CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination	:	B.Tech III Sem Regular & Supplementary Examinations December-2024
Course Name	:	Software Engineering
Course Code	:	A405308
Branch	:	CSE & CSM
Date & Session	:	19-12-2024 AN Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries ONE mark.   **10x1=10M**

1.	Define software.	1 M
2.	What is process pattern?	1 M
3.	What is requirements management?	1 M
4.	What is SRS?	1 M
5.	Define Coupling.	1 M
6.	What is a Sequence diagram?	1 M
7.	Define Beta Testing.	1 M
8.	What is software metric?	1 M
9.	Write about software risks?	1 M
10.	What is quality management?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A).	Describe "Software myth"? Discuss on various types of software.	10M
	OR	
11. B).	i) Explain the steps in Agile SDLC Model.	7M
	ii) Describe the evolving role of software.	3M
12. A).	Explain in detail about the software requirements specification with SRD and SRE.	10M
	OR	
12. B).	i) Explain the requirement validation techniques.	5M
	ii) What is requirement engineering? What are the problems with user requirements?	5M
13. A).	What is an architecture style? Explain its categories.	10M
	OR	
13. B).	i) Define software design. How is the quality of the design assessed.	6M
	ii) What is use case? Explain with an example how sequence diagram give more detail for the use case.	4M
14. A).	i) Compare validation testing and system testing.	5M
	ii) Explain black box and white box testing process completely.	5M
	OR	
14. B).	Explain the process of debugging with a neat diagram.	10M

(P.T.O.)

15. A).   i) Write about six sigma quality standards for software engineering.   5M
           ii) Explain about risk identification.   5M

<div align="center">**OR**</div>

15. B).   i) Explain Formal technical review in detail.   5M
           ii) Discuss briefly about Pro-active and Re-active Risk strategies in detail.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	B.Tech III Sem Regular & Supplementary Examinations December-2024	
Course Name	:	Digital Electronics	
Course Code	:	A404204	
Branch	:	CSE & CSC	
Date & Session	:	21-12-2024 AN	Duration: 3 hours	Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   **10x1=10M**

1. State and Prove De Morgan's Theorem.   1 M
2. Find the duals of following Boolean identities   1 M
   A+B).(B+C).(C+D) ii) A(B+C)+B.(C+A)+C.(A+B)
3. Define K-map? List out advantages and disadvantages?   1 M
4. Simplify $F(x,y,z)= \sum_m(0,1,2,4,6)$ using K-map   1 M
5. Define Magnitude comparator and draw the block diagram?   1 M
6. What is Combinational circuit? give examples   1 M
7. Draw the block diagram of sequential circuit   1 M
8. What are the differences between Synchronous counter and Asynchronous counter? 1 M
9. What is meant by a State table?   1 M
10. What is meant by Race free state assignment Hazard?   1 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). i) Convert $(105.15)_{10}$ to binary and octal.   5M
        ii) Reduce the expression F=A[B+C'(AB+AC')']   5M

OR

11. B). i) Convert the given octal number $(2564.603)_8$ to hexadecimal number and explain   5M
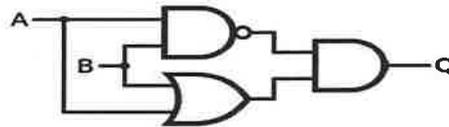   process of conversion.

fig 1

ii) Obtain the output Boolean expression (Q) and truth table of the circuit shown in fig1.   5M

12. A). Find the following Boolean expression using K-map and implement with universal gates   10M
         $F=\sum_m(0,2,6,10,11,12,13)+d(3,4,14,15)$

OR

12. B). Evaluate the following Boolean expression using Boolean Algebra and draw the logic   10M
         diagram.
         i) $T(X, Y, Z) = (X+Y)(X(Y+Z))+XY+XZ$
         ii) F= xyz+x'y+xyz'

(P.T.O..)

