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

Total Number of Pages : 02 **M.Tech**
P2CTCC01

2nd Semester Regular / Back Examination: 2021-22
COMPUTER GRAPHICS
BRANCH(S): COMPUTER SCIENCE AND ENGG.
Time : 3 Hour
Max Marks : 100
Q.Code : J419

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 × 10)**

a) Discuss self-similar and self-affine fractals
b) What are the properties of a convex polygone?
c) Derive the general form of scaling matrix about a fixed point (x_f, y_f)
d) What is the difference between DDA and Bresenham's Line drawing algorithm?
e) Define refresh/frame buffer
f) What is isometric projection?
g) Write down the conditions for point clipping in window
h) Consider a raster system with resolution of 640 by 524. What is the size of frame buffer to store 12 bits per pixel in bytes?
i) What is the difference between Cartesian coordinate and HCS.?
j) What is Ray tracing methods?

Part-II

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

a) Using Brsenham's circle drawing algorithm plot one quadrant of a circle of radius 7 pixels with origin as center
b) Draw a line (22, 10), (32, 18) by using Bresenham's line drawing algorithms
c) Find the transformation matrix for the reflection about the line Y=X
d) Find the matrix that represents the rotation of an object by 45^o about origin. What are the new co-ordinates of the point P (2, -4) after rotation?
e) Explain between raster scan and random display
f) Describe Gouraud Shading algorithm with its advantages and disadvantages
g) Explain Sutherland-Hodgeman algorithm for polygon clipping
h) What is morphing? Explain in detail about morphing with an example
i) What are the advantages of B-spline over Bezier curves?
j) What is meant by continuous tone, half-tone and bi-tone images?
k) Find the pixel positions for the octant from x = 0 to x = y of a circle centered at (3,0) with radius 16 using the midpoint circle algorithm
l) Write 3-D composite transformation matrix using homogenous coordinates to scale a line AB with A(10, 15, 20) and B(45, 60, 30) by 2.5 in z-direction while keeping point A fixed

Part-III

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

Q3 A rectangle ABCD whose coordinates are A(1,1),B(4,1),C(4,4),D(1,4) and the window coordinates are (2,2),(5,2),(5,5),(2,5) and the given viewport location is (0.5,0),(1,0),(1,0.5),(0.5,0.5).Calculate the viewing transformation matrix **(16)**

Q4 Given a window A(10,10) ,B(70,50), C(60,40),D(30,50). Use Cohen Sutherland algorithm to find the visible portion of the line P(40,80), Q(120,30) inside the window **(16)**

Q5 Explain about composite transformation in general and explain the following with matrix representations: **(16)**

- **i.** Two successive translations
- **ii.** Two successive rotations
- **iii.** Two successive scaling
- **iv.** General pivot point rotation
- **v.** General fixed point scaling

Q6 Write short notes (Any Two) **(16)**

- **i.** Painters algorithm
- **ii.** Shear Transformation
- **iii.** Principle of computer animation

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P2CTCC02

2nd Semester Regular / Back Examination: 2021-22
SOFTWARE ENGINEERING
BRANCH(S): COMPUTER SCIENCE AND ENGG.
Time: 3 Hour
Max Marks: 100
Q.Code : J499

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 × 10)**

a) What is the advantage of adhering to life cycle models for software?
b) What are the various categories of software?
c) List the task regions in the Spiral model.
d) If you have to develop a word processing software product, what process models will you choose? Justify your answer
e) Distinguish between verification and validation.
f) List the characteristics of good SRS.
g) What are the different types of Cohesion?
h) What is regression testing?
i) Distinguish between alpha and beta testing.
j) What are the types of software maintenance?

