CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Construction Technology and Project Management

(Civil Engineering)

Date: 26.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define Planning.	2 M
2.	What is the significance of social responsibility for an organization?	2 M
3.	What is slack? What are different types of slack?	2 M
4.	What are the application areas of CPM and PERT.	2 M
5.	What is resource planning in project management.	2 M
6.	List out different budget controlling methods.	2 M
7.	Define Contract.	2 M
8.	Define Tender and Tender forms.	2 M
9.	What is Management Information System?	2 M
10.	What is Occupational Safety and Hazard Assessment (OSHA).	2 M

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

11.A). Explain different decision making tools and techniques employed managements.   10M

OR

11. B). Explain various steps in planning and mention the limitations in planning.   10M

12. A). Draw a CPM network for the following data. Determine i) Earliest and latest times of each activity ii) critical path and total duration of the project and iii) Total float of each activity.   10M

Activity	Duration (Days)
1 - 2	4
1 - 3	1
2 - 4	1
3 - 4	1
3 - 5	6
4 - 9	5
5 - 6	4
5 - 7	8
6 - 8	1
7 - 8	2
8 - 10	5
9 - 10	7

OR

12. B). What is float? Explain different types of floats.   10M

(P.T.O..)

13. A). What is scheduling. Discuss in brief various forms of scheduling.   10M

                                        OR

13. B). Discuss in brief the resources allocation problem. What are the methods of solving the   10M
         problem?

14. A). List various mechanisms of dispute resolution. Explain the Arbitration process in detail.   10M

                                        OR

14. B). Mention different types of construction contracts. Explain Lump sum contact in detail.   10M

15. A). What is the significance of safety in construction? Explain the role of human factors in   10M
         safety.

                                        OR

15. B). Explain the salient features of workmen compensation act in detail.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Flexible AC Transmission System Devices

(Electrical & Electronics Engineering)

Date: 01.12.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	List the different stability issues that limits the transmission capability.	2 M
2.	What are FACTS controllers?	2 M
3.	Define the single phase full wave bridge converter principle.	2 M
4.	Mention the basic concept of current source converter.	2 M
5.	Draw the circuit diagram of midpoint voltage regulation for line segmentation.	2 M
6.	List various shunt compensator.	2 M
7.	What is meant by STATCOM?	2 M
8.	Draw the V-I characteristic of the SVC.	2 M
9.	What is meant by series capacitive compensation?	2 M
10.	Define objective of TCSR.	2 M

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

11.A).	Explain the basic types of FACTS controllers with neat diagrams.	10M
	OR	
11. B).	Explain the power flow in AC systems both in Parallel and meshed paths.	10M
12. A).	Construct the single-phase full wave bridge converter with neat diagrams.	10M
	OR	
12. B).	Discuss the basic concept of voltage sourced converter and give comparison between VSC and CSC.	10M
13. A).	Explain the objectives of shunt compensation in transmission lines in view of midpoint segmentation and end of the line voltage stability.	10M
	OR	
13. B).	Illuminate the operation of TCR with circuit diagrams and waveforms.	10M
14. A).	Explain about the role of SVC in improving the stability limit and enhancing the power system damping.	10M
	OR	
14. B).	Explain the summary of compensation control with necessary block diagrams.	10M
15. A).	Discuss the objectives of series compensation. Describe how series compensation can be used for power oscillation damping.	10M
	OR	
15. B).	Explain the operation of Thyristor Switched series Capacitor with neat diagram.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Reliability Engineering

(Electrical & Electronics Engineering)

Date: 01.12.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	State the properties of a Poisson distribution.	2 M
2.	What is the expected value of a random variable?	2 M
3.	What is network reliability, and how is it evaluated?	2 M
4.	What is meant by a reduced event tree?	2 M
5.	Write the mathematical expression that relates $R(t)$ to $F(t)$.	2 M
6.	State the key assumptions made in network reliability evaluation.	2 M
7.	Define limiting state probabilities in a Markov chain.	2 M
8.	What is the significance of state space diagrams in reliability modeling?	2 M
9.	What is the significance of duration in frequency and duration concepts?	2 M
10.	What are the advantages of using network reduction techniques in reliability evaluation?	2 M

