



**Faculty of Engineering and Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th Semester/2015

Date of Test: 20th September 2018

Course Code: CSC402A

Course Title: Web Architecture and Application Development

15ETCS002027

Term Test - 1

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Any missing data may be assumed appropriately and the justification stated clearly

Maximum Duration: 1 Hour

Maximum Marks: 25

Question No. 1:

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write the most appropriate choice as your answer in the answer booklet. (Each sub question carries half a mark)

- 1.1 Process control architecture is best suited for _____.
- Java applications
 - Real time embedded applications
 - Reservation systems
 - Database applications
- 1.2 The transmission of e-mail is performed through _____.
- POP
 - SMTP
 - HTTP
 - FTP
- 1.3 The basic components of the object oriented conceptual model are _____.
- Invariant relationships
 - Algorithms and flowcharts
 - Logic expressions in predicate calculus
 - Classes and objects
- 1.4 IMAP servers provide support for _____.
- Telnet
 - Internet
 - Multiple remote mailboxes
 - File server
- 1.5 Object-oriented programming offers the benefit of _____.
- Concurrency
 - Interactivity
 - Polymorphism
 - Exchangeability
- 1.6 One of the runtime quality attributes of software is _____.
- Lifetime
 - Testability
 - Scalability
 - Availability
- 1.7 HTML page does not contain _____ tag.
- <table>
 - <head>
 - <first>
 - <title>
- 1.8 HTTP request does not contain _____ method.
- HEAD
 - ADD
 - POST
 - GET

- 1.9 Pipes and filters software architecture style provides the benefit of _____.
- a. Concurrency
 - b. Simple division
 - c. Stand-alone application
 - d. Sequential process

- 1.10 Batch sequential software architecture style does not support _____.
- a. Concurrency
 - b. Interactivity
 - c. Incremental development
 - d. Exchangeability

Question No 2

(2+3=5 Marks)

- a. Describe software connectors and any of its two classifications.
- b. Convert the following XML document to DTD:

```
<?xml version="1.0"?>
<professordb>
    <prof>
        < profid>1</profid>
        <name >Kiran</name >
        < dep >Electronics</dep >
    </ prof >
    < prof >
        < profid>2</ profid>
        <name >Ashok</name >
        < dep >Civil</dep >
    </prof >
</ professordb >
```

Question No. 3

(2+3=5 Marks)

- a. Describe the mechanisms for delivery of dynamic content in web servers.
- b. Design an online rail ticket batch processing software with a neat block diagram based on batch sequential architecture.

Question No. 4:

(2+3= 5 Marks)

- a. Describe request processing by a web browser with a neat diagram.
- b. Compare batch sequential data flow architecture with that of pipe and filter.

Question No. 5

(2+3= 5 Marks)

- a. List any four features of XML.
- b. Suggest a suitable data flow architecture to develop an Anti-Braking embedded critical control system, with a neat block diagram showing the data flow in the system.

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**Faculty of Engineering and Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th Semester/2015

15ETCS002027

Date of Test: 16th October 2018

Course Code: CSC402A

Course Title: Web Architecture and Application Development

Term Test - 2

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Any missing data may be assumed appropriately and the justification stated clearly

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

You may take this question paper at the end of the examination for future reference

Question No. 1:

(5 Marks)

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write the most appropriate choice as your answer in the answer booklet. (Each sub question carries half a mark)

1.1 The benefit of an Asynchronous architecture is _____.

- a. Multiple independent agents b. Flexible GUI c. Multiple views d. Loose coupling of modules

- 1.2 Message broker is a typical example of _____.
a. Pipes and filters b. SOA c. Middleware d. Web service
- 1.3 Hierarchical architecture does not support _____.
a. Exchangeability b. Concurrency c. Interactivity d. Security
- 1.4 PAC is specifically built to support _____.
a. Client application b. Database activity c. User interface d. Multiple agents
- 1.5 A typical application of MVC architecture is a/an _____.
a. Distributed system consisting of multiple agent b. Hierarchical structure
c. Web server site application d. Embedded application
- 1.6 Distributed architecture style does not support _____ based application.
a. Client server b. Hierarchical structure c. Broker d. SOA
- 1.7 Business logic layer of a three-tier application is built using _____.
a. User interface b. MVC architecture c. Enterprise Java beans d. Client server, application
- 1.8 Service repository facilitates to discover _____.
a. Service contract b. Services in SOA c. User interface d. Service bus
- 1.9 Service Oriented Architecture is best suited for _____ systems.
a. Small b. Distributed c. Embedded d. Operating
- 1.10 Three-tier system architecture is more common in _____ applications.
a. System software b. Robotic c. E-commerce and B2B d. Artificial Intelligence

Question No 2

(3+2=5 Marks)

- a. Explain the concept of Message oriented middleware and its advantages.
- b. Describe the communication of multiple agents in Presentation Abstraction Control (PAC) architecture.

Question No. 3

(2+3=5 Marks)

- a. Describe Middleware and its functionalities.
- b. Design a purchase process requirement application for an online customer based on hierarchical software architecture. Draw the corresponding data flow diagram.

Question No. 4:

(3+2= 5 Marks)

- a. Explain Service Oriented Architecture (SOA) and its operations.
- b. Describe the benefits of publish subscribe messaging architecture.

Question No. 5

(2+3= 5 Marks)

- a. Describe the importance of service contract in SOA.
- b. Identify a suitable architecture style for a student online registration system for a conference. Draw the corresponding block diagram.

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**Faculty of Engineering and Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th/2015

Date of Test: 20th November 2018

Course Code: CSC402A

Course Title: Web Architecture and Application Development

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Term Test - 3

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Any missing data may be assumed appropriately and the justification stated clearly

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

You may take this question paper at the end of the examination for future reference

Question No. 1:

(5 Marks)

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write the most appropriate choice as your answer in the answer booklet. (Each sub question carries half a mark).