Part-II

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

a) Discuss types of code reviews. Explain when and how code review meetings are conducted. Why code review is considered to be a more efficient way to remove errors from code compared to testing?
b) What are driver and stub modules in the context of integration and unit testing of a software product? Why are stub and driver modules required?
c) List five silent requirements that a software development organization must comply with before it can be awarded ISO 9001 certification.
d) What is statistically testing? In what way is it useful during software development? Explain in the different steps of statistical testing.
e) Schematically draw the architecture of a CASE environment and explain how the different tools are integrated.
f) What do you mean by the term software reverse engineering? Why is it required? Explain the different activities undertaken during reverse engineering.
g) Define debugging? Explain various approaches debugging techniques.
h) What is the significance of McCabe's Cyclomatic Complexity Metric?
i) What are the important types of risks that a project might suffer from? How would identify the risks that a project is susceptible to during project planning stage?

j) What is Coupling? What are the various types of coupling?

k) What do you mean by balancing a DFD? Illustrate your answer with a suitable example.

l) What do you mean by the "99% complete" syndrome in software development? Why does it occur? What is its implication for project management? What are its remedies?

Part-III

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

Q3 What are all the formulas for cyclomatic complexity? Calculate cyclomatic complexity for greatest of three numbers? **(16)**

Q4 State the advantages of function point over Lines of Code (LOC). List all the value adjustment factors. What are the metric for specification quality? **(16)**

Consider a project with

No. of user input=50
No. of output =40
No. of Enquiries = 35
No. of user files= 06
No. of external interface =04

All CAF and weighting factor are average. Compute function point.

Q5 What are the different models of a problem that can be constructed using UML. Explain the following in context to UML. **(16)**

A) Use Case Diagram
B) Sequence Diagram
C) State Diagram
D) Classes and Objects

Q6 **Explain the following:** **(16)**

(i) waterfall model **(ii)** Spiral model **(iii)** RAD model **(iv)** Prototyping model.

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P2CTCC07

2nd Semester Regular / Back Examination: 2021-22
DATA WARE HOUSING & DATA MINING
BRANCH(S): COMPUTER SCIENCE & ENGG.
Time : 3 Hour
Max Marks : 100
Q.Code : J565

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 ×10)**

a) What is SMP implementation Explain briefly.
b) Define Client /Server Computing Model & Data Warehouse
c) Explain data verses Metadata
d) Differentiate between Discovery verses Prediction
e) Define Kohonen feature map
f) Difference between CART and CHAID
g) What is the use of Cleanup & transformation Tools
h) Write short notes on Algorithm Score card
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 × 8)**

a) What is a classification problem? What are the disadvantages of the decision tree over other classification techniques?
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, 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)

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 50%. **(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	Sunny	Hot	High	Weak	No
Day2	Sunny	Hot	High	Strong	No
Day3	Overcast	Hot	High	Weak	Yes
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	5.5
February	110	5.8
March	112	6
April	115	5.9
May	117	6.2
June	116	6.3
July	118	6.5
August	120	6.6
September	121	6.4
October	120	6.5
November	117	6.7
December	123	6.8

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P2CTCC12

2nd Semester Regular Examination: 2021-22
WIRELESS SENSOR NETWORK
BRANCH(S): COMPUTER SCIENCE AND ENGG, ELECTRO & COMM. ENGG
Time : 3 Hour
Max Marks : 100
Q.Code : J745

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 × 10)**

a) What is Data-Centric Network?
b) What is the wavelength of a signal with a frequency of 150 Mhz?
c) Suggest a few metrics that can be associated with battery-aware routing techniques.
d) Write three basic physical mechanisms affect radio propagation.
e) Explain the differences between proactive routing protocols and Reactive routing protocols.
f) What is Data Aggregation?
g) What is multicasting?
h) List any four applications of Sensor networks.
i) Write down the challenges in designing a Sensor Network.
j) What networking structure do the 802.11 standards define?

Part-II

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

a) Express different methods of data aggregation in WSN.
b) What are the different types of mobility we have in WSN.
c) What is range-based localization? Explain with an example how triangulation works.
d) What are the advantages of reservation-based MAC protocols over contention based MAC protocols?
e) What is localization and what is the advantage of localization?
f) List various various congestion control mechanism.
g) Explain Zone Routing-protocol (ZRP).
h) Elaborate on the energy scavenging techniques for sensor nodes.
i) Discuss in detail about routing protocols with efficient flooding mechanisms.
j) What is on-demand QOS routing protocol? Explain.
k) Compare deterministic and random deployment in WSN.
l) Explain AoDV routing protocol in detail with an example.