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

11.A).	i) Derive an expression for Standard Deviation of Binomial Distribution.	5M
	ii) Illustrate the correlation between Poisson Distribution and Binomial Distribution.	5M

OR

11. B).	i) Explain the concept of hazard rate with examples.	5M
	ii) Derive the expression for reliability in terms of hazard rate.	5M

12. A).	i) How is a series-parallel system analyzed for reliability? Provide a step-by-step example.	5M
	ii) Describe the conditional probability method for evaluating network reliability. Include an example.	5M

OR

12. B).	i) Discuss the relationship between tie-sets and cut-sets in a network.	5M
	ii) Explain the steps to calculate the reliability of a partially redundant system. Include an example.	5M

13. A).	Explain the interrelationships among the reliability function $R(t)$, the cumulative distribution function $F(t)$, the probability density function $f(t)$, and the hazard rate $\lambda(t)$. Illustrate these relationships with a diagram.	10M

OR

13. B).	i) Derive the expression for the Mean Time to Failure (MTTF) of a series system.	5M
	ii) Derive the expression for the Mean Time to Failure (MTTF) of a parallel system.	5M

(P.T.O..)

14. A).   i) Define limiting state probabilities in a Markov chain. Derive the conditions under which limiting probabilities exist.   5M

        ii) What is an absorbing state in a Markov chain? Discuss how to analyze Markov chains with absorbing states.   5M

OR

14. B).   i) Discuss how to construct the state transition matrix for a continuous Markov process.   5M

        ii) Explain how continuous Markov processes are used to model systems with redundancy.   5M

15. A).   i) Using frequency balance approach, derive the expressions for frequency of encountering states in Two component repairable model.   5M

        ii) How are state transition rates used to evaluate the reliability of multi-state systems? Illustrate with an example.   5M

OR

15. B).   Discuss the impact of common mode failures on series, parallel, and mixed systems. Include examples to illustrate how CMFs degrade system reliability.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Operations Research
(Mechanical Engineering)

Date: 05.12.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1. Describe the applications of Operations Research in managerial decision making.   2 M
2. What are the limitations of linear programming technique?   2 M
3. What is the unbalanced transportation problem? How do you start in this case?   2 M
4. Give the mathematical formulation of an assignment problem.   2 M
5. How will you solve the sequencing of 'n' jobs on three machines?   2 M
6. Explain with examples the failure mechanisms of an item.   2 M
7. Write a note on zero sum game.   2 M
8. Discuss about a deterministic inventory model with shortages.   2 M
9. State some important properties of poission's process.   2 M
10. Write short note on dynamic programming.   2 M

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

11.A). Elaborate the phases of Operations Research.   10M

OR

11. B). Solve the following Linear Programming Problem by Big M method.   10M
Max $Z = -2X_1 - X_2$
S.T.
$3X_1 + X_2 + X_3 = 3$
$4X_1 + 3X_2 \geq 6$
$X_1 + 2X_2 \leq 4$
$X_1, X_2 \geq 0$

12. A). Solve the following transportation problem.   10M

	F1	F2	F3	F4	F5	Requirement
S1	4	2	3	2	6	8
S2	5	4	5	2	1	12
S3	6	5	4	7	3	14
Demand	4	4	6	8	8	

OR

12. B). A company has 4 salesmen A,B,C,&D. These salesmen are to be allotted 4 cities1,2,3&4.   10M
The estimated profit per day for each salesman in each city is given in the following table.
What is the optimum assignment which will yield maximum profit.

	1	2	3	4
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

(P.T.O..)

