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B.Tech. (CSE) 3rd Semester (G-Scheme)
Examination, December–2025
DATABASE MANAGEMENT SYSTEMS
Paper–PCC-CSE-201-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Students have to attempt **five** questions in total, **first being compulsory** and selecting **one** from each unit.*

1. Short Note on:- 5×3=15

   (a) Different type of attributes.

   (b) Foreign key & its use

   (c) Data Abstraction

   (d) Type of join in SQL

   (e) SQL Injection

Unit-I

2. (a) Define DBMS & explain its purpose & functions. 5

   (b) What are advantages of using a DBMS compared to a file based system. 10

3. (a) Explain different type of data models. 8

   (b) Explain Relational algebra in DBMS. 7

Unit-II

4. (a) What is Normalization? Why is it important? Explain different forms. 10

   (b) Explain all the functional dependencies with examples. 5

5. Explain query optimization and what are the measures of Query cost. 15

Unit-III

6. (a) Explain concept of concurrency control in DBMS. 10

   (b) What are ACID properties? 5

7. (a) Explain Time stamp protocol. 8

   (b) Difference between B and B+ tree. 7

Unit-IV

8. (a) Explain the access control method in DBMS. 7

   (b) Explain the concept of data Ware house and data Mining. 8

9. (a) Explain the Intrusion detection system with different types. 8

   (b) Explain the logical database and web database. 7

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B.Tech. (CIVIL ENGG.) 3rd Semester (G-Scheme) Examination, December–2025

ECONOMICS FOR ENGINEERS

Paper– HSMC-01-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all, selecting **one** question from each unit. **Question No. 1 is compulsory** All Questions carry equal marks.*

1. (a) Explain the role of Engineering Economics.

(b) State the Law of Supply.

(c) Explain the meaning of Privatization.

(d) What are the merits of Globalization?

(e) Explain the features of Monopolistic competition.

(f) What is Fixed cost and Variable cost? $6 \times 2.5 = 15$

Unit-I

2. What do you understand by production possibility curve? Discuss its implications and uses. 15

3. State and explain the meaning and degrees of elasticity of demand. 15

Unit-II

4. Explain various Internal Economies and external Economies. What is their impact on a firm. 15

5. Bring out the relationship between Average cost and Marginal cost in the short Run. 15

Unit-III

6. Explain the meaning and features of monopolistic competition. State the difference between monopoly and monopolistic competition. 15

7. Explain the concept of elasticity of supply and describe the factors that affect elasticity of supply. 15

Unit-IV

8. What features of the Indian Economy have been responsible for its slow growth? 15

9. Discuss the progress of Privatization in India since 1991. 15

B.Tech. (CSE) 3rd Semester (G-Scheme)
Examination, December–2025
DIGITAL ELECTRONICS
Paper– PCC-CSE-205-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt* ***five*** *questions in all, selecting* **one** *question from each Unit.* ***Question no. 1 is*** **compulsory.** *All questions carry equal marks.*

1. (a) What do you mean by Digital signal? 6×2.5=15
   (b) Define various applications of shift register.
   (c) What do you mean by demultiplexer?
   (d) Define RAM.
   (e) Define CAM.
   (f) Define Comparator.

Unit-I

2. Solve the following: 15
   (a) Convert $(734)_8$ into $(\ )_{16}$
   (b) Convert $(AB43)_{16}$ into $()_8$
   (c) Convert $(4634)_{16}$ into $()_{10}$
   (d) Convert $(264)_{10}$ into $(\ )_2$
   (e) Convert $(1110l)_2$ into $()_{10}$

3. Explain various Error detecting and correcting codes in detail. 15

Unit-II

4. Realize a function with the help of NAND gates:

   $F(A, B, C, D) = \Sigma (0, 2, 3, 4, 6, 15) + d(1, 9, 12)$

5. Write short note on:

   (a) Multiplexer

   (b) Priority encoder

Unit-III

6. Explain the working of S-R flip flop with truth table.

7. Explain different types of shift registers.

Unit-IV

8. Explain various types of analog to digital converters in detail.

9. Explain the following:

   (a) PLA

   (b) CPLD

B.Tech. (CSE) 3rd Semester (G-Scheme)
Examination, December–2025

MATHEMATICS-III

Paper– BSC-Math-203-G

Multivariable Calculus And Differential Equations

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in all, by selecting one question from each unit. **Question Number 1 is compulsory**. All questions carry equal marks.*

1. (a) Define continuity for function of two variables.

(b) If $u = xe^{y}z$, $y = \sqrt{a^2 - x^2}$, $z = \sin^2 x$, then find $\frac{du}{dx}$

(c) Evaluate $\int_0^1 \int_o^{\sqrt{1+x^2}} y \, dy \, dx$

(d) Solve $(2x^3y - 3x^2y^2 - 5y^4)\, dy + (5x^4 + 3x^2y^2 - 2xy^3)\, dx = 0$

(e) Find I. F. for $(3x^2y - x^3)\, dy - (x^2y - 2xy^2)\, dx = 0$

(f) Solve $(D^3 - 4D^2 + 4D)\, y = 0$, where $D = \frac{d}{dt}$.

Unit-I

2. (a) Discuss the continuity of $f(x, y) = x + y$ at $\left(\frac{1}{2}, \frac{1}{3}\right)$

(b) If $u = \tan^{-1}\left(\frac{x^3+y^2}{x-y}\right)$ then prove that

$$x^2\frac{\partial^2 u}{\partial x^2} + y^2\frac{\partial^2 u}{\partial y^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} = 2\text{Cos } 3u \sin u$$

3. (a) Discuss the maxima and minima of $x^3y^2(1-x-y)$.

(b) Given $x + y + z = a$, find maximum value of $x^m y^n z^p$.

