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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] JUNE 2025

Paper Code: FSD-322T **Subject: Web Development using MERN Stack**

Time: 3 Hours **Maximum Marks:75**

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

[5x5=25]

Q1 Attempt **any five** from the following:

a) Discuss the Role of CSS in Web Design.
b) Explain the Concept of Components in ReactJS.
c) Describe Node.js Event Handling.
d) Differentiate Between SQL and NoSQL Concepts.
e) What Are the Core Components of HTML?
f) Describe the Lifecycle of React Components.
g) Explain the Basics of Node.js and its Setup.

UNIT-I

Q2 a) Define client-side programming and its significance in web development. [4]

b) What are the basic syntax and key concepts of JavaScript? [4]

c) How does JavaScript interact with HTML to create dynamic web content? [4.5]

OR

Q3 a) Describe Express.js and its role within server-side development. [4]

b) What are middleware functions and how are they used in Express.js? [4]

c) Explain common functionalities like routing, handling requests, and managing cookies in the context of web applications. [4.5]

UNIT-II

Q4 a) What is Redux and how does it facilitate state management in React applications? [4]

b) What problem does Redux Saga solve? [4]

c) Discuss the benefits of using these tools for managing application state and handling asynchronous actions. [4.5]

OR

Q5 a) Why is unit testing important in React development? [4]

b) How does it ensure code quality and reliability? [4]

c) Explain the role of Webpack in bundling and optimizing React applications. How does Webpack enhance the development workflow in a React project? [4.5]

UNIT-III

Q6 a) What is Node.js and how does it differ from traditional server-side environments? [4]

b) How do you set up Node.js on your local machine? [4]

c) Describe the key features and benefits of using Node.js for backend development. [4.5]

OR

Q7 a) What is Express.js and why is it commonly used with Node.js for web development? [4]

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b) Describe the key features of Express.js, such as routing, middleware, and templating. [4.5]

c) How does Express.js simplify the process of handling HTTP requests and building RESTful APIs? [4]

UNIT-IV

Q8 a) Explain the fundamental differences between SQL and NoSQL databases. [4]

b) What are the key characteristics of each? [4]

c) How does the schema structure differ between these database types? [4.5]

OR

Q9 a) What are the strategies for migrating data into MongoDB from other databases or data sources? [6.25]

b) Discuss tools and methods for importing data into MongoDB efficiently while maintaining data integrity. [6.25]

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(Please write your Exam Roll No.) Exam Roll No. 663

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY-JUNE 2025

Paper Code: CIE-316 **Subject: Database Modelling & Design**

Time: 3 Hours **Maximum Marks:75**

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1 Attempt **any five** of the following questions: **[5x5=25]**

(a) Explain the design issue in ER and EER modelling

(b) Discuss the advantages and disadvantages of de-normalization in database design.

(c) Define integrity constraints and write the purpose of integrity constraint.

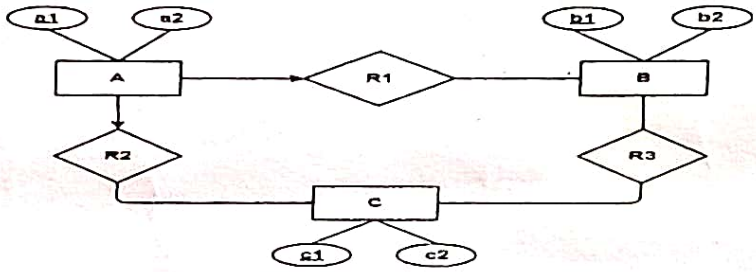
(d) Explain the triggers in database programming.

(e) What are primary keys and foreign keys? Explain their significance in database relationships.

(f) Explain the DCL Command with help of suitable example

(g) Explain the modelling complex relationship in database modelling system.