13. A). Use the graphical method to minimize the following jobs on 5 machines shown. For each machine find the job which should be done first. Also calculate the total time needed to complete both the jobs. 10M

Job 1	Sequence	A	B	C	D	E
	Time (hrs)	3	4	2	6	2
Job 2	Sequence	B	C	A	D	E
	Time (hrs)	5	4	3	2	6

OR

13. B). A computer contains 10,000 resistors. When any one of the resistor fails, it is replaced. The cost of replacing a single resistor is Rs. 10/- only. If all the resistors are replaced at the same time, the cost per resistor would be reduced to Rs. 3.50/-. The percent surviving by the end of month 't' is as follows: 10M

Month (t)	0	1	2	3	4	5	6
% surviving by the end of month	100	97	90	70	30	15	0

What is the optimum plan?

14. A). Solve the following game. 10M

	B1	B2
A1	-6	7
A2	4	-5
A3	-1	-2
A4	-2	5
A5	7	-6

OR

14. B). A shopkeeper has a uniform demand of an item at the rate of 50 items per month. He buys from supplier at a cost of Rs. 6/- per item and the cost of ordering is Rs. 10/- each time. If the stock holding cost are 20% per year of stock value, how frequently should be replenish his stocks? 10M

Now suppose the supplier offers a 5% discount on orders between 200 and 999 items and a 10% discount on orders exceeding or equal to 1000. Can the shopkeeper reduce his costs by taking advantage of either of these discounts?

15. A). An insurance company has 3 clerks in its branch office. People arriving with claims against the company are found to arrive in a Poisson fashion at an average rate of 20 per 8 hour a day. The amount of time the clerk spends with the client is found to have an exponential distribution with a mean of 40 minutes. The clients are processed in the order of their appearance. (i) How many hours a week a clerk expects to spend with the clients? (ii) How much time on average a client spends in the branch office. (iii) What is the % of idle time of each clerk? (iv) Determine the expected number of clients in the system. 10M

OR

15. B). Suppose there are n machines which can perform 2 jobs. If x of them do the first job, then they produce goods worth $g(x) = 3x$ and if y of the machines performs the second job, then they produce goods worth $h(y) = 25y$. Machines are subjected to depreciation, so that after performing the first job only $a(x) = x/3$ machines remain available and after performing the second job by $b(y) = 2/3 y$ machines remain available in the beginning of the second year. The process is repeated with remaining machines. Obtain the maximum total return after 3 years and also find the optimal policy in each year. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Embedded System Design
(Electronics & Communication Engineering)

Date: 24.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Give few examples of embedded systems.	2 M
2.	What is the difference between a system and an embedded system?	2 M
3.	Give the advantages of PLD.	2 M
4.	What are the various types of memory in embedded systems?	2 M
5.	Explain the need of a watchdog timer.	2 M
6.	What is the need of Brown out protection circuit in embedded systems	2 M
7.	List the features of RTOS.	2 M
8.	What is a Task Control Block?	2 M
9.	Give the function of sockets.	2 M
10.	Define device driver.	2 M

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

11.A).	What is an embedded system? Explain the different applications of embedded systems.	10M
	OR	
11. B).	Compare general purpose computing system and embedded system.	10M
12. A).	Describe the memory shadowing.	10M
	OR	
12. B).	Explain the different on-board communication interfaces in brief.	10M
13. A).	Explain the various steps involved in the assembling of an assembly language program.	10M
	OR	
13. B).	Discuss the various Embedded Firmware Design Approaches in detail.	10M
14. A).	Explain how multithreading can improve the performance of an application.	10M
	OR	
14. B).	Explain in brief about RTOS? Compare OS and RTOS.	10M
15. A).	Explain the concept of Shared memory in task communication.	10M
	OR	
15. B).	Explain message passing technique for inter process communication in detail.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Microwave Antennas

(Electronics & Communication Engineering)