- 1.1 Component based software architecture does not support _____.
- a. Concurrency b. Interactivity c. Incrementalism d. Productivity

- 1.2 Intermediary layer of Service Oriented Architecture (SOA) contains _____
a. User interface b. Database c. Technology gateways d. Processes
- 1.3 SOA is best suited for _____ systems.
a. Small-Medium b. Operating c. Distributed d. Embedded
- 1.4 Three-tiered system architecture is commonly used in _____ applications.
a. E-commerce and B2B b. OS based c. Embedded d. System software
- 1.5 Software Architecture Analysis Method is used to evaluate _____ architecture.
a. Heterogeneous b. Component based c. User interface d. Interaction oriented
- 1.6 The architecture of user interfaces supports its _____.
a. Database b. Look and Feel c. Security d. Services
- 1.7 Application server mediates between web server and _____.
a. Hardware b. Operating system c. User interface d. Backend systems
- 1.8 Web container of Java EE manages the execution of _____.
a. Servlet components b. Java beans c. User interface d. Database
- 1.9 The major benefit of component based software architecture is _____.
a. Concurrency b. Distributed Execution c. Reusability d. Security
- 1.10 Web services are one possible way of realizing the infrastructure aspects of _____.
a. SOA b. Processes c. User interface d. Artificial Intelligence

Question No 2

(1.5+3.5=5 Marks)

- a. Describe different java development platforms.
b. Consider an electronic shopping website to be developed based on process-enabled SOA. It has services such as electronic items, customer, booking and billing, with all the business entities and behaviours.
Identify the different architectural layers and design a process enabled SOA with a block diagram.

Question No. 3

(2+3=5 Marks)

- a. List any four design considerations of developing an architecture for user interface.
b. Describe Java EE container and container types with a diagram.

Question No. 4:

(2+3= 5 Marks)

- a. Differentiate between a web server and an applications server.
b. Explain Java EE architecture with a diagram.

Question No. 5

(2+3= 5 Marks)

- a. Describe the Java EE technologies used in Web tier of multi-tiered applications.
b. Consider the development of an inventory management system for computer parts using heterogeneous software architecture.
Select suitable architectures for the system to fulfil the following requirements and explain the design with a diagram.
- Inventory management system interacts with database and also maintains order processing, daily orders and shipping
 - Satellite computers interact with database for insertion, deletion and update of computer parts records



Faculty of Engineering and Technology
Semester End Examination Question Paper – B.Tech.

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th / 2015

Date of Examination: 12th January 2019

Course Code: CSC402A

Course Title: Web Architecture and Application Development

1SET CS002022

Semester End Examination

INSTRUCTIONS TO STUDENTS:

1. Answer any **FIVE** full questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed
6. Indicate the question number (including its part as applicable) for your answers

Maximum Duration: 3 Hours

Maximum Marks: 100

IMPORTANT:

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

Question 1

(3+3+10+4=20 Marks)

- a. Define Enterprise Java Beans.
- b. Define stateful and stateless session beans.
- c. Differentiate between blackboard architecture and repository architecture styles. Suggest the better architecture style appropriate for developing artificial intelligence based applications and justify.

- d. Design a three-tier web-based, online bookstore application. The features of the web applications are registration, login, search for books, shopping cart and checkout processing. Explain different tiers and their functionalities with a neat block diagram.

(3+3+10+4=20 Marks)

Question 2

- a. Define any six entity relationships in Unified Modeling Language (UML).
b. Explain the request methods in Hypertext Transfer Protocol (HTTP).
c. Suggest a suitable data centric architecture to develop a student based application to store and retrieve semester marks. Represent the architecture with a neat diagram.
d. Design a solution for purchase process requirement application of an online customer, based on appropriate hierarchical software architecture. Draw corresponding data flow diagram.

(6+7+7=20 Marks)

Question 3

- a. Define servlet in Java and draw its life cycle diagram.
b. Explain the basic operations of web servers with a neat diagram.
c. An enterprise application needs to be developed using an asynchronous event-based implicit invocation architecture. The system should notify the supplier to reorder more items, when the enterprise has less than the minimum number of items in stock.
i. Design a software architecture for the enterprise application with a neat block diagram.
ii. Draw a class diagram for the above scenario.

(3+3+7+7=20 Marks)

Question 4

- a. List any three benefits of pipe and filter architectures.
b. Define Java Messaging Service (JMS) and its mode of communication.
c. Explain Service Oriented Architecture (SOA) and the importance of service repository in SOA.
d. Design a hotel reservation system using component-based software architecture. The customer must be able to reserve hotel rooms in a specific hotel within the chain. Customers may change or confirm their reservation.

Question 5

(6+5+5+4=20 Marks)

- a. Define process enabled SOA and list its characteristics.
b. Explain the concept of Message brokers in message oriented middleware.
c. An online bus reservation system needs to be developed. Design an appropriate Model View Controller (MVC) based software architecture with a neat block diagram.
d. A robotic application needs to be developed where the system functionalities are hand gesture analysis, automatic weather update, autonomous movements, iris recognition and human tracking.
Design an appropriate data-centered software architecture with a neat block diagram and justify.

Question 6

(3+3+10+4=20 Marks)

- a. Define a component in component based software architecture.
b. List any three benefits of MVC software architecture.
c. Explain pipe and filter software architecture. Design a pipe and filter architecture to accept random numbers between 1 to 20 from a data source, filter the even numbers and store the numbers greater than 10 into a data sink.
d. Consider a cab booking website to be developed based on networked SOA. It has services such as cab details, customer details, booking and billing, with all the business entities and behaviours.
Identify the different layers and design a networked SOA with a block diagram.

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Faculty of Engineering & Technology

Semester End Examination Question Paper – B. Tech.

Department: Computer Science and Engineering

Course: B. Tech. in Computer Science and Engineering

Semester/Batch: 7th / 2015

Course Code: CSC404A

Date: 11/12/2018

Course Title: Web architecture and Application development

Semester End Examination – Practical/Laboratory

INSTRUCTIONS TO STUDENTS:

1. Answer THE PARTICULAR QUESTION assigned to you by the Examiner
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed

Maximum Duration: 3 Hours

Maximum Marks: 50

Scenario:

An online car accessories store has several items such as stereo, seat covers, lights and touch screens. The accessories attributes are item Id, item name, cost and discount.

Design a database and create a Web application with HTML user interface connecting the database using PHP. The application displays the database details in HTML page in a table format, where items having more than 50% discount are listed.

