Registration No.: | | | | | | | | | | |

Total Number of Pages: 02

Course: M.Tech
Sub_Code: P2CTCC01

2nd Semester Regular/Back Examination: 2024-25
SUBJECT: Computer Graphics
BRANCH(S): COMPUTER SCIENCE AND ENGG
Time: 3 Hours
Max Marks: 100
Q.Code: S299

Answer Question No.1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) What is the difference between Raster Scan System and Random Scan System?
b) Define Half –Toning.
c) State the equation for 2D Rotation.
d) Distinguish between Window and View Port.
e) Rotate the point (4, 3) by an angle 45 degree about origin.
f) Define the concept of convex hall.
g) In 512 * 512 display system with an access rate of 200 ns/pixel. What is the refresh rate?
h) Define Painters Algorithm.
i) Consider an object ABC with coordinates A (1, 1), B (10, 1), and C (5, 5). Rotate 90 degree in counter clockwise.
j) What are the storage requirements for 1024 * 1024 * 24 resolution for a 30 second animated film as video rate 30 frequency / second.

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Define CRT. State the components and basic operations of CRT.
b) Differentiate between Perspective and Parallel projections.
c) Prove that successive translations are commutative and additive in nature.
d) What do you mean by Surface Rendering? Distinguish between Gouraud and Phong Shading.
e) Define Polygon Filling Algorithm. Explain in-details: Boundary Fill Algorithm and Flood Fill Algorithm.
f) What do you mean Fractal? Explain the classifications of fractals.
g) Perform Shearing in X direction to a unit square with Shx = 3. For a unit square at origin in the four points as: A(0, 0) B(1, 0) C(0, 1) D(1, 1).
h) Determine the points over the circle centre at origin radius = 8 and centre of the circle is (2, 3) using midpoint circle algorithm.

i) Explain in details Window to Viewport Mapping Transformation.

j) Explain the various visible surface detection algorithm in details.

k) What do you mean by Cohen Sutherland Line Clipping Algorithm? Draw a window with Xmin = –3 and X max = 2, Y min = 1 and Y max = 6. Clip the line AB where A (-4, 2) and B (-1, 7).

l) Perform Scaling to a triangle having endpoints A(1, 1) ,B(3, 1),C(2, 4) with Sx = 2 and Sy = 3.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four) (16 x 2)

Q3 What do you mean by Projection? Derive the transformation for parallel and perspective projection in details. **(16)**

Q4 What do you mean by Bresenhams Line Drawing Algorithm? Digitise a line segment having end points (20, 10) and (30, 18) using Bresenhams Line Drawing Algorithm. **(16)**

Q5 What do you mean by polygon clipping? Explain Sutherland–Hodgman algorithm with suitable examples. **(16)**

Q6 What do you mean by Animation? State the various types of animation and methods of controlling it. **(16)**

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Course: M.Tech
Sub_Code: P2CTCC02

2nd Semester Regular/Back Examination: 2024-25
SUBJECT: Software Engineering
BRANCH(S): COMPUTER SCIENCE AND ENGG
Time: 3 Hours
Max Marks: 100
Q.Code: S371

Answer Question No.1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) What is the Fountain Model in software development?
b) Define COCOMO and its use.
c) What is the difference between Cohesion and Coupling?
d) Define the term 'Object' in Object-Oriented Technology.
e) What are the 4P's in software engineering?
f) Explain the use of CRC cards in object-oriented design.
g) What is a Use Case in UML?
h) Differentiate between Class Diagram and Object Diagram.
i) What is polymorphism in object-oriented programming?
j) Mention any two metrics used in object-oriented design.

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Describe the Unified Process Model with a diagram.
b) Explain Function Point (FP) Metric with an example.
c) Discuss the significance of Encapsulation in OO Technology.
d) Explain Rumbaugh's Object Modeling Technique (OMT).
e) Describe different types of UML diagrams.
f) What is the importance of Domain Object Model in software development?
g) Compare Adhoc based and Object-Oriented design techniques.
h) Define Sequence Testing and its significance in integration testing.
i) Illustrate Booch Notation with an example.
j) What is the purpose of the Class Classification Approach?
k) Describe Component Level Design in object-oriented design.
l) How does Web Engineering metrics differ from traditional software metrics?