Date: 24.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1. Define Radian and Steradian.   2 M
2. What is Radiation Intensity?   2 M
3. What are the limitations of a spiral antenna?   2 M
4. Compare the spiral and log periodic antennas.   2 M
5. What is binomial array antenna?   2 M
6. Define non-uniform distribution array antenna.   2 M
7. Draw the various shapes of patch.   2 M
8. Write the advantages of microstrip antennas.   2 M
9. What are Metamaterials?   2 M
10. List the advantages of HFSS.   2 M

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

11.A). Explain about Directivity and Radiation Intensity.   10M

OR

11. B). State Babinet's Principle and explain how it is useful in antenna Theory.   10M

12. A). Outline the Fourier Transforms-Spectral Domain.   10M

OR

12. B). Explain log periodic antennas.   10M

13. A). Briefly explain about Fourier Transform method.   10M

OR

13. B). Explain in detail about Binomial arrays.   10M

14. A). Explain the salient features of Microstrip Antennas and list out the advantages and limitations of Microstrip antennas.   10M

OR

14. B). Explain the feed methods of rectangular patch antenna.   10M

15. A). Explain the properties, Principle of operations of Metamaterials.   10M

OR

15. B). What are the different structures of EBG? Give details.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: **Radar Systems**
(Electronics & Communication Engineering)

Date: 26.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What are the functions of RADAR?	2 M
2.	What are the main reasons for the failure of the simple form of the radar equation?	2 M
3.	What is the Doppler effect?	2 M
4.	If the target and the Frequency source are moving close to each other, with constant velocity, explain the change in the frequency?	2 M
5.	MTI radar operates at 5GHz with a PRF of 1KHz, find second lowest blind speed of the radar.	2 M
6.	What limitations of MTI Performance?	2 M
7.	Define Beam, rotation and Target axis in conical scanning.	2 M
8.	What is Amplitude Comparison monopulse?	2 M
9.	Write the equation for Noise figure.	2 M
10.	Define noise temperature and describe the relation between noise figure and noise temperature.	2 M

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

11.A). Explain the basic principles of Radar and discuss about various parameters which improve the performance of the Radar.   10M

OR

11. B). Explain about radio frequencies and their applications.   10M

12. A). Explain the principle of operation of CW Doppler radar with non-zero IF receiver.   10M

OR

12. B). With suitable diagrams, explain the constructional difference of CW radar and simple pulse Doppler radar?   10M

13. A). Explain the concept of staggered PRFs in MTI radar.   10M

OR

13. B). Explain the following limitations of MTI radar.   10M
i) Equipment instabilities. ii) Scanning modulation.

14. A). i) Explain the types of tracking radar systems.   5M
ii) Explain Split-range-gate tracking with diagrams.   5M

(P.T.O..)

OR

14. B). i) Discuss in detail about the Amplitude fluctuations and how its effects are minimized.   5M

ii) Explain Mono pulse tracking in two angle coordinates.   5M

15. A). Describe the operation of branch and balanced type duplexers with necessary diagrams.   10M

OR

15. B). i) Write short notes on constant false alarm rate receiver?   5M

ii) What is a matched filter receiver? Derive its frequency response function.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Real Time Operating Systems
(Electronics & Communication Engineering)

Date: 26.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What is the difference between a file and a directory in Unix/Linux?	2 M
2.	Differentiate a process and a thread in Unix/Linux?	2 M
3.	What is task scheduling in an RTOS?	2 M
4.	How the semaphore used for synchronization in an RTOS?	2 M
5.	What is a "buffer" in an RTOS, and how is it used to manage I/O operations?	2 M
6.	How does an RTOS handle timeouts for I/O operations?	2 M
7.	What is the difference between a hardware interrupt and a software interrupt in an RTOS?	2 M
8.	Discuss the operation of RTOS handle timer-based events.	2 M
9.	Identify the role of the kernel in Embedded Linux?	2 M
10.	Elaborate how the µC/OS-II handles task priorities?	2 M

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

11.A). What is a pipe in Unix/Linux, and how does it work? Provide an example where the output of one command is used as input to another command.   10M