13. A). Design a combinational circuit with three inputs and one output, whose output is equal to logic 1 when the decimal value of the input is less than 3?   10M

<div align="center">OR</div>

13. B). i) Implement a Full adder using two half adders and OR gate.   5M
ii) Design a 4-bit gray code to binary code.   5M

14. A). i) Explain how SR-Flip-flop is converted into D-Flip flop.   5M
ii) What is Shift register? Draw and explain the working of 4-bit Serial-in, Serial-out shift register   5M

<div align="center">**OR**</div>

14. B). i) Write the differences between Combinational logic circuit and sequential logic circuit.   3M
ii) Design and explain a 4-bit ring counter using D-flip flops with relevant timing diagrams.   7M

15. A). i) Write the differences between SRAM and DRAM.   5M
ii) Implement the following function using a PAL.   5M

$F (A, B, C, D) = \Sigma m (1, 9, 12, 15)$

<div align="center">**OR**</div>

15. B). i) Explain in detail about classification of memories.   5M
ii) Design 3 bit binary to Gray Code converter using PLA.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	B.Tech III Sem Regular & Supplementary Examinations December-2024
Course Name	:	Database Management Systems
Course Code	:	A405304
Branch	:	CSE/ CSC/ CSD
Date & Session	:	30-12-2024 AN

Duration: 3 hours   Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1. List the purpose of Database Management System.   1 M
2. List the Database Languages.   1 M
3. What is the difference between Super key and Candidate key?   1 M
4. What is Domain relational calculus?   1 M
5. List the aggregate functions supported by SQL.   1 M
6. Define Multivalued Dependency.   1 M
7. Define transaction.   1 M
8. List the phases of two-phase locking protocol.   1 M
9. What are ordered indices? Give an example.   1 M
10. Differentiate between fixed length record and variable length records.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) What is Data Abstraction? Explain about different views of data.   5M
　　　 ii) Define Instance and Schema. List different data models and explain.   5M

OR

11. B). Consider a database used to record the marks that students get in different exams of different course offering. Construct an E-R diagram that model exams as entities and uses a ternary relationship for the database.   10M

12. A). What is an Integrity Constraint? Discuss about Integrity Constraints enforcement over relations.   10M

OR

12. B). Consider the employee database, Give an expression in Relational Algebra for each of the following queries.   10M
Employee (employee-name, street, city)
Works (employee-name, company-name, salary)
Company (company-name, city)
Manages (employee-name, manager-name)
i) Find the names of all employees who work for First Bank Corporation.
ii) Find the names and cities of residence of all employees who work for First Bank Corporation.
iii) Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum.
iv) Find the names of all employees in this database who live in the same city as the company for which they work.

(P.T.O..)

13. A). Consider the following database and write SQL Queries for each of the following queries.   10M
Sailors(sid: integer, sname: string, rating: integer, age: real)
Boats(bid: integer, bname: string, color: string)
Reserves(sid: integer, bid: integer, day: date)
i) Find the colors of boats reserved by Lubber.
ii) Find the sids of sailors with age over 20 who have not reserved a red boat.
iii) Find the names of sailors who have reserved all boats.
iv) Find the names of sailors who have reserved at least two boats.

OR

13. B). Consider a relation R with four attributes ABCD and Functional Dependency set is   10M
$\{A \rightarrow B, B \rightarrow C, C \rightarrow D\}$.

(i) Find the candidate key(s) for R. (ii) find the best normal form that R satisfies (iii) If R is not in BCNF, decompose it into a set of BCNF relations?

14. A). Explain log based recovery with immediate update and deferred update with suitable   10M
examples.

OR

14. B). i) What is concurrency control? How is it implemented in DBMS?   5M
ii) Discuss the violations caused by each of the following: dirty read, non-repeatable read   5M
and phantoms with suitable example.