You are required to document design and implementation including:

- a. Development of ER diagram and class diagram for the above scenario considering a registered user with valid attributes for both the diagrams
- b. Creation of database
- c. Source code with documentation
- d. Result screenshots

e. Analysis and discussion

Sl. No.	Item	Maximum Marks	Marks Obtained
1	ER and Class diagram for the scenario a	5	
2	Database + Source code and documentation + Results + Analysis and Discussion b + c + d + e	$8 + 10 + 5 + 7 = 30$	
3	Viva	15	
	Total	50	
	Final Score	25	

Solution:

a. ER diagram and Class diagram

For given scenario i.e online car accessories store, first ER diagram must be created and class diagram. ER diagram shows how each entity interact with other entities and what all are the functions which an entity will undergo. In this scenario, we have two entities named, user_det and cars_accessories. Each entity has their own attributes such as mentioned below.

User_det table has attributes such as,

- Register_id
- Phone_no
- Address
- User_name

Cars_accessories table has attributes such as,

- Item_id
- Item_name
- Cost



Faculty of Engineering & Technology Term Test Question Paper – B. Tech.

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th / 2015

15ETCS002022

Date of Test: 21th Sep 2018

Course Code: CSE402A

Course Title: Data Mining

Term Test - 1

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed with justification clearly stated.

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

Question No. 1: (5 Marks)

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write any one of the choices as your answer in the answer booklet.
(Each sub question carries ½ (half) mark):

- 1.1 Dimensionality reduction reduces the data set size by removing _____ attributes.
- a. Relevant b. Irrelevant c. Derived d. Composite
- 1.2 Data mining is _____.
- a. The actual discovery phase of a knowledge discovery process
- b. The stage of selecting the right data for a Knowledge Discovery in Databases (KDD) process
- c. Subject-oriented integrated time variant and non-volatile collection of data in support of management
- d. Querying a data base

- 1.3 Euclidean distance measure is _____:
 a. A stage of the KDD process in which new data is added to the existing selection.
 b. The process of finding a solution for a problem simply by enumerating all possible solutions according to some pre-defined order and then testing them
 c. The distance between two points as calculated using the Pythagoras theorem
 d. Not a distance measure
- 1.4 Data that are not of interest to the data mining task is referred to as _____ data.
 a. Missing b. Changing c. Irrelevant d. Noisy
- 1.5 _____ is not a measure of central tendency in data.
 a. Mean b. Median c. Distance d. Variance
- 1.6 Five number summary does not include _____.
 a. Mean b. Median c. First Quartile(Q1) d. Third Quartile(Q3)
- 1.7 A circle in which sectors represents various quantities is referred as _____.
 a. Histogram b. Frequency polygon
 c. Pie chart d. Component Bar chart
- 1.8 In a histogram the area of each rectangle is proportional to _____.
 a. The class mark of the corresponding class interval
 b. The class size of the corresponding class interval
 c. Frequency of the corresponding class interval
 d. Cumulative frequency of the corresponding class interval

- 1.9 _____ is not a special case of Minkowski Distance:

$$dist = \left(\sum_{k=1}^n |p_k - q_k|^r \right)^{\frac{1}{r}}$$

a. $r = 1$ b. $r = 3$ c. $r = 2$ d. $r = \infty$

- 1.10 If X and Y are independent to each other, the coefficient of correlation is _____.
 a. -1 b. 0 c. +1 d. +0.5

Question No. 2:

(3+2= 5 Marks)

- a. Explain different types of data in data mining with suitable examples.
 b. Explain various ways of handle noisy data.

Question No. 3:

Discuss the steps in Knowledge Discovery Process (KDD) with a diagram. (5 Marks)

Question No. 4:

Calculate the cosine, correlation, Euclidean and Jaccard distance measures for the given vectors: $x = (1, 1, 0, 1, 0, 1)$, $y = (1, 1, 1, 0, 0, 1)$. (5 Marks)

Question No.5:

- a. Explain the role of Principal Component Analysis in data mining.
 b. Outline the steps of obtaining Principal Components of a data set. (1+4=5 Marks)
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**Faculty of Engineering & Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th / 2015

Date of Test: 17th Oct 2018

Course Code: CSE402A

Course Title: Data Mining

15ETCS002027

Term Test - 2

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed with justification clearly stated.

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

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Question No. 1:

(5 Marks)

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write any one of the choices as your answer in the answer booklet. (Each sub question carries $\frac{1}{2}$ (half) mark):

1.1 Clustering is an example for _____ learning.

- a. Supervised b. Un-supervised c. Semi supervised d. Competitive

1.2 Classification is an example for _____ learning.

- a. Supervised b. Unsupervised c. Semi supervised d. Competitive

1.3 Time series prediction can be achieved using _____ technique.

- a. Decision tree b. Naive Bayes classifiers c. ARIMA d. Frequent Pattern (FP) Growth

- 1.4 FP Growth algorithm works for _____ data.
 a. Time series b. Spatiotemporal c. Video d. Market basket
- 1.5 Moving Average filter helps to _____ the time series data.
 a. Smoothen b. Compress c. Divide d. Decompress
- 1.6 Residuals can be obtained by _____ the trend with original time series data.
 a. Adding b. Subtracting c. Multiplying d. Dividing
- 1.7 The value of "d" is obtained from _____ the time series data in ARIMA(p,d,q).
 a. Integrating b. Differentiating c. Merging d. Separating
- 1.8 A child trying to learn cycling is an example of _____ learning.
 a. Supervised b. Unsupervised c. Semi supervised d. Reinforcement
- 1.9 Decision tree is a technique used to _____ the data.
 a. Classify b. Cluster c. Summarize d. Minimize
- 1.10 Attribute selection can be achieved using _____.
 a. Information Gain b. Information Extraction c. Summarization d. Abstraction

Question No. 2: (2+3= 5 Marks)

- a. Explain any two measures of interestingness of rules.
- b. Explain supervised and unsupervised learning with an example each.

Question No. 3: (5 Marks)

A database has five transactions. Let minimum support =60%. Find all the frequent item sets using Apriori algorithm.

TID	Items bought
T100	{M, O, N, K, E, Y}
T200	{D, O, N, K, E, Y}
T300	{M, A, K, E}
T400	{M, U, C, K, Y}
T500	{C, O, O, K, I, E}

Question No. 4:

- a) Explain time series data components.
 b) Explain the applications of time series data.