(h) Find the minimum number of tables required to represent the given ER diagram in the relational model-



UNIT-I

Q2 a) Illustrate the database system architecture with suitable diagram. **[6.5]**

b) Explain the components of database systems **[6]**

OR

Q3 a) Explain the database design life cycle with suitable diagram. **[6.5]**

b) Differentiate between conceptual, logical, and physical database design. **[6]**

UNIT-II

Q4 a) Describe the ER model and EER Mode. **[6.5]**

b) Illustrate briefly ER diagram with its logical schema for the College Management System. **[6]**

OR

Q5 a) Describe the Normalization and briefly explain its types with suitable examples. **[6.5]**

b) Explain the mapping of higher degree relationships. **[6]**

UNIT-III

Q6 a) Describe the physical database design and SQL commands with suitable example. **[6.5]**

b) Explain the advanced data manipulation using SQL. **[6]**

OR

Q7 a) Explain the cursor and type of cursor? [6.5]

b) Define the exceptional handling and the need of exceptional handling. [6]

UNIT-IV

Q8 a) Explain the clustering and its database cluster architecture suitable examples. [6.5]

b) Write short notes on [2x3=6]

i) Indexing

ii) Database Tuning

OR

Q9 Explain why database security is important? Describe the common threats and challenges in database security. [12.5]

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY-JUNE 2025

Paper Code: MS-302 **Subject: Principles of Management for Engineers**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions in all including Q.No1 which is compulsory. Select one question from each unit.

Q1. Attempt all questions: (2.5x10=25)

a) Discuss the importance of management in present day world.
b) How does symbolic view of management differ from omnipotent view.
c) Discuss the ethical implications of management decisions on stakeholders.
d) Differentiate between policies and strategies.
e) Analyze the role of the Managerial Grid in developing leadership capabilities.
f) "Delegation of authority is not loss of power, it is enhancement of power." Examine this statement clearly.
g) Define the term planning and its importance.
h) Compare mechanistic and organic organizational structures.
i) Compare and contrast different types of control in organizational settings.
j) Distinguish between authority and power within an organizational context.

UNIT I

Q2. (a) Management as a Science and Art and Profession. Explain (6)

(b) Explain the functions of managers at different levels of organization. What are the key management skills needed at different levels of organizational hierarchy? (6.5)

Q3. (a) Explain how political, legal, economic and cultural environments influence global business operation. (6.5)

(b) Explain the concept of social responsibility in management. What are the arguments for and against this. (6)

UNIT II

Q4. (a) Explain the steps involved in Decision making process. Discuss the characteristics of Decision making process in management. (6)

(b) A construction firm, XYZ Builders, is planning a high-rise apartment project. The project must be completed in 24 months, but due to delays in materialsupply and labour shortages, the firm is falling behind schedule. The project manager, Mr. Arvind, needs to plan how to complete the project on time, manage budget overruns due to inflation and handle workforce inefficiencies and improve productivity. (6.5)

Answer the following questions:

1. What are the different types of planning Mr. Arvind can use?
2. How can he implement contingency planning to deal with unexpected delays?
3. What strategies can help to optimize resource allocation in such a project?

Q5. (a) Discuss the Contingency Theories of Leadership and the Path-Goal Theory in detail. (6)

(b) Examine the evolution of leadership theories and their implications for modern leadership practices. (6.5)

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UNIT III

Q6. (a) "Sound organization structure is essential prerequisite of efficient management". Discuss this statement and point out various principles which should be followed in developing organization structure. Elucidate the essential stages in the process of organization. **(4.5)**

(b) Define the term departmentation. Explain different types of departmentation in detail. **(5)**

(c) Differentiate between delegation of authority and decentralisation of authority. **(3)**

Q7. (a) State the difference between recruitment and selection. Discuss the different sources of recruitment process. **(4)**

(b) Explain the steps involved in the selection process and its importance. **(4.5)**

(c) Discuss the importance of human resource inventory in organizational management. With the help of an example explain how an organization can effectively utilize HRI to support strategic decision making and planning. **(4)**

UNIT IV

Q8. (a) Define the concept of controlling in management. Discuss the requirements and process for effective control within an organization. **(6.5)**

(b) Discuss the concept of budget as a control technique. State the advantages and limitation of this technique. **(6)**

Q9. Write short note on the following: **(12.5)**

a) Impact of Information Technology on the efficiency of control systems.

b) Discuss the use of various types of tools used to monitor and measure organisational performance.