15. A). Discuss about hash based indexing and tree based indexing with their data structures and   10M
indices.

OR

15. B). Create a B Tree by insert the following key elements (order of the tree is 3) 5, 3, 4, 9, 7,   10M
15, 14, 21, 22, 23. Then delete the keys 4, 9 and 21, give the resulting tree.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	B.Tech III Sem Supplementary Examinations Dec-2024/ Jan-2025	
Course Name	:	Basic Electrical Engineering	
Course Code	:	A402201S	
Branch	:	CSE/ CSD/ CSC	
Date & Session	:	17-01-2025 FN Duration: 3 hours	Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1.	State Kirchhoff's voltage law.	1 M
2.	State the Super position theorem.	1 M
3.	What are the voltage relations in star and delta connections of three phase balanced AC circuits?	1 M
4.	What is RMS value in AC circuits?	1 M
5.	What is the function of Auto transformer?	1 M
6.	Define the term efficiency of a transformer.	1 M
7.	State the basic parts of a DC machine.	1 M
8.	Write the working principle of a synchronous generator.	1 M
9.	What is MCCB?	1 M
10.	What is ELCB?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	State and explain the thevenin's theorem.	10M
	OR	
11. B).	Explain the i) Voltage and current sources ii) Kirchhoff's current law.	10M
12. A).	A choking coil of 10 ohm resistance and 0.1H inductance connected in series with a capacitor of 200 micro farads. Calculate the current, the coil voltage, the capacitor voltage. The supply voltage is 230V at 50 HZ?	10M
	OR	
12. B).	Explain the following terms i) Real and Reactive power ii) Apparent power and power factor.	10M
13. A).	Discuss the various three phase transformer connections.	10M
	OR	
13. B).	Explain the losses and equivalent circuit of a transformer.	10M
14. A).	Explain the performance characteristics of DC shunt machine.	10M
	OR	
14. B).	Explain the construction and working of a three phase Induction motor.	10M
15. A).	What are the types of wires and cables? Explain.	10M
	OR	
15. B).	Discuss the power factor improvement and battery backup of Electrical installations.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	**B.Tech III Sem Regular & Supplementary Examinations December-2024**
Course Name	:	**Discrete Mathematics**
Course Code	:	**A405306**
Branch	:	**CSC**
Date & Session	:	**19-12-2024 AN** Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1.	Construct Truth Table for $p \Leftrightarrow q$	1 M
2.	Write the symbolic form of Implication, "If it rains today then, I will stay at home".	1 M
3.	Find equivalence relation with an example.	1 M
4.	Define Injective (one to one) function.	1 M
5.	Define a semi group.	1 M
6.	Define a subgroup of group.	1 M
7.	In how many ways can we arranged the word "APPLE".	1 M
8.	Find the 2-combinations from $\{a, b, c\}$	1 M
9.	Define Chromatic Number.	1 M
10.	State Euler's formula for directed graph.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	i) Show that $R \vee S$ is a valid conclusion from the premises: $C \vee D, (C \vee D) \to \neg H, \neg H \to (A \wedge \neg B), and (A \wedge \neg B) \to R \vee S$	5M
	ii) Show that $[(p \vee q) \wedge (p \to r) \wedge (q \to r)] \to r = T$ (tautology) by using truth table.	5M

OR

11. B).	i) Prove or disprove the validity of the following arguments using the rules of Inference	5M
	All men are fallible,	
	All kings are men,	
	Therefore, all kings are fallible.	
	ii) Convert into required DNF $[P \to (Q \wedge R)] \wedge [\neg P \to (\neg Q \wedge \neg R)]$.	5M

12. A).	i) Define various types of binary relation with an example.	5M
	ii) If $A = \{1, 2, 3, 4\}, R = \{(x, y) : x > y\}$	5M
	a) Find the Matrix Relation which corresponds to R.	
	b) Find the digraph of R.	

OR

12. B).	Let $f : R \to R \& g : R \to R$ where R is the set of real numbers. Find fog, gof where $f(x) = x^2 - 2 \, and \, g(x) = x + 4.$ state whether these functions are injective, surjective and bijective?	10M

(P.T.O..)

13. A). Prove that the set $\{1,2,3,4,5,6\}$ forms an abelian group with respect to multiplication modulo 7. 10M

OR

13. B). Verify the Partial Ordering $\{(a,b)\mid a\ divides\ b\}$ on $\{1,2,4,8\}$ is Lattice or not? 10M

14. A). i) Find the coefficient of xyz^2 in the expansion of $(2x-y-z)^4$ 5M

ii) A software company requires 30 programmers to handle system programming jobs and 40 programmers for application programming. If the company appoints 55 programmers to carry out these jobs. 5M
How many of these perform jobs of both types?
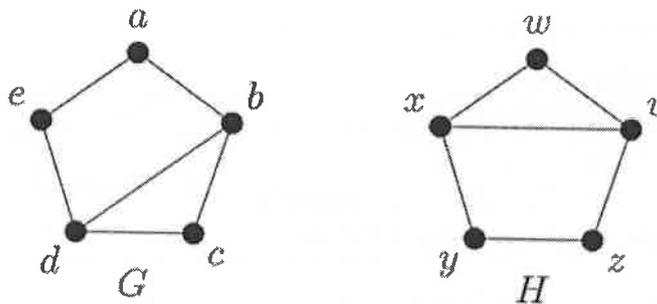How many Handles only system programming jobs?

