 Marks)
c. Explain Girvan-Newman algorithm with example. (10 Marks)

OR

10 a. Explain the Neighborhood properties in graphs. (10 Marks)
b. Find the Normalized cuts for the following below graph. Fig.Q10. (05 Marks)
c. Find the Laplacian Matrix for the following below graph G, Fig.Q10. (05 Marks)

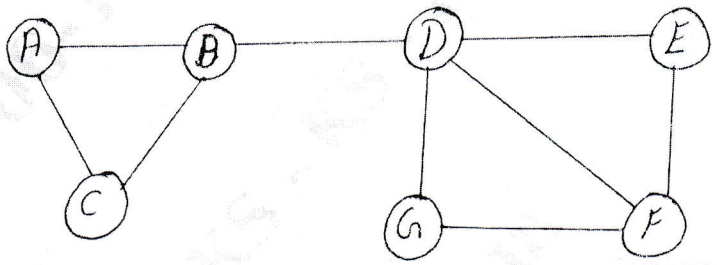

Fig.Q10

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20SCS22

Second Semester M.Tech. Degree Examination, July/August 2022
Semantic Web and Social Networks

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain intelligent web applications. **(10 Marks)**

b. Discuss about the World Wide Web. **(10 Marks)**

OR

2 a. Write a note on the information age. (10 Marks)

b. Describe semantic road map. (10 Marks)

Module-2

3 a. Explain how semantic web is used for knowledge representation. **(10 Marks)**

b. Explain the basic elements of RDF language. **(10 Marks)**

OR

4 a. Explain Resource description framework schema. (10 Marks)

b. Describe ontology web language. (10 Marks)

Module-3

5 a. Explain the process of constructing ontology. (10 Marks)

b. Discuss about methods, ontology sharing and merging. **(10 Marks)**

OR

6 a. Discuss about ontology engineering and ontology development tools. **(10 Marks)**

b. Give an overview of the following:
(i) Ontology logic rules (ii) Inference engines **(10 Marks)**

Module-4

7 a. Explain the XML based web services. (10 Marks)

b. What is the role of ontology in semantic web services? (10 Marks)

OR

8 a. Discuss about web search agents and semantic search technology. **(08 Marks)**

b. Explain OWL-S service profiles. Explain how OWL-S ontology is created for web services. **(12 Marks)**

Module-5

9 a. Explain how semantic web application is build with social network features. (10 Marks)

b. In detail explain web based networks. (10 Marks)

OR

10 a. What is a search engine? Explain about search engines. (10 Marks)

b. Write short notes on:
(i) Blogs and online communities (ii) Electronics discussion network **(10 Marks)**

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20SCS23

Second Semester M.Tech. Degree Examination, July/August 2022
Block Chain Technology

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the growth of block chain with network view block diagram. **(10 Marks)**
b. With a neat diagram, explain the generic elements of block chain. **(10 Marks)**

OR

2 a. Define block chain. Explain the different types of block chain. **(10 Marks)**
b. Explain the following: i) CAP Theorem ii) Zero-knowledge proof system. **(10 Marks)**

Module-2

3 a. Explain Byzantine models of fault tolerance. **(10 Marks)**
b. Explain various transactions for bitcoin. **(10 Marks)**

OR

4 a. Explain the following: i) Markley Tree ii) Consensus Mechanism. **(10 Marks)**
b. Describe Bitcoin with mathematical analysis of properties of Bitcoin. **(10 Marks)**

Module-3

5 a. Explain bitcoin scripting languages and their uses. **(10 Marks)**
b. Write a note on the following: i) GRAY Model ii) RLA Model. **(10 Marks)**

OR

6 a. Write a brief on Hybrid model of bitcoin. **(10 Marks)**
b. Write a short note on:
i) POW as random oracle
ii) Bitcoin limitations
iii) Privacy and Anonymity. **(10 Marks)**

Module-4

7 a. Explain the components of Ethereum eco system. **(10 Marks)**
b. Write a note on the following: i) Wallets ii) Smart contracts **(10 Marks)**

OR

8 a. Explain the Ethereum block chain structure. **(10 Marks)**
b. Explain the structure of Ethereum virtual machine. **(10 Marks)**

Module-5

9 a. What are the Myths vs reality of block chain technology. **(10 Marks)**
b. Explain the following: i) Cryptocurrency ii) Hyperledges fabric. **(10 Marks)**

OR

10 a. List out the limitations and applications of the block chain technology. **(10 Marks)**
b. Write a note on: i) E-Governance ii) Contract enforcement mechanism. **(10 Marks)**

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20SCS243

Second Semester M.Tech. Degree Examination, July/August 2022
Cloud Computing

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With a neat diagram, explain the structure of the three delivery models, SaaS, PaaS and IaaS. Analyze the differences between PaaS and IaaS. **(12 Marks)**

b. Explain with diagram, NIST cloud reference model. **(08 Marks)**

OR

2 a. Explain with diagram, various components of AWS. **(10 Marks)**

b. List and explain any two open source platforms for private cloud. **(10 Marks)**