Question No. 5:

Consider the following data set given in Table1. Predict the class label for a test sample (Red Domestic SUV) using the naive Bayes approach. (5 Marks)

Table: 1

Example No.	Color	Type	Origin	Stolen
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Domestic	Yes
6	Yellow	SUV	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Imported	No
9	Red	SUV	Domestic	Yes
10	Red	SUV	Imported	No
	Red	Sports	Imported	Yes



Faculty of Engineering & Technology
Term Test Question Paper – B. Tech.

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th / 2015

Date of Test: 20th Nov 2018

Course Code: CSE402A

Course Title: Data Mining

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Term Test - 3

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed with justification clearly stated.

Maximum Marks: 25

Maximum Duration: 1 Hour

IMPORTANT:

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

(5 Marks)

Question No. 1:

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write any one of the choices as your answer in the answer booklet.
(Each sub question carries ½ (half) mark):

1.1 Measurement that is close to true value is a measure of its _____.

- a. Accuracy b. Usefulness c. Reproducibility d. Precision

1.2 Output of Hierarchical Clustering is _____.

- a) Final estimate of cluster centroids b) Tree showing how close things are to each other
c) Assignment of each point to clusters d) Final estimate of cluster means

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- 1.3 _____ is NOT required by K-means clustering.

 - Defined distance metric
 - Number of clusters
 - Initial guess as to cluster centroids
 - Group members

1.4 The minimum number of variables/ features required to perform clustering is _____

 - 0
 - 1
 - 2
 - 3

1.5 The _____ linkage method uses information on all pairs of distances, not merely the minimum or maximum distances.

 - Single
 - Medium
 - Complete
 - Average

1.6 _____ is a procedure characterized by the development of a tree-like structure.

 - Non-hierarchical clustering
 - Hierarchical clustering
 - Agglomerative clustering
 - Divisive clustering

1.7 _____ statement is true.

 - Cluster analysis does not classify variables as dependent or independent
 - The dendrogram is read from right to left
 - Clustering should be done on samples of 300 or more
 - In cluster analysis, objects with larger distances between them are more similar to each other than are those at smaller distances

1.8 AGNES is a _____ technique.

 - Classification
 - Regression
 - Clustering
 - Prediction

1.9 Clustering Feature (CF) vector is used in _____ clustering technique.

 - K-means
 - DIANA
 - BIRCH
 - Agglomerative Nesting

1.10 A good clustering method produces high quality clusters with _____ intra-class similarity.

 - High
 - No
 - Average
 - Low

Question No. 2: (5 Marks)
Explain any five clustering approaches in data mining with an example for each approach.

Question No. 3: (5 Marks)
Discuss the data mining applications in financial data analysis, retail and telecommunication industries.

Question No. 4: (5 Marks)
Discuss any one algorithm suitable for obtaining the clusters of arbitrary shape in detail.

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Faculty of Engineering & Technology

Semester End Examination Question Paper – B. Tech.

Department: Computer Science and Engineering

Programme: B.Tech (CSE)

Semester/Batch : 7th /2015

15SETCS002028

Date of Examination: 2nd Jan 2019

Course Code: CSC402A

Course Title: Data Mining

Semester End Examination-Theory

INSTRUCTIONS TO STUDENTS:

1. Answer all the five questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed

Maximum Duration: 3 Hour

Maximum Marks: 100

IMPORTANT:

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

Question No. 1:

(4+6+10=20Marks)

- a. Differentiate between data warehouse and database.
- b. Explain the use of data mining in business intelligence with a neat diagram.
- c. Discuss major tasks in data pre-processing with suitable examples.

Question No. 2:

(8+8+4=20Marks)

- a. Explain any two techniques for dimensionality reduction.
- b. Given two objects represented by the tuples (22, 1, 42, 10) and (20, 0, 36, 8), compute the distance between them using Euclidean, Manhattan, Minkowski (with h=3) and supremum distance measures.
- c. Calculate the chi-square value for the following data:

[Handwritten signature]

Color	Red	Green	Yellow
Observed frequency	12	16	20
Expected frequency	16	8	25

(6+4+10=20Marks)

Question No. 3:

- a. Define frequent sets, confidence and support.
- b. Differentiate between "Exploratory Data Mining" and "Predictive Data Mining" with an example for each.
- c. Build FP-tree on the grocery store data shown in Table 1 with a minimum support threshold of 3. Draw FP tree for each transaction. Use FP-Growth to discover the frequent item sets from the FP-tree.

Table 1

Transaction ID	Items
1	f,a,c,d,g,i,m,p
2	a,b,c,f,l,m,o
3	b,f,h,j,o
4	b,c,k,s,p
5	a,f,c,e,l,p,m,n

(8+6+6=20Marks)

Question No. 4:

- a. Explain K-means and PAM (Partitioning Around Medoids) clustering methods with suitable examples.
- b. Describe reinforcement learning and its applications with a neat diagram.
- c. Discuss with an example of a particular business that data mining is crucial to its success.

(10+6+4=20Marks)

Question No. 5:

- a. 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.

Determine the following:

- i. Mean, median of the data.
- ii. Mode and comment on the data's modality
- iii. First quartile (Q1) and the third quartile (Q3) of the data
- iv. Five point summary of the data
- b. Explain the conditions for a time series data to be (i) Pure AR process (ii) Pure MA process and (iii) ARMA process
- c. Discuss the impact of increasing prediction horizon on the prediction accuracy and justify.

Question No. 6:

(6+8+6=20Marks)

- a. Explain any two classifier evaluation metrics.
- b. Discuss various attribute selection methods that can be used in decision trees and the strategy to be followed while selecting a root node at any level.
- c. A sales manager of a home appliances company wants to improve sales of the company appropriate data mining techniques and methods to improve the sales of the company using processing.

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**Faculty of Engineering & Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

1SETCS002024

Programme: B.Tech.