OR

14. B). i) How many numbers form 1-1000 are there that are not divisible by any of the digits 2,3 and 5. 5M

ii) A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways this can be done when the committee consists 5M
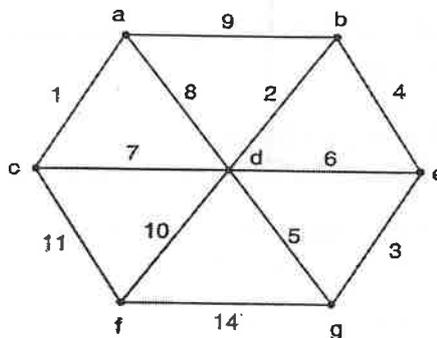   a) At least 3 girls
    b) At most 3 girls

15. A). Check whether graphs are isomorphic or not? 10M

OR

15. B). Using Kruskal's algorithm, find a minimal spanning tree for the weighted graph shown below. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	B.Tech III Sem Regular & Supplementary Examinations December-2024
Course Name	:	Computer Oriented Statistical Methods
Course Code	:	A400006
Branch	:	CSD & IT
Date & Session	:	19-12-2024 AN Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1. When do you say that the two events A and B are independent?   1 M
2. Give an example for mutually exclusive events.   1 M
3. Define mathematical expectation of a discrete random variable X.   1 M
4. What are the underlying conditions to obtain Poisson distribution?   1 M
5. List any two properties of normal distribution.   1 M
6. State Central Limit Theorem.   1 M
7. Define the standard error of sample mean.   1 M
8. Write the formula for testing single proportion.   1 M
9. Define Markov chain.   1 M
10. Write transition probability matrix.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). A, B, C are aiming to shoot a balloon. A will succeed 4 times out of 5 attempts. The   10M
chance of B to shoot the balloon is 3 out of 4 and that of C is 2 out of 3. If the three aim
the balloon simultaneously, then find the probability that at least two of them hit the
balloon.

OR

11. B). In a group consisting of equal number of men and women. It is noticed that 10% of the   10M
men and 45% of the women are unemployed. If a person is selected randomly from the
group then find the probability that the person is an employee.

12. A). If X is a Poisson variable such that $6P(X=4) = P(X=2) + 2P(X=0)$, find mean of the   10M
distribution and standard deviation. Also calculate $P(X < 2)$ and $P(1 < X < 4)$.

OR

12. B). The mean and variance of binomial distribution are 3 and 9/4. Find (i) the value of n   10M
(ii) $P(X > 7)$ (iii) $P(X > 10)$.

13. A). Derive mean and variance of Uniform distribution.   10M

OR

13. B). A population consists of elements 1, 3, 5, 7 and 9. Using without replacement technique 10M
(i) List all possible samples of size 2 (ii) Construct sampling distribution of means
(iii) Show that the sample mean is an unbiased estimator of the population mean.

(P.T.O..)

14. A). A big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers?   10M

OR

14. B). The mean life of a sample of 100 electric bulbs was found to be 1456 hours with standard deviation of 423 hours. A second sample of 170 bulbs chosen from a different batch showed a mean life of 1280 hours with standard deviation of 398 hours. Is there a significant between the mean life time of bulbs in two batches?   10M

15. A). Three boys A, B and C are throwing a ball to each other. A always throws the ball to B and B always throws the ball to C: but C is just as likely to throw the ball to B as to A. Show that the process is markovian. Find the transition matrix and classify the states. Do all the states are ergodic?   10M

OR

15. B). Given a two-state Markov chain with one-step transition probability matrix $P = \begin{bmatrix} (1-a) & a \\ b & (1-b) \end{bmatrix}$ $0 \leq a, b \leq 1,$ $|1-a-b| < 1$. Calculate n-step transition probabilities.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : B.Tech III Sem Regular & Supplementary Examinations December-2024
Course Name : Numerical Methods and Complex Variables
Course Code : A400007
Branch : EEE & ECE
Date & Session : 19-12-2024 AN   Duration: 3 hours   Max. Marks: 60

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1. Write Newton-Raphson method formula.   1 M
2. Show that $\Delta = E - 1$.   1 M
3. Write Simpson's 1/3 rd formula.   1 M
4. Write Runge-Kutta method of 4th order formula.   1 M
5. Define harmonic function.   1 M
6. State polar form of C-R equations.   1 M
7. Define Isolated singularity.   1 M
8. State cauchy's integral formula.   1 M
9. Define periodic function with an example.   1 M
10. Write Fourier Cosine Integral.   1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Find 4 iterations of $\cos x = xe^x$ using Regula-Falsi Method up to 4 decimal places.   5M
ii) Find y(2.4) using Newton's backward Interpolation formula from the following data: 5M

x	0	1	2	3
y	1	2	1	10

OR

11. B). A curve $y = f(x)$ passes through the points (0, 18), (1, 10), (3, -18) and (6, 90). Find the   10M
slope of the curve at $x = 2$ using Lagrange's Interpolation Formula.

