

Total No. of Questions : 8]

SEAT No. :

PC1726

[6353]-43

[Total No. of Pages : 2

T.E. (Computer Engineering)
DATA SCIENCE AND BIG DATA ANALYTICS
(2019 Pattern) (Semester-II) (310251)

Time : 2 ½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
- 2) *Figures to the right indicate full marks*
- 3) *Neat Diagram must be drawn wherever necessary.*
- 4) *Assume suitable data if necessary.*

- Q1)** a) Draw data analytics life cycle diagram and briefly explain its phases. [6]
b) Explain the various key roles for a successful analytics project. [6]
c) What are various sources of Big data. [6]

OR

- Q2)** a) Describe few applications of Big Data Analytics. [6]
b) Explain Data preparation phase of data analytics lifecycle. [6]
c) List common tools used for model building phase of data analytic. [6]

- Q3)** a) Define and explain Entropy and Information gain. Calculate the entropy of the following distribution [9]

Fruit Color	Taste	Count
Yellow	Sweet	10
Red	Sweet	5
Green	sour	15
Orange	sour	5

- b) Explain Naïve Bayes Classifier. [8]

OR

P.T.O.



Study material provided by: Vishwajeet Londhe

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- Q4)** a) Explain Apriori algorithm with suitable example. [9]
b) Describe different categories of analytics [8]

- Q5)** a) What is Hierarchical clustering? Explain hierarchical clustering algorithms. [9]
b) Write a note on: [8]
i) Holdout method
ii) k-Fold Cross-Validation

OR

- Q6)** a) What is Text analysis? Explain the different steps involved in the text analysis. [9]
b) Write a note on Social network analysis. What are the applications of Social network analysis? [8]

- Q7)** a) Explain Hive architecture with suitable diagram. Describe characteristics and features of hive. [9]
b) Describe the data visualization tool Tableau. [9]

OR

- Q8)** a) What is data visualization and objectives of data visualization? Why it is difficult visualize Big Data? [9]
b) Write a note on Microsoft Power BI and Qlik [9]



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SEAT No. :

PC1727

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[6353]-44

T.E. (Computer Engg.)

WEB TECHNOLOGY

(2019 Pattern) (Semester - II) (310252)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q7 or Q8
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.

Q1) a) Explain Http Servlet class with example. Explain the servlet Life cycle method. **[10]**

b) Explain XML using DTDS & XML using XML Schema with example. **[8]**

OR

Q2) a) Explain servlet session management & tracking methods. **[9]**

b) Write note on :

i) AJAX **[5]**

ii) do Get Vs dopost **[4]**

Q3) a) Explain JavaBeans classes & JSP. **[8]**

b) Explain the concept of Web Services. Explain WSDL & SOAP. **[9]**

OR

Q4) a) Explain JSP Vs Servlets (Min.04). Explain how JSPS are translated to Servlets. **[8]**

b) Write note on struts. Explain struts with example code block. **[9]**

P.T.O.

Q5) a) Explain the MySQL & PHP for inserting the students data into the students table. (Assume suitable data) [8]

b) Write note on :

i) ASP. NET [5]

ii) NodeJS [5]

OR

Q6) a) Explain PHP functions and arrays in PHP. [10]

b) Explain the concept of NET framework and C# [8]

Q7) a) Explain the Ruby with respect to scalar types & their operations, control statements & arrays. [12]

b) Write note on EJB. [5]

OR

Q8) a) Explain the Rails Applications & databases. Also explain Rails with AJAX. [12]

b) Explain the advantages & Ruby & Rails. [5]



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SEAT No. :

PC-1728

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T.E. (Computer Engineering)
ARTIFICIAL INTELLIGENCE
(2019 Pattern) (Semester - II) (310253)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagram must be drawn whenever necessary
- 3) Assume suitable data, if necessary

- Q1)** a) Define Game Theory. What are the components, defining game as a Search Problem? Draw a Game Tree for tic-tac-toe. [9]
- b) What do you understand by Constraint Propagation? Write short notes on Node Consistency and Arc Consistency. [8]

OR

- Q2)** a) Explain how Minimax and alpha-beta algorithms change for two-players, non zero-sum games in which each player has his or her own utility function. [9]
- b) Define Constraint Satisfaction Problem. Explain Map Coloring Example Problem. . Formulate the Map Coloring Problem as CSP. [8]
- Q3)** a) Define Knowledge base and Sentence. Describe in detail about Wumpus World Environment along with brief description to find out the agent. Explain Task Environment. [8]
- b) Represent the followings into First Order Logic form: [10]
- i) All employees earning Rs.45000 or more pay tax.
 - ii) Sita is a marine engineer and she is also an artist.
 - iii) Children love icecream.
 - iv) If Humidity is high, temperature is high then a person cannot feel comfortable.
 - v) Puppies are cute.

If AB and AC are equal, then angle B and C are equal.