Semester/Batch: 7th /2015

Date of Test: 19th September 2018

Course Code: CSC401A

Course Title: Computational Intelligence

Term Test-1

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed
6. Indicate the question number (including its part as applicable) for your answers

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

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the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed pick and write any one of the choices as your answer in the answer booklet.
Each sub question carries ½ (half) mark);

1 Strong Artificial Intelligence is _____.

- a) The embodiment of human intellectual capabilities within a computer
- b) A set of computer programs that produce output that would be considered to reflect as intelligence if it were generated by humans
- c) The study of mental faculties through the use of mental models implemented on a computer
- d) Learning from the machine

1.2 Artificial intelligence is _____.

- a) Putting your intelligence into computer
- b) Programming with your own intelligence
- c) Making a machine intelligent
- d) Playing a game

1.3 The technique developed by A.M. Turing for determining whether a computer could or could not demonstrate artificial Intelligence is known as _____.

- a) Turing Test
- b) Algorithm
- c) Boolean Algebra
- d) Logarithm

1.4 _____ is/are the component(s) of an expert system.

- a) Inference engine
- b) Knowledge base
- c) User interface
- d) Inference, Knowledge base and user Interface.

1.5 A computer vision technique that relies on image templates is _____.

- a) Edge detection
- b) Binocular vision
- c) Model-based vision
- d) Robot vision

1.6 Professor _____ from Stanford University coined the term 'artificial intelligence' in 1956 at a conference held at Dartmouth College.

- a) David Levy
- b) John McCarthy
- c) Joseph Weizenbaum
- d) Hans Berliner

1.7 The primary interactive method of communication used by human is _____.

- a) Reading
- b) Writing
- c) Speaking
- d) Feeling

1.8 One of the main challenges of NLP is handling _____.

- a) Ambiguity of Sentences
- b) Tokenization
- c) POS-Tagging
- d) Meaning of the sentences.

1.9 A rule-based system represents knowledge in terms of a _____ that guide in inferring whether a relation in a query is satisfied.

- a) Raw Text
- b) Set of rules
- c) Summarized Text
- d) Collection of various Texts

1.10 _____ ceases the growth of forward chaining.

- a) Atomic sentence
- b) Complex sentence
- c) No further inference
- d) Handling error

Question No. 2

(2 + 3 = 5 Marks)

- a. Compare weak and strong AI (Artificial Intelligence) with an example each.
- b. Classify the various tasks of AI.

Question No. 3

(2 + 3 = 5 Marks)

- a. Explain the importance and role of knowledge in an Artificial System.
- b. Describe one essential application of AI and justify.

Question No. 4

(2 + 3 = 5 Marks)

- a. List the subsystems required and to build an Expert System with an example.
- b. Design the subsystems for the example in Q.4.a.

Question No. 5

(2+ 3 = 5 Marks)

- a. Identify the possible meaningful words that are obtained by unscrambling the word "clammers".
- b. Write the syntactic grammar and build the parse tree for the given sentence: "The computer said that a fatal error occurred."

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**Faculty of Engineering and Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B. Tech.

15ETCS002027

Semester / Batch: 7th / 2018

Date of Test : 15th October 2018

Course Code: CSC401A

Course Title: Computational Intelligence

Term Test 2

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed

Maximum Duration: 1 Hour

Maximum Marks: 25

Question No. 1:

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write any one of the choices as your answer in the answer booklet. (Each sub question carries $\frac{1}{2}$ (half) mark):

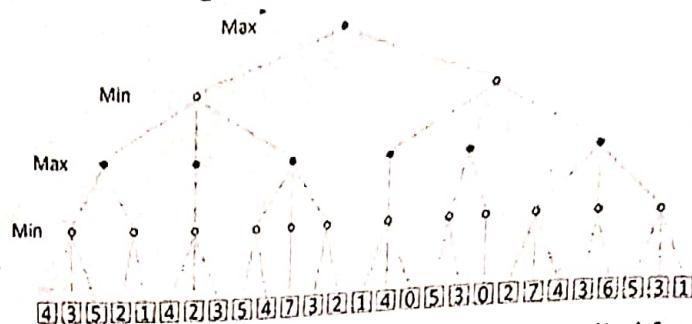
- 1.1 The online-dfs-agent work in _____.
 a) Irreversible state space b) Reversible state space
 c) Searchable state space d) No space
- 1.2 The _____ depends on the precepts and actions available to the agent.
 a) Agent b) Sensor
 c) Design problem d) Environment
- 1.3. _____ are used for tracking uncertain events.
 a) Filtering algorithms b) Sensors
 c) Actuators d) Environment
- 1.4. _____ algorithm can operate over the joint state space.
 a) Decision-making b) Learning
 c) Complex d) Decision-making & Learning
- 1.5. The environment of a crossword puzzle is _____.
 a) Static b) Dynamic
 c) Semi Dynamic d) Quasi Static
- 1.6. _____ approach is the best way to go for Game playing problem.
 a) Linear b) Heuristic
 c) Random d) Optimal
- 1.7. The process of removing detail from a given state representation is called _____.
 a) Extraction b) Abstraction
 c) Information Retrieval d) Mining of data
- 1.8 The _____ is a touring problem in which each city must be visited exactly once. The aim is to find the shortest tour.
 a) Shortest path between a source and a destination
 b) Travelling Salesman problem
 c) Map coloring problem
 d) Depth first search
- 1.9. Web Crawler is a/an _____ agent.
 a) Intelligent goal-based b) Problem-solving
 c) Simple reflex d) Model based
- 1.10 _____ search is complete and optimal when $h(n)$ is consistent.
 a) Breadth-first b) Depth-first
 c) Best-first and Depth-first d) A*

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Question No. 2:

(2.5+2.5 = 05 Marks)

- a. Apply Min-Max algorithm for the given tree.



- b. Explain different cases where pruning can be applied for the given tree in Q 2.a, and justify.

Question No. 3:

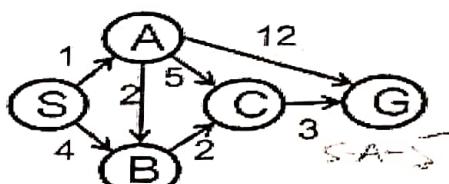
(1+2+2= 05 Marks)

- a. Mention different structure of Software Agent.
 b. Explain any one structure mentioned in Q3a with a diagram.
 c. Describe PEAS of an Agent used for Medical diagnosis system.

Question No. 4:

(2.5+2.5= 05 Marks)

- a. Write A* algorithm and explain the steps.
 b. Apply A* algorithm for the given graph.