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY 2025

Paper Code: DA-304T

Subject: Statistics, Statistical Modeling & Data Analytics

Time: 3 Hours

Maximum Marks: 75

Note: Attempt five questions in all including question no. 1 which is compulsory. Select one question from each unit.

Q1 Attempt **all** questions (5x5=25)

a) Let X be a random variable having binomial distribution B (7, p). If P(X=3) =5P(X=4), then calculate p, mean and the variance of X

b) Compute the sum-of-squares error for the given set of data (0, -1), (1, 3), (4, 6), (5, 0); and linear model y=x+2.

c) State the Gauss-Markov theorem and what are the assumptions of the Gauss-Markov theorem?

d) Compute the Manhattan and Euclidean distances between points A (1,2,3) and B (4,6,8)

e) Given the matrix $\begin{bmatrix} 3 & -1 \\ 4 & 2 \end{bmatrix}$, find its characteristic equation and eigenvalues.

UNIT-I

Q2 a) The ages of employees in a company are given in the following table: (7)

Age (Years)	20-25	25-30	30-35	35-40	40-45	45-50
No. of Employees	5	8	15	10	7	5

Calculate the mean income and standard deviation of the above data.

b) Suppose a book of 585 pages contains 43 typographical errors. If these errors arerandomly distributed throughout the book, what is the probability that 10 pages, selected at random, will be free from errors? (5.5)

Q3 a) The average score on a test is 80 with a standard deviation of 10. With a new teaching curriculum introduced it is believed that this score will change. On random testing, the score of 38 students, the mean was found to be 88. With a 0.05 significance level, is there any evidence to support this claim? (7)

b) A random variable X has the following probability distribution:

x	0	1	2	3	4	5	6	7	8
P(x)	k	3k	5k	7k	9k	11k	13k	15k	17k

i) Determine the value of k

ii) Find P(X<4), P(X≥5), and P(0<X<4) (5.5)

UNIT –II

Q4 a) Three different teaching methods A, B, and C were used to teach students. The exam scores of randomly selected students from each method are:

A	B	C
78	88	75
82	91	80
85	84	78
90	79	85
87	92	82

(The table value of F at a 5% level of significance for v_1=2 and v_2=12 is 3.89). **(10)**

b) X is a normal variate with mean 30 and standard deviation of 5. Find the probability that (X≥45). **(2.5)**

a) List the assumption of a simple linear regression Model. State the point through which the regression line always passes. **(5.5)**

b) Fit a straight line to the following data by the method of least squares **(7)**

X	1	2	3	4	5
Y	2	3	5	6	8

UNIT-III

a) Define a metric space and state its properties. **(4)**

b) Is the function $d(x,y) = |x^2 - y^2|$ a metric on $\mathbb{R}$. **(4)**

c) Consider the sequence$a_{n=\frac{n}{n+1}}$. Show that $\{a_n\}$ is a Cauchy Sequence. **(4.5)**

a) What is meant by open and closed set? Can a set be both open and closed? **(4)**

b) Is every convergent sequence in a metric space a Cauchy sequence? Justify your answer **(4.5)**

c) Explain Compactness and Connectedness. **(4)**

UNIT-IV

a) What is a vector space? How a vector space is different from metric space? **(4)**

b) Find the Eigen values and Eigen vector for the matrix **(8.5)**

$$A = \begin{bmatrix} 5 & -10 & -5 \\ 2 & 14 & 2 \\ -4 & -8 & 6 \end{bmatrix}$$

a) For the matrix $A = \begin{bmatrix} 5 & -10 & -5 \\ 2 & 14 & 2 \\ -4 & -8 & 6 \end{bmatrix}$

i) Find the inverse of matrix A using Cayley-Hamilton Theorem.

ii) Use the Cayley-Hamilton Theorem to verify that A satisfies its own characteristic equation. **(8.5)**

b) Determine whether the given set of vectors in R^n is linearly dependent or linearly independent:

$v_1 = (1,2,3)$, $v_2 = (1,0,1)$, $v_3 = (1,-1,5)$ **(4)**

(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] JUNE 2024

Paper Code: MS-302 ***Subject: Principles of Management for Engineers***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No1 which is compulsory. Select one question from each unit.