12. A). Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using i) Trapezoidal rule taking h = ¼, ii) Simpson's 1/3rd rule   10M
taking h = ¼ and iii) Simpson's 3/8th rule taking h = 1/6.

OR

12. B). Solve the differential equation $\frac{dy}{dx} = 1 + \frac{2xy}{1+x^2}$, given y (0) = 0 using Runge-Kutta   10M
Method of order 4, and compute y (0.1) and y (0.2).

13. A). Find the real part of the analytic function whose imaginary part is $v(x,y) =$ 10M
$e^{-x}(2xycosy + (x^2 - y^2)siny)$.

OR

13. B). i) Find the bilinear transformation which maps the points (-1, 0,1) into the points (0, i, 3i).   6M
ii) Find the fixed point of the transformation w = $\frac{2i-6z}{iz-3}$ 4M

(P.T.O..)

14. A). Evaluate $\oint \dfrac{z+4}{z^2+2z+5} dz$ where c is the circle 10M

$|z+1+i| = 2$ ii) $|z+1-i| = 2$

OR

14. B). Find the residue of $f(z) = \dfrac{z^3}{(z-1)^4(z-2)(z-3)}$ at its poles and hence evaluate $\oint_C f(z)dz$ 10M

where C is the circle $|z| = 2.5$.

15. A). Obtain the half range fourier cosine series of $f(x) = x \sin x$ in $(0, \pi)$. Hence show that 10M

$\dfrac{1}{1.3} - \dfrac{1}{3.5} + \dfrac{1}{5.7} - \cdots \ldots \ldots \ldots \ldots \ldots \infty$ $terms = \dfrac{\pi-2}{4}$.

OR

15. B). Find the Fourier Cosine transform of $f(x) = \dfrac{1}{(1+x^2)}$. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	B.Tech III Sem Regular & Supplementary Examinations December-2024
Course Name	:	Computer Organization and Architecture
Course Code	:	A405307
Branch	:	CSM & CSD
Date & Session	:	21-12-2024 AN Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1.	Define computer organization, computer architecture.	1 M
2.	What is the purpose of arithmetic micro operations?	1 M
3.	List the functionalities of control unit.	1 M
4.	List the Data Transfer Instructions.	1 M
5.	What is floating point representation?	1 M
6.	What is 2's complement?	1 M
7.	Differentiate isolated I/O and memory mapped I/O.	1 M
8.	What is meant by auxiliary memory?	1 M
9.	What is cache coherence?	1 M
10.	What is parallel processing?	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	i) Draw the block diagram of a digital computer and explain the purpose of each part.	5M
	ii) Discuss about shift micro operations in detail.	5M

OR

11. B).	i) Explain in detail about instruction life cycle.	5M
	ii) What are computer registers? Explain.	5M

12. A).	Explain in detail various types of addressing modes with examples.	10M

OR

12. B).	Explain about instruction formats and general register organization.	10M

13. A).	Explain addition and subtraction of floating point numbers with an example and necessary flowchart.	10M

OR

13. B).	i) Explain in brief fixed point data representation.	5M
	ii) Explain the Booth's algorithm for signed multiplication.	5M

14. A).	i) Draw the block diagram of a typical DMA controller and explain.	5M
	ii) Explain about associative memory.	5M

OR

14. B).	i) Explain asynchronous data transfer.	5M
	ii) Compare cache and main memory.	5M

(P.T.O..)