OR

11. B). What is the purpose of the commands in Unix/Linux?   10M

12. A). Discuss the difference between preemptive and non-preemptive scheduling in an RTOS. Provide examples of scenarios where each would be appropriate.   10M

OR

12. B). Discuss the concept of mutual exclusion in the context of an RTOS. How do semaphores and mutexes ensure mutual exclusion in task synchronization?   10M

13. A). Explain the concept Pipes, Event Registers with appropriate diagrams.   10M

OR

13. B). Elaborate the basic I/O concepts and mention its advantages.   10M

14. A). Explain the Programmable timer with suitable examples.   10M

OR

14. B). Discuss about soft timers and explain the need for it.   10M

15. A). What is the role of the "Virtual Timer" in TinyOS? Explain how timers are used in the context of TinyOS to schedule periodic tasks and events.   10M

OR

15. B). Discuss about features and applications of Android OS.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Low Power VLSI Design

(Electronics & Communication Engineering)

Date: 01.12.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What is surface scattering?	2 M
2.	List out Sources of Power Dissipation.	2 M
3.	Compare pipelining and parallel processing approaches.	2 M
4.	Draw the circuit diagram of VTCMOS inverter circuit	2 M
5.	Explain the Low-Voltage and Low-Power Logic Styles of Adders.	2 M
6.	Explain the basic principle of Wallace tree Multiplier	2 M
7.	Classify the types of multiplier architectures	2 M
8.	Explain the Low power multipliers used in VLSI design.	2 M
9.	Draw and explain 1-T DRAM circuit.	2 M
10.	Draw and explain the fundamental architecture of a simple ROM.	2 M

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

11.A).	Write about the following: (i) Hot electrons affect (ii) Velocity saturation affect.	10M
	OR	
11. B).	What are the three different sources of power dissipation in digital ICs? Explain them.	10M
12. A).	Explain Parallel Processing as Architectural level approach.	10M
	OR	
12. B).	Design VTCMOS based Inverter and Then explain the same.	10M
13. A).	Desing 4-bit ripple carry adder by taking an example.	10M
	OR	
13. B).	Explain low voltage- low power logic styles in detail.	10M
14. A).	Explain the working principle of booth multiplier with flow chat.	10M
	OR	
14. B).	List out different comparisons of Braun Multiplier and Baugh-Wooley Multiplier in detail.	10M
15. A).	Design low power 6T SRAM with read and write operations.	10M
	OR	
15. B).	Explain future trends and development of ROMs.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Satellite Communications
(Electronics & Communication Engineering)

Date: 01.12.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1. Explain how the Earth's eclipse impacts satellite communication.   2 M

2. Compare different applications of satellite systems based on their specific requirements and functionality.   2 M

3. Define system noise temperature and explain its importance in satellite communication.   2 M

4. Evaluate the effectiveness of frequency reuse techniques for improving the C/N ratio in satellite communications.   2 M

5. Propose an advanced approach to enhance the reliability of satellite links under cloud attenuation conditions.   2 M

6. Summarize the differences between spread spectrum systems and conventional communication systems.   2 M

7. Demonstrate the significance of tracking systems in maintaining satellite alignment.   2 M

8. Develop a system using differential GPS for applications requiring high-accuracy positioning and navigation.   2 M

9. Assess the feasibility of using the tree algorithm for real-time packet switching in satellite networks.   2 M

10. Describe the concept of packet reservation and its role in satellite packet switching.   2 M

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

11.A). i) List and define the main orbital parameters used for positioning a satellite.   5M
    ii) Derive the equation for a satellite orbit.   5M

OR

11. B). Calculate the look angles and range for a geostationary satellite from a given earth station location, applying relevant equations.   10M

12. A). Explain the purpose of telemetry, tracking, and control (TT&C) in satellite operations and illustrate its components with a diagram.   10M

OR

12. B). Describe and derive the satellite link equation and explain the significance of each term in the calculation of the C/N ratio.   10M

13. A). Analyze the impact of rain-induced cross-polarization interference on high-frequency satellite links, identifying the primary factors that contribute to this issue.   10M

OR

13. B). Compare FDMA, TDMA, and CDMA, highlighting their key features and how they differ in resource allocation for satellite communication.   10M

(P.T.O..)