Q1 Attempt all questions: **(2.5x10=25)**

a) Discuss the challenges for management in the new millennium.
b) Briefly explain different function of management.
c) What is the Importance of Planning?
d) Differentiate between policies and strategies
e) Explain Tools for measuring organizational Performance.
f) Define Qualities of successful leaders
g) Explain basic concepts of organization
h) Explain one benefit of delegation of authority for employee development and empowerment.
i) Briefly explain the concept of "work-life balance" and its significance in contemporary workplaces.
j) Explain how leaders are different from managers.

UNIT-I

Q2 a) What are the three levels of management? Briefly explain their functions **(6)**

b) Ashutosh Goenka was working in 'Axe Ltd.', a company manufacturing air purifiers. He found that the profits has started declining from the last six months. Profit has an implication for the survival of the firm, so he analyzed the business environment to find out the reasons for this decline.

1. Identify the level of management at which Ashutosh Goenka was working.
2. State three other functions being performed by Ashutosh Goenka. **(6.5)**

Q3 a) Explain Management as a Science and Art and Profession **(6)**

b) Sujata works as a designer in an export house. As per the terms of an order received by the export house, she has to get 1000 units of denim jackets made in 15 days @ Rs.2000 per jacket. She is able to complete her target production in 20 days because in order to complete the order in 15 days she would have made the workers work over time. As a result, the cost of production per jacket may have increased by Rs.100. In the context of the above case, is Sujata efficient in her work? Explain by giving a suitable reason in support of your answer. **(6.5)**

UNIT-II

Q4 a) What are the challenges organizations may face in the planning process, and how can they be overcome? **(6)**

b) Discuss how leadership theories have been evolved over time and the implications for contemporary leadership practices. **(6.5)**

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] JUNE 2024

Paper Code:CIE-356T **Subject- Web Technologies**

Time: 3hours **Max. Marks: 75**

Note : Attempt five questions including Q. No. 1 which is compulsory. Select one Question from each Unit. Assume suitable missing data if any.

Q1 Answer the following: **(5x5=25)**

a) What is Javascript ?
b) What is XML?
c) What is an event in javascript?
d) How can you set background images in HTML?
e) What are the form elements in HTML?

UNIT-I

Q2 a) How many types of list in HTML and Explain with HTML Code. **(6.5)**

b) What are the XHTML and DHTML? **(6)**

Q3 a) Write a program- **(6.5)**
i) To add a button on a form.
ii) To add an order list in page.

b) Write a program, to create a frame using Percentage(%). **(6)**

UNIT-II

Q4 a) What is CSS and why it is so useful rather than simple HTML and Explain with suitable examples. **(6.5)**

b) How to convert HTML into XHTML. **(6)**

Q5 a) Define Cookies and what is a cookie servlet. **(6.5)**

b) What is HTML and what types of pages are created with the help of HTML. How are these pages different? **(6)**

UNIT-III

Q6 a) Explain the concept of session define session tracking and session hijacking. **(6.5)**

b) Explain the difference between servlet and applets. **(6)**

Q7 a) What is JDBC and DTD? **(6.5)**

b) What are the types of JSP directives? **(6)**

UNIT-IV

Q8 a) Explain JSP in detail. **(6.5)**

b) Explain variables in PHP. **(6)**

Q9 a) Write a program in PHP using Array. **(6.5)**

b) Explain the exception handling in PHP **(6)**

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] JUNE 2024

Paper Code: ETCS-312/310 **Subject: Artificial Intelligence**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 a) Write short note on applications of AI. **(5)**