15. A).   i) Explain about instruction pipe-lining with an example.   5M
            ii) Explain various Interconnection Structures.   5M

OR

15. B).   i) Write the major characteristics of RISC processors.   5M
            ii) What is cache coherence problem? Discuss solutions for it.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	B.Tech III Sem Regular & Supplementary Examinations December-2024
Course Name	:	Operating Systems
Course Code	:	A405305
Branch	:	CSM
Date & Session	:	30-12-2024 AN Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1.	What are the differences between thread and process?	1 M
2.	Mention the use of waitpid and exec System Calls.	1 M
3.	What is deadlock prevention?	1 M
4.	What are the advantages of a multiprocessor system?	1 M
5.	Demonstrate the working of message queues.	1 M
6.	Explain about shared memory.	1 M
7.	What is a virtual memory?	1 M
8.	Explain swapping.	1 M
9.	What is contiguous memory allocation?	1 M
10.	List any two file access methods.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	i) Explain operating systems services and functions.	5M
	ii) Explain about various types of operating systems.	5M

OR

11. B).	i) Write short notes on Process Control Block (PCB). Explain how context switching takes place between processes.	5M
	ii) What is need for System call? Describe various system calls. Write a program to implement fork() system call.	5M

12. A).	Explain Bankers algorithm for deadlock avoidance with suitable example.	10M

OR

12. B).	Explain any three Process Scheduling algorithms with an example.	10M

13. A).	What is Critical Section? What requirements are to be satisfied for a solution of critical section problem? Explain briefly.	10M

OR

13. B).	Demonstrate the usage of pipes for IPC between child and parent.	10M

14. A).	Compare Paging with Segmentation with respect to the amount of memory required by address translation structures in order to convert virtual addresses to physical addresses.	10M

(P.T.O..)

14. B). i) Explain Demand Paging.   5M

ii) A system uses 3 page frames for storing process pages in main memory. It uses the   5M
Least Recently Used (LRU) page replacement policy. Assume that all the page frames are
initially empty. What is the total number of page faults that will occur while processing
the page reference string given below? 4, 7, 6, 1, 7, 6, 1, 2, 7, 2 ?

15. A). Explain first-fit, best-fit and worst-fit strategies to manage free space with its advantages   10M
and disadvantages.

OR

15. B). Describe indexed file and indexed sequential file organization.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	B.Tech III Sem Regular & Supplementary Examinations December-2024
Course Name	:	Basic Electrical and Electronics Engineering
Course Code	:	A402204
Branch	:	CE/ ME
Date & Session	:	30-12-2024 AN Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1.	A 2 H, 3.3 H and 0.2 H inductors are connected in series. Calculate total inductance.	1 M
2.	Define power factor.	1 M
3.	What is the primary function of an MCB?	1 M
4.	Write two differences between the primary and secondary batteries	1 M
5.	What are the different types of losses in a transformer?	1 M
6.	Write the EMF equation of a DC generator?	1 M
7.	Draw the Volt-Ampere characteristics of a P-N Junction diode.	1 M
8.	Give the application of Zener diode.	1 M
9.	Why is the base layer of a BJT made very thin compared to emitter and collector layer?	1 M
10.	Give the symbol for NPN and PNP transistors.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	State and Explain Kirchhoff's laws with example.	10M
	OR	
11. B).	Derive Average & RMS Value for a single-phase ac sinusoidal waveform.	10M
12. A).	Explain the operation of ELCB with a neat sketch.	10M
	OR	
12. B).	What is meant by Earthing? Explain different types of earthing.	10M
13. A).	Explain the working principle of a single-phase transformer in detail.	10M
	OR	
13. B).	Describe the Construction details of a DC Generator with a neat sketch.	10M
14. A).	Explain the operation of a P-N junction diode and its applications.	10M
	OR	
14. B).	Explain the operation of a full-wave rectifier with its input and output waveforms.	10M
15. A).	Describe the principle of operation of a Bipolar junction Transistor.	10M
	OR	
15. B).	Explain the principle of operation of a Field Effect Transistor.	10M

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Examination	:	B.Tech III Sem Regular & Supplementary Examinations Dec-2024/Jan-2025
Course Name	:	Mathematical and Statistical Foundations
Course Code	:	A400003
Branch	:	CSM
Date & Session	:	07-01-2025 FN Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1.	State the Division algorithm.	1 M
2.	Find the GCD of (24, 300).	1 M
3.	Define Line of regression.	1 M
4.	Define Random variable.	1 M
5.	The sample of size 4 has values 25, 28, 26, 25. Find the variance of the sample.	1 M
6.	State the Central limit theorem.	1 M
7.	Define Estimate.	1 M
8.	Define type -I error.	1 M
9.	Define Stochastic process.	1 M
10.	Define order of Markov Chain.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Find the solution of the given linear congruences. $14x \equiv 12 \pmod{18}$.   5M
   ii) Solve the Linear equation $70x+112y =168$ 5M

OR

11. B). State and prove Chinese Remainder theorem.   10M

12. A). A Random variable X has the following Probability function   10M

X	0	1	2	3	4	5	6	7
P(x)	0	K	2k	2k	3k	K^2	$2k^2$	$7k^2+k$

Determine (i)k (ii)Evaluate $p(x<6), p(x \geq 6), p(0<x<5)$ (iii)If $p(x \leq k)>0.5$, find the minimum value of k and (iv)Determine mean and variance.