14. A). i) Design a detailed operation plan for an earth station, outlining the essential equipment required for reliable performance and describing each component's role. 5M

ii) Evaluate different power testing methods for earth station equipment and discuss which methods are most suitable under specific operational conditions. 5M

OR

14. B). i) Discuss in detail about GPS Position Location principles. 5M

ii) Summarize the differences between GPS and Differential GPS, focusing on their applications and accuracy. 5M

15. A). Demonstrate the improvements Slotted ALOHA provides over Pure ALOHA in reducing collision probability in packet transmission. 10M

OR

15. B). Apply the packet reservation method to a scenario in satellite communication where multiple users require real-time data transmission with minimal delays. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Computer Networks
(Electronics & Communication Engineering)

Date: 05.12.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define network? What is it often referred as?	2 M
2.	Write short notes on guided transmission media.	2 M
3.	Abbreviate CSMA. List the types of CSMA.	2 M
4.	What is error detection and correction?	2 M
5.	Differentiate broadcast and multicast.	2 M
6.	State the importance of leaky bucket algorithm with an example.	2 M
7.	Define UDP and State its main purpose.	2 M
8.	Illustrate data transfer in TCP.	2 M
9.	Define SNMP.	2 M
10.	What is IMAP and POP3?	2 M

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

11.A).	Explain various uses of computer networks with examples.	10M
	OR	
11. B).	Explain OSI model and its layers with neat sketch.	10M
12. A).	Explain in detail about ALOHA mechanism and its types with neat diagram.	10M
	OR	
12. B).	Write in detail about sliding window protocol.	10M
13. A).	Explain Dijkstra shortest path algorithm? Also show working of Dijkstra algorithm with an example.	10M
	OR	
13. B).	Describe problems and solutions associated with distance vector routing.	10M
14. A).	Describe TCP header format.	10M
	OR	
14. B).	Explain elements of Transport protocol.	10M
15. A).	What is DNS? Explain the services provided by DNS.	10M
	OR	
15. B).	Explain HTTP protocol with neat sketch.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Design Patterns
(Common for CSE & IT)

Date: 24.11.2025 AN | Time: 3 hours | Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What are the main benefits of using design patterns?	2 M
2.	Define pattern language in software design.	2 M
3.	What is meant by multiple look-and-feel support in UI systems?	2 M
4.	Write a note on user-operations spelling standards in document editors.	2 M
5.	Define Prototype pattern and write one usage scenario.	2 M
6.	What is Singleton and why is it needed?	2 M
7.	Define the intent of Composite pattern.	2 M
8.	List the participants of the Flyweight pattern.	2 M
9.	What is the purpose of the Interpreter pattern?	2 M
10.	Define Visitor pattern with a simple example domain.	2 M

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

11.A).	Explain the Catalog of design patterns.	10M
	OR	
11. B).	Discuss how design patterns help in solving object-oriented design problems.	10M
12. A).	Explain embellishing the user interface with examples using patterns.	10M
	OR	
12. B).	Discuss how document editors support multiple window systems with suitable patterns and architecture.	10M
13. A).	Explain Builder pattern with structure, flow, and real-time application.	10M
	OR	
13. B).	Describe the motivation, structure, and advantages of Singleton pattern.	10M
14. A).	Illustrate the structure and operation of the Composite pattern with a document example.	10M
	OR	
14. B).	Explain the Bridge pattern with a diagram and real-time example.	10M
15. A).	Explain Template Method pattern with example and uses in frameworks.	10M
	OR	
15. B).	Explain the Chain of Responsibility.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Machine Learning