b) Write names of various informed and uninformed search strategies. **(5)**

c) How is unification used in resolution? **(5)**

d) Discuss expert systems in detail. **(5)**

e) Explain computational learning theory in detail. **(5)**

UNIT-I

Q2 a) Explain Missionary-Cannibal problem in detail. **(6.5)**

b) Discuss 8 puzzle problem using A* search algorithm. **(6)**

Q3 Explain constraint satisfaction problem. Solve crypt-arithmetic Puzzles given below: **(12.5)**

i)
```
  SEND
+ MORE
 MONEY
```

ii)
```
  SOME
+TIME
 SPENT
```

UNIT-II

Q4 a) Discuss FOPL in detail. **(6)**

b) Compare forward chaining with backward chaining. **(6.5)**

Q5 a) Represent the following facts as predicates. **(8)**

i) Marcus was man.
ii) Marcus was a Pompeian
iii) All Pompeian were Roman
iv) Caesar was ruler
v) All romans were either loyal to Caesar or hated him.
vi) Everyone is loyal to someone.
vii) People only try to assassinate Caesar.

b) Was Marcus loyal to Caesar? If yes, construct the proof by backward chaining. **(4.5)**

UNIT-III

Q6 a) Write short note on Explanation based learning. **(6.5)**

b) Explain min-max search algorithm and discuss alpha beta cut-off briefly. **(6)**

Q7 a) Explain different methods of theorem proving. **(6)**

b) Explain different tasks that must be performed for Natural Language Understanding. **(6.5)**

UNIT-IV

Q8 Explain different types of learning with examples. **(12.5)**

Q9 Write short notes on:

a) Robotics **(6)**

b) K means clustering **(6.5)**

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] JUNE 2024

Paper Code: FSD -322T **Subjects: Web Development using MERN Stack**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions including Q. No 1 which is Compulsory. Select one question from each unit.

Q1 Attempt all the questions. **[3x5=15]**

(a) Explain the three-tier architecture of Mern Stack with diagram.
(b) Differentiate between: Shadow Dom and Virtual Dom.
(c) Describe the building blocks of React?
(d) What is meant by "Callback" and "Callback Hell" in Node JS?
(e) How to explain closures in JavaScript and when to use it?

UNIT –I

Q2 (a) In How many ways an HTML element can be accessed in Java Script code? What is the 'this' keyword in JavaScript? **[5]**

(b) Discuss the different CSS link states? Can elements be overlapped in CSS. Justify this. **[5]**

(c) Differentiate between: **[2x2.5=5]**
(i) Block elements and inline elements
(ii) tag and <i> tag

Q3 (a) How to handle JavaScript Events in HTML? Explain with example. **[7]**

(b) Write short notes on (any **two**): **[2x4=8]**
(i) Call Method( ) and Apply Method( )
(ii) CSS Box Model
(iii) Document Trees

UNIT –II

Q4 (a) Explain the components in React JS. Write the differences between class and functional components with example? **[8]**

(b) Define React Hooks. Demonstrate the useState hook and useEffect hook in react? **[7]**

Q5 (a) Explain State and Props in React JS. Give an example to update the state of component. **[7]**

(b) Describe in brief (any **two**): **[2x4=8]**
(i) React Router
(ii) Redux
(iii) Unit Testing

UNIT –III

Q6 (a) Explain the significance of Node.js in backend development. How Node.js differs from traditional server-side technologies. **[5]**

(b) Illustrate the process of handling HTTP requests and responses using Express.js. **[5]**

(c) Explain the Node.js event loop mechanism. How does it help in handling asynchronous operations efficiently? **[5]**

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Q7 (a) Discuss the concept of middleware in Express.js. Give two examples of middleware functions and write their purposes. **[7]**

(b) Give brief description on following: **[2x4=8]**
(i) Streams in Node JS
ii) Express.js Scaffolding

UNIT -IV

Q8 (a) Write the features of MongoDB. How does MongoDB differ from traditional relational databases? **[7]**

(b) Perform with code (any **two**): **[2x4=8]**
(i) Add data in MongoDB?
(ii) Delete a Document?
(iii) Update a Document?