Unit-II

4. (a) Evaluate $\int_0^1 \int_0^1 \frac{1}{\sqrt{(1-x^2)(1-y^2)}}\, dx\, dy$ 15

(b) By changing the order evaluate $\int_0^a \int_{y^2/a}^{y} \frac{y}{(a-x)\sqrt{ax-y^2}}\, dx\, dy$.

5. (a) Evaluate $\iiint_R (x^2+y^2+z^2)\, dxdydz$, where R denote the region bounded by $x = 0$, $y = 0$, $z = 0$ and $x + y + z = a$, $(a > 0)$.

(b) By double integral, find the area lying inside the circle $r = a \text{ Sin } \theta$ and outside the cardioid $r = a(1 - \cos\theta)$

Unit-III

6. (a) Solve $(xy^2 + 2x^2y^3)\, dx + (x^2y - x^3y^2)\, dy = 0$

(b) The equation of electromotive force in terms of current i for an electrical circuit having resistance R and a condenser of capacity C, in series is given as $E = Ri + \int \frac{i}{c} dt$. Find the current i at any time t. When $E = E_o \text{ Sin}\omega t$.

7. (a) A body cools from 100°C to 60°C in 20 minutes in a room of temperature 20°C, where temperature of outside air is 10°C. In what time will the temperature of body drop to 30°C.

(b) Show that the family of parabolas $x^2 = 4a(y + a)$ is self-orthogonal. 15

Unit-IV

8. (a) Solve $(D^2 - 4)\, y = x \text{ Sin } hx$

(b) By method of variation of parameters Solve $(D^2 - 1)y = e^{-x} \sin(e^{-x}) + \cos(e^{-x})$.

9. (a) Solve $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = \log x \sin(\log x)$.

(b) Solve the following simultaneous equations:

$$\frac{dx}{dt} = 2y, \frac{dy}{dt} = 2z, \frac{dz}{dt} = 2x$$

B.Tech. (CSE) 3rd Semester (G-Scheme)
Examination, December–2025
DATA STRUCTURES & ALGORITHMS
(w.e.f. March-2021)
Paper– PCC-CSE-203-G(A)

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all, selecting **one** question from each unit. **Question No.1 is compulsory.** All questions carry equal marks.*

1. (a) Define Data Structure. 15×1=15

(b) What is Big-O notation?

(c) What are the advantages of the array over a linked list?

(d) Why Stack is a recursive data structure?

(e) How do you test for empty Queues in 'C'?

(f) How does bubble sort get its name?

(g) Write applications of a doubly linked list.

(h) What is the need for a header in the header-linked list?

(i) What do you mean by external and internal sorting?

(j) What is an almost complete binary tree?

(k) What is a balance factor in the AVL tree?

(l) What is the use of Kruskal's algorithm?

(m) What is visiting and traversing in a graph?

(n) What are the characteristics of an algorithm?

(o) How priority queues are represented in 'C'?

Unit-I

2. What steps should be followed while selecting a data structure to solve a problem? Justify your answer with the help of an example. 15

3. (a) Explain why the complexity of Binary Search is O(log n). 7

(b) Write a program for Recursive Binary Search. 8

Unit-II

4. (a) Why and when Stack or Queue data structure should be used instead of Array or lists 7

(b) Convert the following infix expression into prefix expression by using Stack: 8

((A / B) + C) - (D + (E * F))

5. (a) Define Queues in the data structure. What are the different types of Queues in the data structure? 4

(b) What are the basic operation on Queues in data structure? 4

(c) How Queues can be implemented in 'C'. 4

(d) What are the application of Queues in the data structure? 3

Unit-III

6. Write algorithm for:

(a) Deleting the linked list node following a given node. 7

(b) Deleting the linked list node with a given ITEM of information. 8

7. (a) Define Binary Search Tree. What are the major differences between a Tree and a Binary Tree? 6

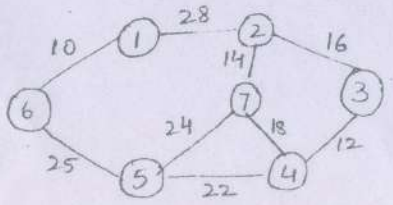
(b) Construct a Binary Search Tree for the following: 9

52, 17, 60, 5, 20, 58, 91, 3, 8, 37, 59, 24

Unit-IV

8. Write an algorithm for Merge Sort. 15

9. How does Prim's algorithm work? Construct the Minimum Spanning Tree for the given graph using Prim's algorithm. 15



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B.Tech. (CSE) 3rd Semester (G-Scheme)
Examination, December–2025

PYTHON PROGRAMMING (w.e.f. March-2021)
Paper– PCC-CSE-207-G (A)

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all, selecting **one** question from each unit. **Question No. 1 is compulsory.***

1. Write short note on following: 15

   (i) Syntax of Python

   (ii) Text files

   (iii) Dictionary

   (iv) Attributes

   (v) RGB scheme

   (vi) Image Properties

Unit-I

2. Explain the following: 15

   (i) Interactive shell

   (ii) Arithmetic operators and expressions

3. Describe the following: 15

(i) Slicing a string

(ii) How do you use text files in Python?

Unit-II

4. (i) Describe Sorting in Python with a suitable example.

(ii) What are the list operators in Python? 15

5. Explain the following: 15

(i) Recursion function

(ii) Python Program Design

Unit-III

6. (i) Which Python module is used for image Processing? Explain in detail.

(ii) Give a brief description about Image blurring. 15

7. Explain the following: 15

(i) Components of Python Window

(ii) GUI modules in Python

Unit-IV

8. Describe Exception and Exception Handling in detail. 15

9. Explain the following: 15

(i) The Readers and Writers Problem

(ii) Synchronization