State-Space Graph

State	H
S	7
A	6
B	2
C	1
G	0

Question No. 5:

(2+3= 05 Marks)

Consider the following sentences:

- John likes all kinds of food.
- Apples are food.
- Chicken is food
- Anything any one eats and isn't killed by is food
- Bill eats peanuts and is alive
- Sam eats everything Bill eats.
 - a. Translate these sentences in to formulas in predicate logic.
 - b. Prove that John likes peanuts using forward and backward chaining.

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**Faculty of Engineering and Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B. Tech.

150TCS002-027

Semester / Batch: 7th / 2018

Date of Test : 15th November 2018

Course Code: CSC401A

Course Title: Computational Intelligence

Term Test -3

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

Question No. 1:**(05 Marks)**

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write any one of the choices as your answer in the answer booklet. (Each sub question carries $\frac{1}{2}$ (half) mark):

1.1 One of the main disadvantages of hill-climbing search is that it _____.

- a) Terminates at local optimum and does not find optimum solution
- b) Terminates at global optimum and does not find optimum solution
- c) Does not find an optimum solution and fails to find a solution
- d) May fail to find a solution

1.2 Search algorithm that keeps track of k states rather than just one is _____.

- a) Hill-Climbing
- b) Local Beam
- c) Stochastic hill-climbing
- d) Random restart hill-climbing

1.3 Consider the problem of preparing a schedule for a class of students. This problem is a type of a _____.

- a) Search Problem
- b) Backtrack Problem
- c) CSP
- d) Planning Problem

1.4 The term _____ is used for a depth-first search that chooses values for one variable at a time and returns when a variable has no legal values left to be assigned.

- a) Forward search
- b) Backtracking search
- c) Hill algorithm
- d) Reverse-Down-Hill search

1.5 The two main features of a Genetic Algorithm (GA) are _____.

- a) Fitness function & Crossover techniques
- b) Crossover techniques & Random mutation
- c) Individuals among the population & Random mutation
- d) Random mutation & Fitness function

1.6 A Genetic Algorithm (or GA) is a variant of _____ search in which successor states are generated by combining two parent states.

- a) Hill-Climbing
- b) Local Beam
- c) Stochastic beam
- d) Random restart hill-climbing

1.7 The improvement in online smoothing is revealed by _____.

- a) Matrix formulation
- b) CSP
- c) HMM
- d) Markov chain

1.8 The process in HMM is described as a _____.

- a) Literal
- b) Single random variable
- c) Single discrete random variable
- d) Uniform random variable

1.9 A perceptron is _____.

- a) A single layer feed-forward neural network with pre-processing
- b) An auto-associative neural network
- c) A double layer auto-associative neural network
- d) A neural network that contains feedback

1.10 A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 10, 5 and 20 respectively. The output will be _____.

- a) 238
- b) 76
- c) 119
- d) 123

(2.5+2.5 = 05 Marks)

Question No. 2:

1. a. Explain the Hill-Climbing Algorithm showing all the steps.
b. Identify different points associated with the Hill Climbing Algorithm for the data given in Table 1.

1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
1	2	3	2	2.5	3	4	4	3	2	3	4	5	6	7	6	5	4	3

(2.5+2.5= 05 Marks)

Question No. 3:

- a. Explain the Constraints Satisfaction Algorithm showing all the steps.
b. Illustrate an application involving Constraint Satisfaction problem.

(2.5+2.5= 05 Marks)

Question No. 4:

- a. Explain Genetic Algorithm showing all the steps.
b. Illustrate an application showing the working of Genetic Algorithm.

(2+3= 05 Marks)

Question No. 5:

- a. Draw a Markov process showing the three hidden states Sunny, Rainy and Cloudy weather and the observed states Dry, Dryish, Damp and Soggy conditions.

		Seaweed			
		Dry	Dryish	Damp	Soggy
weather	Sun	0.60	0.20	0.15	0.05
	Cloud	0.25	0.25	0.25	0.25
	Rain	0.05	0.10	0.35	0.50

		weather today		
		Sun	Cloud	Rain
weather yesterday	Sun	0.5	0.25	0.25
	Cloud	0.375	0.125	0.375
	Rain	0.125	0.625	0.375

- b. Given two consecutive days data Sunny /dry, Rainy/damp, determine the probability of condition being cloudy and soggy, the day after tomorrow.

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**Faculty of Engineering and Technology
Semester End Examination Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B.Tech

Semester/ Batch: 7th / 2016

Date of Examination: 31st Jan 2018

Course Code: CSC401A

Course Title: Computational Intelligence

15ETCS002027

Semester End Examination- Theory

INSTRUCTIONS TO STUDENTS:

1. Answer any **FIVE** full questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Missing data may be appropriately assumed

Maximum Duration: 3 Hours

Maximum Marks: 100

Question No. 1

- a. Write pseudo code to create a generic knowledge based agent.
 b. Describe PEAS to create the Wumpus world.
 c. Explain a semantic network with an example to describe a person (e.g. yourself) with the network consisting of ten nodes.

(4+9+7=20 Marks)

Question No. 2

- a. Compare AI, machine learning and deep learning.
 b. Explain the following terms that arise in neural networks with an example each.
 i. Input ii. Output iii. Activation function iv. Perceptron v. Feed forward network vi Back propagation
 c. Explain different steps used in fuzzy logic with a block diagram.

(10+10=20 Marks)

Question No. 3

- a. Consider an HMM model with two hidden states, S_1 and S_2 , with the initial probabilities as 0.4 for S_1 and 0.6 for S_2 . The Transition (T) and Emission (E) probability matrices are given below:

T	S_1	S_2
S_1	0.25	0.75
S_2	0.75	0.25

E	A	C	T	G
S_1	0.2	0.2	0.3	0.3
S_2	0.3	0.3	0.2	0.2

- i. Draw the transition diagram showing the emission state for the given data.
 ii. Determine the most likely path generating the sequence X = TAC.
 iii. Compute the probability of generating the sequence X = TACG and being at s_2 while generating the symbol C.
- b. In New Delhi, 51% of the adults are males and 49% are females. One adult is randomly selected for a survey involving credit card usage.
- i. Determine the probability that the selected person is a male.
 - ii. Determine the probability that the selected subject is a female given that the selected survey subject was smoking a cigar. It was observed that 9.5% of males smoke cigars, whereas 1.7% of females smoke cigars.