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four) **(16 x 2)**

Q3 Discuss various software process models. Explain the Component-Based Software Development Model and 4P Approach with examples. **(16)**

Q4 Explain in detail the object-oriented analysis process. Describe different types of classes and various approaches to class classification with reference to a case study. **(16)**

Q5 Describe the architecture of UML. Explain various UML diagrams with examples. Highlight the importance of each diagram in the software development life cycle. **(16)**

Q6 What are the different software metrics used in object-oriented development? Discuss process, product, and project metrics in detail with their applications. **(16)**

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Course: M.Tech
Sub_Code: P2CTCC03

2nd Semester Regular/Back Examination: 2024-25
SUBJECT : Distributed Database Management Systems
BRANCH(S): COMPUTER SCIENCE AND ENGG
Time: 3 Hours
Max Marks: 100
Q.Code: S390

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions :** **(2 x 10)**

a) Write a query using a database link to fetch employee data from a remote database.
b) Define transparency in distributed databases.
c) What is Phantom Phenomenon?
d) What is data fragmentation?
e) What is a timestamp in distributed systems?
f) What is the role of 2PC (Two-Phase Commit) protocol?
g) Explain reference architecture in distributed databases.
h) List two reasons why we may choose to define a view?
i) Define integrity constraints in a distributed database.
j) What is a homogeneous distributed database system?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) What do you mean by semi join in distributed db?
b) Write short notes on concurrency control foundations.
c) Discuss the concept of Distributed Query Processing and the various query optimization techniques used.
d) Explain with the help of examples, the concept of insertion anomalies, and deletion anomalies.
e) Write short notes on Semantic Data Control and its role in distributed systems.
f) Explain the architectural models for Distributed DBMS and differentiate between Homogeneous and Heterogeneous systems.
g) Briefly explain intersystem communication in IBM distributed databases.
h) Write a SQL query to demonstrate use of a view to hide data location from the user.
i) What is the role of data encryption and database auditing in distributed databases?
j) During its execution, a transaction passes through several states, until it finally commits or aborts. List all possible sequences of states through which a transaction may pass. Explain why each state transition may occur.

k) Explain fragmentation and allocation in Distributed Database Design. Why are they important?

l) Briefly discuss various features of Distributed Database Systems and their advantages?

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four) **(16 x 2)**

Q3 Explain the features of distributed and centralized databases. How does distribution transparency help in achieving seamless data access? **(16)**

Q4 What is Distributed Query Processing? Explain the process involved and various query optimization techniques used in distributed databases. Highlight their advantages with examples. **(16)**

Q5 Discuss in detail the different types of fragmentation and allocation strategies in Distributed Database Design. Why is proper fragmentation important in distributed systems? **(16)**

Q6 Describe the concept and management of Database Links in distributed databases. How transparencies (like location and naming) are handled through links, synonyms, and views? **(16)**

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Course: M.Tech
Sub_Code: P2CTCC07

2nd Semester Regular/Back Examination: 2024-25
SUBJECT: Data Ware Housing & Data Mining
BRANCH(S): COMPUTER SCIENCE AND ENGG
Time: 3 Hours
Max Marks: 100
Q.Code: S460

Answer Question No.1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) What is SMP implementation Explain briefly?
b) What do you mean by Data Mining Task primitives?
c) Explain data verses Metadata.
d) Differentiate between Discovery verses Prediction.
e) Write in brief about schemas in multidimensional data model.
f) Difference between CART and CHAID.
g) What is the use of Cleanup & transformation Tools?
h) Write short notes Star schema.
i) Difference between Nearest Neighbor and Clustering.
j) Explain how Clustering is used for out layer analysis

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) What are steps in designing the data warehouse? Explain.
b) Differentiate between supervised and unsupervised learning method.
c) Define outlier. State at least two applications of outlier mining.
d) Given two objects represented by the tuples (22, 1, 42, and 10) and (20, 0, 36, 8). Compute the Euclidian and Manhattan distance between the two objects.
e) List two advantages of feature reduction. How dimensionality reduction is achieved using Principal Component Analysis (PCA)?
f) Define the difference between Shared Memory Architecture and Shared Disk Architecture.
g) Explain Server H/W Architecture RISC verses CISC.
h) Explain how to map the Data Warehouse to Multi Processor Architecture.
i) Define the difference, Business, & Data Warehouse.
j) Explain with example, Parallel Processors and Cluster Systems.
k) What do you mean by Distributed Memory Architecture explain briefly.
l) Write short notes on (I) Decision Tree (II) Growing the Tree

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four) **(16 x 2)**

Q3 How can we find frequent item sets using candidate generation? Discuss the Apriori algorithm with example. How can we further improve the efficiency of Apriori based mining? Justify your answer with respect to hash- based technique and vertical data format. There are 4 transactions in the database given below. Illustrate the Apriori algorithm to find the frequent item sets from the given database. Given the minimum support threshold is 60%. **(16)**

Transaction ID	Items Bought
1	Shoes, Shirt, Jacket
2	Shoes,Jacket
3	Shoes, Jeans
4	Shirt, Sweatshirt