(Computer Science & Engineering)

Date: 24.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1. What is the role of hypothesis space in concept learning?   2 M
2. List two characteristics of problems suitable for decision tree learning.   2 M
3. How does a neural network model handle non-linear data?   2 M
4. Why are multilayer networks preferred over single-layer networks for complex problems?   2 M
5. Define Bayesian belief networks, and how are they used in modeling dependencies between variables?   2 M
6. What is case-based reasoning, and how does it relate to instance-based learning?   2 M
7. How does the fitness function influence the evolution process in Genetic Algorithms?   2 M
8. What is the difference between First Order and propositional rules?   2 M
9. Write the significance of search control knowledge in Explanation-Based Learning?   2 M
10. What is the benefit of combining Inductive Learning with Analytical Learning?   2 M

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

11.A). Demonstrate the Find-S algorithm. Discuss its work with the help of an example and highlight its limitations.   10M

OR

11. B). Summarize the steps involved in building a decision tree. How does the tree grow, and what strategies are used for selecting attributes and determining splits?   10M

12. A). Explain the back-propagation algorithm used in neural networks. How does it work, and why is it essential for training multilayer networks?   10M

OR

12. B). Explain how to estimate the accuracy of a hypothesis using different evaluation methods. Compare the performance of a hypothesis using training data versus test data.   10M

13. A). Demonstrate the Naïve Bayes classifier and how it applies Bayes Theorem to classification tasks. Provide an example of its application in a real-world scenario.   10M

OR

13. B). Explain the concept of "probably approximately correct" (PAC) learning. Discuss the trade-off between hypothesis complexity and sample complexity in the PAC model.   10M

14. A). Explain the Q-learning algorithm in detail. Provide an example of Q-learning in a real-world application.   10M

(P.T.O..)

OR

14. B). Discuss the concept of function approximation in Reinforcement Learning and how it 10M
helps in scaling to large or continuous state spaces.

15. A). Describe the process of learning search control knowledge through EBL. Identify the 10M
impact does it have on problem-solving performance?

OR

15. B). Analyze the key challenges in combining inductive and analytical learning techniques? 10M
Discuss the difficulties in integrating prior knowledge with data-driven hypothesis
generation.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Ethical Hacking

(Common for CSE & CSM)

Date: 26.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks.   **10x2=20M**

1.	Define a SYN attack.	2 M
2.	What is the significance of IP subnets in a network?	2 M
3.	Outline a buffer overflow attack.	2 M
4.	What is the purpose of a backdoor in penetration testing?	2 M
5.	Define computer fraud with an example.	2 M
6.	What is a digital certificate, and what purpose does it serve in secure communications?	2 M
7.	What is DNS poisoning?	2 M
8.	Define steganography.	2 M
9.	Outline Cross-Site Scripting?	2 M
10.	Define side-channel attack.	2 M

PART-B

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

11.A). Explain IP addressing and subnetting in detail. Include the importance of subnet masks and provide examples to illustrate.   10M

OR

11. B). Define DoS and DDoS attacks and compare their impact on network security.   10M

12. A). Describe various types of input validation attacks, including SQL injection and cross-site scripting. How can input validation help prevent these attacks?   10M

OR

12. B). Explain how social engineering attacks manipulate human behavior to gain unauthorized access to systems with real-world examples.   10M

13. A). Determine the importance of strategic planning in managing cyber security threats with examples.   10M

OR

13. B). Demonstrate cryptographic hash functions with examples.   10M

14. A). Compare and contrast Network-based Intrusion Detection Systems (NIDS) and Host-based Intrusion Detection Systems (HIDS).   10M

OR

14. B). Explain the process of Hacking Wireless Networks with preventive measures.   10M

15. A). Describe the key elements and structure of a Penetration Test Deliverable. Explain why this document is critical for stakeholders and how it helps improve security post-testing.   10M