Question No. 4

(4+6+10=20 Marks)

- a. Explain A* algorithm with an example.
- b. Discuss three essential features that happen every instance in life naturally that a designer of an agent or robot should incorporate in the design.
- c. Consider the problem of changing a flat tyre. More precisely, the goal is to have a good spare tyre properly mounted onto the car's axle, where the initial state has a flat tyre on the axle and a good spare tyre in the trunk. To keep it simple, here are just four actions: removing the spare from the trunk, removing the flat tyre from the axle, putting the spare on the axle, and leaving the car unattended overnight. We assume that the car is in a particularly bad neighbourhood, so that the effect of leaving it overnight is that the tyres disappear.
- i. Plan the necessary actions required to replace the tyre and move on.
 - ii. Represent the above statements using propositional logic.

Question No. 5

(4+4+4+4+4=20 Marks)

Develop a software agent to work in real time in the stock exchange to buy and sell stocks. It should accept user input such as the names of Companies, number of the Stocks and the price of the Stock at which it has to be bought or sold. It should have a provision to watch for indications of any drastic fluctuations in the market to trigger appropriate changes in strategy to place a different order. Multiple agents have to be incorporated in the development.

- a. Explain the environment for agents.
- b. Design the sensors and the actuators needed for the successful working of the agent.
- c. Plan the roles of agents and the coordination amongst the agents, if any.
- d. Develop the knowledge bank needed to successfully carry out operations.
- e. Represent the performance of the agent. Mention any one ambiguity that may emerge in the process and resolve the same.

Question No. 6

(4+4+4+4+4=20 Marks)

- a. Develop a robot to work in the kitchen to cook food in the household of a busy working couple with aged parents and a child at home.
 - a. Develop the knowledge bank needed to successfully prepare vegetable sandwiches for breakfast.
 - b. Explain the kitchen environment.
 - c. Design the sensors and the actuators needed for the successful working of the robot.
 - d. Explain your plan of action to incorporate strong AI.
 - e. Measure the performance of the robot.

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Faculty of Engineering and Technology
Term Test Question Paper – B. Tech.

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th / 2015

Date of Test: 19th September 2018

Course Code: CSE403A

Course Title: Enterprise Computing

15ETCS002027

Term Test-1

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Any missing data may be assumed appropriately and the justification stated clearly

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

You may take this question paper at the end of the examination for future reference

Question No. 1:

(5 Marks)

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write the most appropriate choice as your answer in the answer booklet. (Each sub-question carries 1/2 a mark)

1.1 Enterprise computing is _____ process centric.

- a. Data b. Customer c. Functional d. Business

1.2 The _____ is used to define the usage of data and the relationships between one data element and another.

- a. Data models b. Data objects c. Models d. Objects

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1.3 A business process is a sequence of steps designed to produce a _____.
a. Workflow b. Process Model c. Service d. Process Map

1.4 A/An _____ is a building block that enables interaction among components.
a. Link b. Connector c. Interface d. Configuration

1.5 A _____ is an atomic activity that is included within a Process.
a. Sub process b. Workflow c. Process modeling d. Task

1.6 The _____ represent participants in an interactive Business Process Diagram.
a. Pools b. Lanes c. Gateways d. Complex gateways

1.7 The _____ API provides the ability to perform distributed transactions on more than one data store in the network at the same time.
a. JPA b. J2EE c. JTTA d. JTA

1.8 Interaction between pools is handled through _____ flow/s.
a. Sequence b. Message c. Association d. Sequence and Association

1.9 A data source must be registered on the server and is specified using the _____ name.
a. JPA b. JTA c. JNDI d. JMDI

1.10 ORM stands for _____.
a. Operational risk management b. Object relational mapping
c. Object risk management d. Object relational management

Question No. 2: (2+3=5 Marks)

- Describe any four desirable qualities of an enterprise application.
- Explain the nature of an enterprise.

Question No. 3: (2+3=5 Marks)

- Differentiate primary process and support process.
- Explain the three orthogonal aspects of workflow matrix with an example.

Question No. 4: (3+2=5 Marks)

- Describe the architecture of BPM system with a block diagram.
- "The general JDBC architecture is a multi-tiered architecture". Justify.

Question No. 5: (2+3=5 Marks)

- Distinguish between BPMS and BPM.
- Consider the scenario of medicine (both prescription and non-prescription) ordering and delivery system.
 - Draw a business process diagram using BPMN.
 - Explain the flow of business.

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**Faculty of Engineering and Technology
Term Test Question Paper – B. Tech.**

Department: Computer Science and Engineering

Programme: B. Tech.

Semester/Batch: 7th /2015

Date of Test: 15th November 2018

Course Code: CSE403A

Course Title: Enterprise Computing

15ETCS002027

Term Test-3

INSTRUCTIONS TO STUDENTS:

1. Answer all the questions
2. Use only SI units
3. Use of non-programmable scientific calculator is permitted
4. Use of data handbook permitted wherever applicable
5. Any missing data may be assumed appropriately and the justification stated clearly

Maximum Duration: 1 Hour

Maximum Marks: 25

IMPORTANT:

You may take this question paper at the end of the examination for future reference

Question No. 1:

(5 Marks)

For the sub questions 1.1-1.10, multiple choices are indicated as possible answers. You are supposed to pick and write the most appropriate choice as your answer in the answer booklet. (Each sub-question carries 1/2 a mark)

- 1.1 A _____ describes software components and assigns the functionality of the system to these components.
- a. Software developer b. Software architect c. System designer d. System architect
- 1.2 _____ helps systems remain scalable and bridges the business/IT gap.
- a. MVC b. SOA c. PAC d. SOAP
- 1.3 The _____ operation is NOT in SOA.
- a. Publish b. Create c. Find d. Bind/Invoke

1.4 Services are used to encapsulate algorithms for complex calculation and business rules are

- a. Information-Centric b. Module-Centric c. Data-Centric d. Logic-Centric

1.5 _____ are NOT intermediary services.