Q4 Discuss *k*-Means and *k*-Mediods algorithm. Illustrate the strength and weakness of *k*-Means in comparison with the *k*-Mediods algorithm. **(16)**

Q5 Explain the major ideas of naïve Bayesian classification. For the day <sunny, cool, high, strong>, what's the play prediction? **(16)**

Day	Outlook	Temp	Humidity	Wind	Play Tennis
Day1	Rain	Cool	Normal	Weak	No
Day2	Rain	Cool	Normal	Weak	No
Day3	Overcast	Hot	High	Weak	No
Day4	Rain	Mild	High	Weak	Yes
Day5	Rain	Cool	Normal	Weak	Yes
Day6	Rain	Cool	Normal	Strong	No
Day7	Overcast	Cool	Normal	Strong	Yes
Day8	Sunny	Mild	High	Weak	No
Day9	Sunny	Cool	Normal	Weak	Yes
Day10	Rain	Mild	Normal	Weak	Yes
Day11	Sunny	Mild	Normal	Strong	Yes
Day12	Overcast	Mild	High	Strong	Yes
Day13	Overcast	Hot	Normal	Weak	Yes
Day14	Rain	Mild	High	Strong	No

Q6 The following table lists the advertising dollars spent (in thousands) and sales (in millions) for last year by a digital electronics company. If the company were to spend $275,000 on advertising, what would you predict the sales level to be? **(16)**

Month	Sales	Advertising
January	100	6.5
February	110	7.8
March	112	6
April	115	5.6
May	117	6.2
June	116	6.3
July	118	6.5

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Course: M.Tech
Sub_Code: P2CTCC11

2nd Semester Regular/Back Examination: 2024-25
SUBJECT: Mobile Computing
BRANCH(S): Computer Science and Engineering
Time: 3 Hours
Max Marks: 100
Q.Code: S557

Answer Q1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Mention one advantage and one disadvantage of mobile computing.
b) State two differences between 2G and 3G network.
c) What are the reasons for delays in a GSM system for packet data traffic?
d) Write the advantage and limitation of base station subsystem GPRS protocol?
e) Enlist all the final methods implemented by Secure Servlet that provide the information required by the Security Policy as basis for decision in pervasive web application
f) Define inclination angle and elevation angle in the context of satellite communication.
g) What is the difference between soft handoff and hard handoff?
h) How a scatternet does differ from a piconet in Bluetooth?
i) Differentiate between wireless access network unit and wireless access Subscriber unit.
j) Why cellular IP cannot be used in place of mobile IP?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) How are the calls set up takes place between the mobile users and the Wireline users in PCS network?
b) What are the primary goals of the WAP Forum efforts and how are they reflected in the initial WAP protocol architecture?
c) Explain how tunneling works in mobile IP. Describe the pros and cons of all the methods involved in tunneling.
d) Enumerate the advantages and disadvantages of using CDMA for a cellular network.
e) Describe the interaction between authentication servlet and application servlet via the session object in pervasive web application.
f) Explain with diagram, how a correspondent mobile node on a visit sends and receives IP packet to and from another MN also on a visit at another foreign Network. How is encapsulation done in mobile IP?

g) Explain the various applications of mobile computing.

h) Define channel assignment. Differentiate between static and dynamic channel Assignment. Under what circumstances, is static channel assignment normally used?

i) Draw the WAP architecture. Discuss its advantages and disadvantages.

j) Why do MAC scheme in wired network fail in wireless networks and how does the multiple access with collision avoidance scheme work?

k) What is handover? Write the two basic reasons for a handover. Explain the various handover scenarios in GSM Network with suitable diagram.

l) Describe the main steps of inter-BS and inter-MSC handoff procedure.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four) **(16 x 2)**

Q3 a) List-out the main elements of GSM system architecture and describe their functions. How is localization, location update, roaming, etc. done in GSM and reflected in the data base? **(8)**

b) Analyze the differences and similarities between FDMA, TDMA, SDMA, and CDMA in managing communication channels. **(8)**

Q4 a) Evaluate the effectiveness of the GSM architecture in terms of scalability and reliability **(8)**

b) What are the security issues in GSM and how security of GSM is achieved? **(8)**

Q5 a) How does each field in the IEEE 802.11 MAC frame format contribute to wireless communication? **(8)**

b) What is mobile agent? What are the different requirements for mobile agent systems? **(8)**

Q6 a) Describe the function of MS and SIM. Why does GSM separate MS and SIM? How and where is user related data stored? **(8)**

b) Explain the functions of GPRS protocol stack with a neat diagram. **(8)**