Module-2

3 a. Bring out the similarities and some differences between workflows of traditional transaction-oriented systems and cloud work flows. **(10 Marks)**

b. Distinguish and narrate two basic models for the mechanics of work flow enactment. **(10 Marks)**

OR

4 a. Explain Zookeeper services and how the application programming interface (API) to the Zookeeper services make uses of seven operations. **(10 Marks)**

b. Write a note on:
i) Social computing
ii) Digital content
iii) Java message service. **(10 Marks)**

Module-3

5 a. Identify and narrate four means of virtualization simulation that interface to physical object. **(08 Marks)**

b. A common approach to managing system complexing is to identify a set of layers with well-defined interfaces among them. Explain in detail layering of virtualization with a diagram. **(12 Marks)**

OR

6 a. Explain with a neat diagram Xen network architecture considering the original architecture and the optimized architecture. **(10 Marks)**

b. Can virtualization empower the creators of malware to carry out their mischievas activities with impunity and with minimal danger of being detected? How difficult is to implement such a system? **(10 Marks)**

Module-4

7 a. Write short note on:
   i) Thresholds
   ii) Proportional thresholding in context of. **(10 Marks)**

   b. Explain in detail regarding "Pricing and Allocation Algorithms. **(10 Marks)**

OR

8 a. Discuss the Max-Min fairness criterion considering resource with band width 'B' shared among 'n' users who have equal rights. Each user requests an amount 'b_i' and receives "B_i" considering the above how many conditions must be satisfied by a fair allocation in Max-Min criterion. **(08 Marks)**

   b. Explain most common scheduling policies used to determine the order of execution. **(08 Marks)**

   c. Draw a Star-time Fair Queuing (SFQ) tree for scheduling when two Vimal machines VM_1 and VM_2 run on a powerful server. **(04 Marks)**

Module-5

9 a. What are the security risks faced by cloud users? Explain three broad classes of risk. **(12 Marks)**

   b. Considering three actors involved in the model the user, the service and cloud infrastructure. Explain six attacks with neat diagram. **(08 Marks)**

OR

10 a. A virtual machine running under Amazon's EC2 has several IP addresses. Explain the different IP addresses. **(10 Marks)**

   b. A distributed algorithm for trust management in cognitive radio computes the trust of node $1 \leq i \leq n$ in each node is its vicinity, $j \in v_i$ and requires several preliminary steps. Explain the basic steps executed by a node 'i' at time 't'. **(10 Marks)**

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20SCS252

Second Semester M.Tech. Degree Examination, July/August 2022
Object Oriented Design

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. List the important factors of an object. Justify the heuristic "All data should be hidden within its class", with an example. **(10 Marks)**

b. Define message and method. Explain the special messages to which classes/objects can respond. **(10 Marks)**

OR

2 a. Describe the God class problem (Behavioural form) in detail. **(10 Marks)**

b. What is an agent class? Illustrate the role of the agent class with an example. **(10 Marks)**

Module-2

3 a. Describe the different ways of implementing the uses relationship. **(10 Marks)**

b. Describe the vocabulary and semantics of the inheritance mechanism with an example. **(10 Marks)**

OR

4 a. Write the heuristics for the uses relationship. Justify the heuristic "Minimize the number of classes with which another class collaborates". **(10 Marks)**

b. With an example, describe the differences between public, protected and private inheritance. **(10 Marks)**

Module-3

5 a. What is Multiple Inheritances? Illustrate a valid use of multiple inheritances with a suitable example. **(10 Marks)**

b. Illustrate why the containment relationship would be chosen when give the choice in an object oriented. Design between a containment relationship and an association relationship. **(10 Marks)**

OR

6 a. Define class method and object method. Why the class variables should be used to perform book keeping information in the objects of a class? Justify. **(10 Marks)**

b. Describe the importance of persistence in object oriented system. **(05 Marks)**

c. Discuss the memory management issues in an object oriented applications. **(05 Marks)**

Module-4

7 a. Explain the principle of concurrent object oriented programming. **(05 Marks)**

b. Discuss the collection of reusable classes for users in a minimal public interfaces. **(05 Marks)**

c. Describe the broadcast pattern and interrupt pattern of object-oriented design. **(10 Marks)**

OR

8 a. Explain the generalization pattern and data hiding pattern of object-oriented design. **(10 Marks)**

b. With an example, discuss the lexical scope pattern and one-instance pattern of object-oriented design. **(10 Marks)**

Module-5

9 a. Summarize how object-oriented design can be implemented in non-object oriented languages. **(10 Marks)**

b. Explain the interrupt – polling pattern and specialization pattern of object-oriented design. **(10 Marks)**

OR

10 a. What are the requirement specifications of an ATM? Explain. **(10 Marks)**

b. Describe how the transaction processing takes place in an ATM system. **(10 Marks)**

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