Part-III

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

Q3		Explain protocol stack of wireless sensor network.	**(16)**
Q4		Explain WSN Design Issues for MAC protocols, Routing protocols and Transport protocols in detail.	**(16)**
Q5		Discuss about the Lifetime maximizing energy-aware routing techniques.	**(16)**
Q6	**a)**	Write notes on Dynamic Energy and power management.	**(8)**
	b)	What is QoS? Discuss QoS in Wireless Sensor Networks.	**(8)**

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P2PUCC10

2nd Semester Regular Examination: 2021-22
PRODUCTION MANAGEMENT
BRANCH(S): MECH. ENGG., PRODUCTION ENGG.
Time : 3 Hour
Max Marks : 100
Q.Code : J763

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 × 10)**

a) Define Tardiness (Tj).
b) Write down the factors influencing plant location.
c) Differentiate between process layout and product layout.
d) Draw diagram of product life cycle and mention all the stages.
e) What is cellular manufacturing layout?
f) Is exponential smoothing a form of weighted average? How?
g) What are Gantt charts?
h) What are the costs considered in the transportation model for aggregate planning?
i) Define break-even point.
j) Define work study and method study.

Part-II

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

a) Explain the Importance of Aggregate Planning and Capacity Planning. List the Difference between them.
b) What are the assumptions of the basic EOQ Model? Distinguish between a Fixed order- quantity system and fixed-time-period system.
c) Write basic issues and tools of managing production.
d) Explain the strategies and guidelines of Aggregate planning. Describe the Functions of Master Production Scheduling.
e) Describes the steps involved in product design and explain the stages of product life cycle with neat sketch.
f) Explain in details about the type of inventory. Write down the reasons for keeping inventories.
g) What is planning and examine the importance of planning and control in Manufacturing sector.
h) Describes the different types of production process with suitable examples along with their advantages and limitations.
i) Describe different analytical methods in production systems.

j) What is the least square method of forecasting?
Sales for over the last 5 weeks are shown below:
Week: 1 2 3 4 5
Sales: 150 157 162 166 177
Determine the equation of the trend line. Predict sales for weeks 6 and 7.

k) Explain about Line Balancing with suitable examples.

l) Discuss the steps of Delphi Method.

Part-III

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

Q3 "Production management is process of planning, organizing and controlling the activities of production function". Explain. Discuss the scope and objectives of production management. **(16)**

Q4 What is plant layout of physical facilities? State the objectives of good plant layout. **(16)**
Compare product layout and process layout with suitable examples.

Q5 Describe the variables and the strategies associated with aggregate planning. **(16)**
The lead time to procure the raw material from a supplier is 4 weeks. The present stock is 54 kg of the material. There is also a scheduled receipt of 4.5 kg of it in 4 weeks. On order quantity is 45 kg, find the planned order releases. The production requirements over the period of next 9 weeks are as follows:

Week	1	2	3	4	5	6	7	8	9
Amount required (kg)	24	--	29	11	--	5	19	27	18

Q6 Given the data for seven periods are 92, 93, 92, 91, 93, 94, 92. Find the forecast for the eighth period using simple exponential smoothing? Use α = 0.2 α = 0.7 and initial forecast using simple average? Explain the effect of α on the contribution of the data for the various periods. **(16)**

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P2CTCC03

2nd Semester Regular / Back Examination: 2021-22
DISTRIBUTED DATABASE SYSTEM
BRANCH(S): COMPUTER SCIENCE AND ENGG.
Time : 3 Hour
Max Marks : 100
Q.Code : J645

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 × 10)**

a) How do you define a distributed db system?
b) Name 5 characteristics of a DDBMS
c) Are there different types of distributed databases? If yes, then which ones have you worked with?
d) Does sharding make sense when designing a distributed database?
e) How can you implement ACID compliance in a distributed database?
f) What's your understanding of consistency in the context of distributed databases?
g) What is a load balancer? What is its role in a distributed database?
h) What is horizontal scaling? Why is it important in the context of distributed databases?
i) What are the major differences between a cloud-based database and an on-premise distributed database?
j) Name 2 MPMD DDBMS types.