- a. Technology gateways b. Facades
c. Adapters gateways d. Functionality-Adding Services

1.6 The _____ type of web application framework is used for Java Server Faces.
a. Component b. Request c. File d. Form

1.7 The concept of _____ assures the recipient that the data was neither damaged nor altered during transmission and transaction processing.
a. Authentication b. Confidentiality c. Data privacy d. Data integrity

1.8 The _____ stores the service contracts of the individual services in SOA.
a. Application b. Service c. Service bus d. Cache

1.9 A _____ SOA increases the maintainability of an enterprise application landscape.
a. Data-enabled b. Process-enabled c. Networked d. Fundamental

1.10 The _____ is similar to an architectural design pattern in PAC.
a. MVC b. GUI c. MVVC d. API

Question No. 2:

(2+3 = 5 Marks)

- a. Describe any two types of risks involved in enterprise applications.
b. Discuss the security challenges involved in J2EE.

Question No. 3:

(2+3 = 5 Marks)

- a. Differentiate between authentication and authorization with an example.
b. Explain different modes of Secure Sockets Layer protocol.

Question No. 4:

(2+3 = 5 Marks)

- a. Differentiate between malicious and non-malicious attacks.
b. Consider an online railway ticket booking agency that wants to develop a train monitoring and control system to avoid collisions during train arrival/departure to/from a station. Identify appropriate design patterns. Justify your choice.

Question No. 5:

(2+3 = 5 Marks)

- a. Differentiate between Technology Gateways and Functionality-Adding Services.
b. Consider a gaming industry that wants to develop an online multiplayer survival/shooting game. The game has the following features:
• The user needs login credentials to play the game
• There are different types of modes available (solo, duo and squad)
• There are different types of locations available (Desert, Grass lands and Snow lands)

In this context, design the most suitable SOA architecture with a block diagram. Justify your choice.



**RAMAIAH
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Faculty of Engineering & Technology

Semester End Examination Question Paper – B. Tech.

Department: Computer Science and Engineering

Programme: B. Tech

Semester/Batch: 7th / 2015

Date of Examination: 04th January 2018

Course Code: CSE403A

Course Title: Enterprise Computing

1SETCS002D22

Semester End Examination-Theory

INSTRUCTIONS TO STUDENTS:

1. Answer any **FIVE** full questions
2. Use of non-programmable scientific calculator is permitted
3. Use of data handbook permitted wherever applicable
4. Missing data may be appropriately assumed
5. Indicate the question number (including its part as applicable) for your answers

Maximum Marks: 100

Maximum Duration: 3 Hours

IMPORTANT:

You may take this question paper away at the end of the examination. Please keep it in a safe place for future reference

Question 1

(6+10+4=20 Marks)

- a. List any six desirable qualities of an enterprise application.
- b. Explain the elements of software architecture with a graphical representation.
- c. An employee decides to take leave of absence in a corporate organization. Identify the business process and draw the corresponding modelling diagram using BPMN notation.

Question 2

(4+3+8+5=20 Marks)

- a. Define primary and support processes with an example.
- b. List any three processes of BPMS and BPM each.
- c. Discuss the concept of software containers and their types in Java Enterprise Edition architecture.
- d. An organization known as "Twister" is responsible for providing multimedia streaming platform for the customers. The customer can use the platform to upload the content and expose through different kinds of applications such as Web applications and mobile applications. Identify the most suitable tier architecture for implementing the system. Justify.

Question 3

(3+3+6+8=20 Marks)

- a. Define three types of connectors in BPMN.
- b. Differentiate between workflow and BPM.
- c. Consider the placement department in any University wherein multiple companies or organisations visit the University for the Placement Drive. Each company has a different recruitment process such as

PVR

online/offline aptitude test, followed by group discussion or a test related to a specific requirement. Explain the three orthogonal aspects of workflow matrix for the given scenario.

- d. The "Intel" organisation and "AMD" are known for developing computer parts such as processors, graphics card. The "Intel" organisation has decided to merge with "AMD" for development of a new prototype which combines principles of Intel processor and AMD's graphics processor. Assume that both organisations have well established database connectivity for various other purposes. In this context,
- i. Design an appropriate database connectivity for the new enterprise information system tier.
 - ii. Explain the utilization of JPA and JTA in the above design.

Question 4

(2+4+10+4=20 Marks)

- a. Differentiate between 3-Tier and N-Tier architectures.
- b. Explain the architecture of BPM system with a block diagram.
- c. Explain the life cycle of each one of Java Servlets and Java Server Pages with a block diagram.
- d. Consider an online railway ticket booking website. A customer fills a web form and clicks submit button. The server receives the customer's request, validates the inputs, performs business logic (such as store the customer details in database) and returns a response back to the customer. In this context, identify and design an appropriate design pattern for web form handling. Justify.

Question 5

(8+4+4+4=20 Marks)

- a. Describe any four risks involved in replacing legacy systems.
- b. "Middleware services help an application to locate services transparently across the network". Justify with an example.
- c. "An Architect provides solutions for problems related to scale and changes in software development and IT management in an Enterprise". Justify.
- d. Consider a cartoon industry, producing serials, movies and comics for different genre. The industry wants to expand the online services to multiple platforms such as mobile applications, Web applications etc. The process involved is watching or downloading online videos, movies and comics. In this context, identify the type of EJB's that is most suitable for each identified business process. Justify.

Question 6

(6+3+7+4=20 Marks)

- a. Describe different modes of Secure Sockets Layer protocol with an example each.
- b. Describe the security challenges involved in J2EE.
- c. Consider a fees payment process in a university that wants to develop an online fee payment service. The service has the following features:

- There are different modes of payment available (credit, debit and net-banking)
- Students can download fees receipt

In this context, design the most suitable SOA architecture with a block diagram. Justify your choice

- d. Consider a University with faculty members for different programmes, like B-Tech, M-Tech, and MBA. The university wants to incorporate online/offline teaching system for different programmes. The processes involved are:

- Learning a subject via pre-recorded videos
- Live interactive sessions via third party applications
- Feedback collection from students

The live interactive sessions are recorded and it is automated to store their pre-recorded videos for future use. The student can access offline within the university and online from outside the university. Each student should be registered and authenticated. In this context, design the most suitable SOA architecture with a block diagram. Justify your choice.

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