OR

12. B). Find the Regression lines Y on X and X on Y for the following data   10M

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

13. A). In a Normal Distribution, 10.03% of items under 25-kilogram weight and 89. 97% of the items are under 70-kilogram weight. What are the mean and standard deviation of the distribution.   10M

(P.T.O..)

13. B). A random sample of size 16 values from a normal population showed a mean of 53 and a sum of squares of deviations from the mean equals to 150. Can this sample be regarded as taken from the population having 56 as mean? Obtain 95% confidence limits of the mean of the population.   10M

14. A). In two large populations, there are 30% and 25% respectively of fair-haired people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations.   10M

OR

14. B). A Sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population.   10M

15. A). The transition probability matrix of a markov chain $\{X_n\}$, n=1,2,........... having three states 1,2 and 3 is   10M

$$P = \begin{bmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{bmatrix}$$ and the initial distribution is $P^{(0)} = [\ 0.7\ 0.2\ 0.1\ ]$. Find

(i) $P\{X_2 = 3\}$

(ii) $P\ \{X_3 = 2, X_2 = 3, X_1 = 3, X_0 = 2\}$

OR

15. B). A gambler has Rs. 2. He bets Rs. 1 at a time and wins Rs. 1 with probability ½. He stops playing if he loses Rs. 2 or wins Rs. 4.   10M

    i)   What is the tpm of the related Markov Chain?

    ii)   What is the probability that he has lost his money at the end of 5 plays?

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Examination	:	B.Tech III Sem Regular & Supplementary Examinations Dec-2024/Jan-2025
Course Name	:	Object Oriented Programming through Java
Course Code	:	A405303
Branch	:	CSE/ CSC/ CSD
Date & Session	:	07-01-2025 FN Duration: 3 hours Max. Marks: 60

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries ONE mark.   10x1=10M

1.	How Encapsulation is attained in Java?	1 M
2.	What is a constructor?	1 M
3.	State the usage of super keyword.	1 M
4.	Define Package? What is its use?	1 M
5.	How to create own exception?	1 M
6.	What do you mean by inter thread communication?	1 M
7.	Draw the AWT class hierarchy.	1 M
8.	Define an Event? Give an example.	1 M
9.	What is an Applet? List its types.	1 M
10.	Define JFrame.	1 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).   i) Recall the features of Java in brief.   5M
         ii) What is use of "this" keyword? Explain with an example program.   5M

OR

11. B).   i) Explain the structure of a Java program in brief.   5M
          ii) Write a short note on Inner classes with a program.   5M

12. A).   What is inheritance? How to inherit the characteristics of a parent class into a child class?   10M
          Explain about specification and Construction forms of inheritance with a suitable
          program.

OR

12. B).   i) What is an interface? How interfaces extend each other? Explain with a program.   5M
          ii) Distinguish between method overloading with method overriding with an example   5M
          program.

13. A).   Demonstrate the syntax and usage of try, catch, throws and finally with a suitable example   10M
          program and specify the benefits of exception handling.

OR

13. B).   i) Assess some methods of String and String Buffer classes in brief.   4M
          ii) How to create threads and set priorities to threads? Elaborate with a program.   6M

(P.T.O..)

14. A).   i) Demonstrate Delegation Event Model in brief.   5M
           ii) Why Layout Managers? Discuss about Flow Layout Manager in detail with an example   5M
           program.

OR

14. B).   i) Explain Jbutton, checkbox, radio button and comboboxs with an example program.   5M
           ii) Outline on Swings MVC architecture.   5M

15. A).   i) How to create applets? Explain how to execute applets with a program.   6M
           ii) Explain about Servlets.   4M

OR

15. B).   Build a program that should demonstrate various mouse events such as mouse clicked   10M
           event, mouse pressed event, mouse released event, mouse entered event and mouse exited
           event.

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