ABC is an equilateral triangle.

Represent these facts in predicate logic.

P.T.O.

OR

- Q4)** a) Write Short notes on followings: [9]
- i) Syntax and Semantics
 - ii) Proposition Logic Vs First Order Logic
 - iii) Knowledge Engineering Process in First Order Logic
- b) Show the following Sentences are valid or not. [9]
- a) $(P \wedge Q) \rightarrow (P \vee Q)$ b) $(\neg A \vee B) \wedge (\neg B \vee C) \rightarrow (\neg A \vee C)$
- Q5)** a) Prove that Universal Instantiation is sound and that Existential Instantiation produces an inferentially equivalent knowledge base. [8]
- b) Write Short notes on : [9]
- i) Forward Chaining
 - ii) Categories and Objects
 - iii) Back ward Chaining

OR

- Q6)** a) What do you understand by Resolution? Describe the Procedure to convert into CNF? Find the clause of the expression: $(\neg P \vee Q) \rightarrow R$ [9]
- b) What are the reasoning systems for Categories? Explain Semantic Network and Description Logic . [8]
- Q7)** a) Describe the differences and similarities between problem solving and planning. [5]
- b) Explain AI components and AI architecture [5]
- c) What are the different types of planning? How planning algorithm can be represented as state space search? [8]

OR

- Q8)** a) Explain What are Planning approaches? [6]
- b) Explain The Blocks World in detail. [6]
- c) What are the limitations of AI? Explain What are the Future Scopes with AI? [6]



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SEAT No. :

PC1729

[Total No. of Pages : 2

[6353]-46

T.E. (Computer Engineering)

INFORMATION SECURITY

(2019 Pattern) (Semester - II) (310254 A) (Elective - II)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*
- 2) *A Neat diagram must be drawn wherever necessary.*
- 3) *Assume suitable data if necessary.*
- 4) *Figures to the right indicate full marks.*

Q1) a) Differentiate between Asymmetric key cryptography and symmetric key cryptography? **[8]**

b) What are the different types of attacks possible on RSA? Explain in brief ? **[8]**

c) Discuss elliptic curve cryptography in detail? **[6]**

OR

Q2) a) Explain Diffie-Hellman key exchange algorithm? **[8]**

b) Perform encryption and decryption using RSA algorithm for the following : **[8]**

$P = 3; q = 11; d = 7; M = 5$

c) Explain El-Gemmal Algorithm in detail. **[6]**

Q3) a) What is a message authentication code? What is the difference between a message authentication code and a one-way hash function? **[8]**

b) Explain the steps to create the digital certificate with diagram? **[8]**

OR

Q4) a) What is Message Digest? Compare MD-5 with SHA-I? **[8]**

b) Explain the contents of X.509 format of certificate with diagram? **[8]**

P.T.O.

Q5) a) Write a short note on. [8]

- i) Honeypot
- ii) Distributed DOS attack

b) What are the capabilities and limitations of Firewall? [8]

OR

Q6) a) Explain following of Intrusion detection systems in detail? [8]

- i) Network based IDS
- ii) Host based IDS

b) Explain access control and its types in detail? [8]

Q7) a) Write short note on. [8]

- i) Cyber Terrorism
- ii) Social Engineering

b) Write short note on. [8]

- i) Keyloggers and spywares
- ii) Password Cracking

OR

Q8) a) Write short note on. [8]

- i) Phishing attack
- ii) Cyber Stalking.

b) Write short note on. [8]

- i) Indian IT act Information.
- ii) Security Life Cycle.



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SEAT No. :

PC1730

[Total No. of Pages : 2

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T.E. (Computer Engineering)

AUGMENTED & VIRTUAL REALITY

(2019 Pattern) (Semester - II) (310254 B) (Elective - II)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Solve Q1 or Q2, Q3 or Q4, Q5 or Q6 Q7 or Q8.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) a) Differentiate between aural and Haptic representation in Virtual reality?[6]

b) What is rendering system? [6]

c) How to render complex haptic scenes with force displays? [6]

OR

Q2) a) Describe visual representation in Virtual Reality? [6]

b) Explain geometric based rendering system in detail? [6]

c) Describe visual rendering methods. [6]

Q3) a) Explain the different properties of manipulation? [5]

b) What are the different ways to navigate in virtual world? [6]

c) What is collaborative interaction? [6]

OR

Q4) a) Explain how to interact with VR system. [5]

b) Explain the substance of the virtual world. [6]

c) What is Immersion? [6]

P.T.O.

Q5) a) Explain working of Augmented reality in detail. **[12]**

b) What is dimensionality? **[6]**

OR

Q6) a) Explain all hardware used in Augmented reality. **[12]**

b) What is registration and latency in AR? **[6]**

Q7) a) Explain software tools used for content creation in AR? **[12]**

b) What is Marker based tracking? **[5]**

OR

Q8) a) Explain Augmented reality used in mobile? **[12]**

b) What are different software components of AR? **[5]**



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SEAT No. :

PC1731

[Total No. of Pages : 2

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T.E (Computer Engg./Artificial Intelligence and Data Science Engg.)