Part-II

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

a) Explain the Design issues of Distributed Database.
b) Define the Transaction management model for distributed System.
c) Explain briefly about heterogeneous distributed database.
d) What are the objectives of Distributed Query Processing?
e) Explain the basic Timestamp Ordering Algorithm.
f) Explain the phases of query processing in distributed database.
g) What do you mean by semi join in distributed db?
h) Name some concepts and mechanisms that are necessary to govern transaction transparency.
i) Define two-phase commit protocol.
j) What does Data Fragmentation refer to?
k) Name 3 levels of DDBMS data and process distribution.
l) What is a NoSQL database? Do they fall under the umbrella of distributed databases?

Part-III

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

Q3 What are the various kinds of transparencies in distributed database design? Explain each with the help of example. **(16)**

Q4 What are the various concurrency control techniques? Compare Lock based Concurrency Control strategies in detail. **(16)**

Q5 Compare Distributed Deadlock prevention to Distributed Deadlock Avoidance. Explain one scheme of Distributed deadlock Detection and Recovery. **(16)**

Q6 What problem can occur in a distributed system due to the failure of link and partitioning of the network? What are the ways by which recovery can take place? **(16)**

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P2CTCC11

2nd Semester Regular / Back Examination: 2021-22
MOBILE COMPUTING
BRANCH(S): COMPUTER SCIENCE AND ENGG
Time : 3 Hour
Max Marks : 100
Q.Code : J711

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 ×10)**

a) What is a SIM and what does it store?
b) What is the structure of MSRN number and who creates this number in GSM network?
c) What are the functions of a BTS present in the GSM network?
d) What are the functions of a BSC present in the GSM network?
e) What are the functions of an MSC present in the GSM network?
f) What is HLR and what are its functions in GSM network?
g) What is VLR and what are its functions in GSM network?
h) What do you mean by IBSS in IEEE 802.11 wireless LAN?
i) What is the format of RTS frame used in IEEE 802.11 wireless LAN?
j) What is the format of CTS frame used in IEEE 802.11 wireless LAN?

Part-II

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

a) Explain the different channel assignment policies used in wireless cellular network.
b) Explain the steps followed to locate a receiver in GSM network.
c) Explain the steps followed to originate a call in GSM network.
d) Write the signal flow during the Intra-MSC handover.
e) Explain the purpose of Broadcast channels used in GSM.
f) Explain the subscriber authentication procedure used in GSM network.
g) Explain data encryption mechanism used in GSM network.
h) Explain the architecture of an infrastructure-based IEEE 802.11 wireless LAN with suitable example.
i) Write the protocol stack considering an IEEE 802.11 wireless LAN connected to a switched IEEE 802.3 Ethernet via a bridge.
j) Explain the structure of IEEE 802.11 PHY frame using FHSS.
k) Explain IP packet delivery to and from the mobile node in Mobile IP.
l) Explain the working of Indirect TCP (I-TCP).

Part-III

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

Q3 Describe the working of the basic CSMA/CA protocol. Further explain how with RTS/CTS extensions it resolves exposed/hidden terminal problems. **(16)**

Q4 Write the functional architecture of a GSM network. Further write the protocol stack used for signaling in GSM network and explain the functions of Call Management (CM) and Mobility Management (MM) layers. **(16)**

Q5 Write the IEEE 802.11 WLAN MAC data frame format and explain each of its fields and subfields in detail. **(16)**

Q6 Explain how power management is done in IEEE 802.11 Ad Hoc Networks. **(16)**