Q9. (a) Describe the process of sharding in MongoDB. How does MongoDB ensure high availability? **[7]**

(b) Explain with code (any **two**): **[2x4=8]**
(i) Document in MongoDB
(ii) Collection in MongoDB
(iii) Databases in MongoDB

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] JUNE 2024

Paper Code: DA-304T ***Subject: Statistics, Statistical Modelling & Data Analytics***

Time: 3 Hours **Maximum Marks:75**

Note: Attempt five questions in all including Q.No. 1 which is compulsory. Select one question from each unit.

Q1 Attempt All **[3x5=15]**

a) State Gauss-Markov theorem in detail.

b) Define open set and closed set. Also give examples.

c) State Cayley- Hamilton theorem and why it is useful.

d) A variate X has the probability distribution

X	-3	6	9
P(X=x)	1/6	½	1/3

Find E(X) and $E(X^2)$. Hence evaluate Var(X).

e) Two bolts are drawn from a box containing 6 good and 8 defective bolts. Find the probability that the second bolt is good if the first one is found to be defective.

UNIT-I

Q2 a) A manufacturer knows that the condensers he makes, contain on an average 1% defective. He packs them in boxes of 100. What is the probability that a box selected at random will contain 3 or more defective condensers? **(5)**

b) Calculate the mean and standard deviation for the following: **(5)**

Size of item	6	7	8	9	10	11	12
Frequency	3	6	9	13	8	5	4

c) A sample of 100 iron bars is said to be drawn from a large number of bars whose lengths are normally distributed with mean 4 feet and S.D. 0.6 feet? If the sample mean is 4.2 feet, can the sample be regarded as a truly random sample? **(5)**

Q3 a) Define chi-square test as goodness of fit. A random number table of 250 digits showed the following distribution of digits 0,1,2,3,4,5,6,7,8,9.

Digit	0	1	2	3	4	5	6	7	8	9
Observed Frequency	17	31	29	18	14	20	35	30	20	36
Expected Frequency	25	25	25	25	25	25	25	25	25	25

Does the observed distribution differ significantly from expected distribution using a significance level of 0.01? Given that $\chi^2_{0.99}$ for a degree of freedom is 21.7. **(7.5)**

b) X is a normal variate with mean 30 and standard deviation is 5. Find the probability that: i) $26 \le X \le 40$ ii) $X \ge 45$ iii) $|X-30|>5$.
(Given that $P(0 \le z \le 1) = 0.3413$, $P(0 \le z \le 2) = 0.4772$, $P(0 \le z \le 0.8) = 0.2881$, $P(0 \le z \le 3) = 0.4986$). **(7.5)**

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END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] JUNE 2024

Paper Code: CIE-306T / FSD-318T **Subject: Advanced Java Programming**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five question in all including Q.No1 which is compulsory. Select one question from each unit.

Q1 All Question are compulsory

(a) Differentiate between core java and advanced java. **(5)**

(b) State and explain the types of cookies in servlets. **(5)**

(c) List out and explain the features of JSP. **(5)**

(d) How JSP is more advantageous than Servlet. **(5)**

(e) Explain Hibernate framework and how it is related to ORM tool. **(5)**

UNIT-I

Q2 (a) Write a java program to demonstrate the concept of socket programming. **(6.5)**

(b) Discuss the advantages, disadvantages and hierarchy of applets. **(6)**

Q3 (a) Explain the basic steps of implementing a server with basic methods used in each step. **(6.5)**

(b) Write a program in java to demonstrate the concept of applets. **(6)**

UNIT-II

Q4 (a) Explain the lifecycle of a servlet with an example. **(6.5)**

(b) Write a java program to demonstrate the use of Java Beans. **(6)**

Q5 Discuss the types of Java Beans with a diagram of each type. **(12.5)**

UNIT-III

Q6 Explain the lifecycle of a JSP page with a diagram. **(12.5)**

Q7 Illustrate about any five implicit objects of JSP with example. **(12.5)**

UNIT-IV

Q8 Discuss the steps to write a RMI program with an example of each step. **(12.5)**

Q9 Draw the architecture diagram of Hibernate framework and also explain its elements. **(12.5)**

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