CLOUD COMPUTING

(2019 Pattern) (Semester - II) (Elective-II) (310254(C))

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6 and Q7 or Q8.*
- 2) *Neat diagrams must be drawn whenever necessary.*
- 3) *Figures to the right indicates full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Define Virtualization? Describe different types of Virtualizations? [9]

b) Differentiate between Virtualization in Grid and Virtualization in Cloud?[8]

OR

Q2) a) Describe CPU, Network and Storage Virtualization? [9]

b) Draw and Explain the Virtualization Architecture in detail? [8]

Q3) a) Describe the Amazon Database Services? [9]

b) Explain Google Cloud Application in detail? [8]

OR

Q4) a) Identify the different components of Microsoft Azure? explain Briefly?[8]

b) How cloud computing can be used for business and consumer applications like ERP or CRM? [9]

Q5) a) What are the security issues of cloud computing identified by cloud security alliance (CSA)? explain any three in detail? [9]

b) How Trusted Cloud Computing can be used to manage the risk and security in a cloud? [9]

OR

Q6) a) Describe the six step risk management processes? [9]

b) Describe how to perform Secure Cloud Software Testing? [9]

P.T.O.

- Q7)** a) What do you mean by IoT Cloud? How IoT cloud can be used in home automation? [9]
b) Draw & Explain architecture of Kubernetes. [9]

OR

- Q8)** a) Identify the future trends in cloud computing? Explain in brief? [9]
b) Differentiate between Distributed Cloud Computing Vs Edge Computing? [9]



Total No. of Questions : 8]

SEAT No. :

PC1732

[Total No. of Pages : 2

[6353]-49

T.E (Computer Engg.)/(AI&DS)

SOFTWARE MODELING & ARCHITECTURE

(2019 Pattern) (Semester - II) (Elective-II) (310254(D))

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q.7 or Q.8.*
- 2) *Neat diagrams must be drawn whenever necessary.*
- 3) *Figures to the right indicates full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Draw State machine diagram for ATM system. [8]

b) Draw activity diagram for the library case study shown below. List all activities used in the diagram. [9]

Library Case study: Following is a process to issue a book:

Every book has a barcode sticker pasted on it. Every employee has Icard on which also barcode sticker is pasted. Employee has to select a book and has to approach librarian. Librarian scans the barcode of the book with barcode scanner. Then employee has to scan barcode on I card with barcode scanner. Librarian has to ensure book details, employee details and finalize the issue transaction of the book. Librarian tells return date to an employee.

Following is the process to return the book:

Employee has to carry the book to the librarian and librarian has to initiate the return transaction. Employee has to scan barcode sticker of I-card and book with barcode scanner. System calculates fine by using fine calculation rules. Librarian asks for fine amount to employee if any. Employees pay the fine. Librarian finalizes the return transaction. Note that, in above system, if barcode scanner does not work, librarian should be able to enter data using keyboard. There should be provision of providing rules of fine calculation. Even if employee doesn't have barcode sticker on I - card, librarian should be able to input employee id manually.

OR

P.T.O.

- Q2)** a) Explain the significance of timing diagram with a suitable example. [8]
b) Draw the sequence diagram (s) for the following case study. [9]

Online Course Reservation System:

The requirement form the customer is got and the requirements about the course registration are defined. The requirements are analyzed and defined so that it enables the student to efficiently select a course through registration system. Whenever the student comes to join the course he/she should be provided with the list of course available in the college. The system should maintain a list of professor who is teaching the course. At the end of the course the student must be provided with the certificate for the completion of the course.

- Q3)** a) What is an Architectural Patterns? Explain different types of Common software architecture structures. [8]
b) What is the software architecture? What are the three different views of an architecture? Explain the component of 4+1 architectural view model. [9]

OR

- Q4)** a) Explain the different Quality Attributes and Considerations required for in software development. [8]
b) Explain the importance of Object oriented software architecture and its applicability in software development? [9]

- Q5)** a) Explain Software Architecture Documentation and its Quality Attributes. [9]
b) Explain the real time software architecture with a suitable example. [9]

OR

- Q6)** a) Illustrate how Software Architecture used in Agile Projects with example. [9]
b) Explain synchronous communication pattern in Client server architecture with example. [9]

- Q7)** a) What is Behavioral Pattern? In which situation you use the Behavioral pattern? What is observer Behavioral pattern? Explain observer Behavioral in detail with the applicability of singleton creational pattern. [9]
b) Illustrate different approaches to select appropriate Design Patterns. [9]

OR

- Q8)** a) Draw the structure of observer pattern with suitable class diagram including subject and observer. [9]
b) Explain types of Structural Pattern in detail with examples. [9]