OR

15. B). Demonstrate the steps involved in conducting a vulnerability assessment for a web application with an example.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Big Data Analytics
(Common for CSE, IT & AIM)

Date: 01.12.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks. 10x2=20M

1.	What are the four V's of big data?	2 M
2.	Define the big data analytics.	2 M
3.	Which node takes the responsibility when the active Name Node fails?	2 M
4.	List building blocks of Hadoop systems.	2 M
5.	How many mappers run for a map Reduce job?	2 M
6.	Define map Reduce.	2 M
7.	What is a PIG? Write syntax for Bag in PIG.	2 M
8.	What are the different types of data in Pig?	2 M
9.	What do you mean by windowing in HiveQL?	2 M
10.	Is Hive a database? Justify your answer.	2 M

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

11.A). Explain how relational databases and Big Data systems approach scalability. Why is horizontal scaling preferred in Big Data systems, and what are the limitations of vertical scaling in relational databases? — 10M

OR

11. B). Discuss how NoSQL databases manage unstructured and semi-structured data in Big Data applications. Why they are better suited for this than traditional relational databases? — 10M

12. A). What is HDFS? Draw and Explain about the Architecture of HDFS. — 10M

OR

12. B). Explain the concept of block size in HDFS. Discuss how the block size affects performance, storage efficiency, and fault tolerance in Hadoop Distributed File System. — 10M

13. A). With suitable example, briefly describe usage of Map Reduce with and without combiner. — 10M

OR

13. B). Explain the Map Reduce programming model and its architecture. Discuss how map Reduce enables distributed data processing in Hadoop, highlighting the roles of Mapper and Reducer. — 10M

14. A). List PIG Commands. Explain PIG commands with examples. — 10M

OR

14. B). Explain the following operators in Pig Latin: — 10M
    i) grouping and joining
    ii) combining and splitting
    iii) filtering operators

(P.T.O..)

15. A). Draw a neat sketch, describe the key components of Apache HIVE architecture. 10M

OR

15. B). Explain the process of creating an External HIVE Table to Connect to the HBase 10M
Customer Information Table.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Scripting Languages
(Common for CSD & AID)

Date: 24.11.2025 AN　　　　　Time: 3 hours　　　　　Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.　　　　　10x2=20M

1.	How is exception handling done in Ruby?	2 M
2.	What are the basic components of a Ruby program?	2 M
3.	Write the syntax to define a Ruby class in C.	2 M
4.	What are the benefits of embedding Ruby in a C application?	2 M
5.	Mention common uses of scripting languages.	2 M
6.	Differentiate between client-side and server-side scripting.	2 M
7.	Write about foreach and for in Perl.	2 M
8.	What is the difference between a package and a module in Perl?	2 M
9.	What is the difference between set and global in TCL?	2 M
10.	Differentiate between pack, grid, and place in Tk.	2 M

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

11.A). How Ruby CGI handles cookies and sessions? Demonstrate using the sample Ruby CGI Scripts　　10M

OR

11. B). Discuss the lifecycle of a Ruby program from writing code to execution.　　10M

12. A). Explain about different Ruby objects in C.　　10M

OR

12. B). Write a Ruby programming for wrapping of C structures in Jukebox extension.　　10M

13. A). Explain various regular expressions and pattern matching operators available in PERL with examples.　　10M

OR

13. B). i) Enumerate various usages of Scripting languages.　　5M
ii) Discuss about different conditional and iterative statements available in Perl with their syntaxes.　　5M

14. A). Write a Perl script that packs a structure containing strings and integers, writes it to a file, then reads and unpacks the same data. Explain each step.　　10M

OR

14. B). Write a Perl program that maintains student records using a hash of hashes. Include options for adding, retrieving, and deleting records.　　10M

15. A). Explain how input and output operations are handled in TCL.　　10M

OR

15. B). i) Write Tk script to create a login form.　　5M
ii) How are events handled in Tk?　　5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Artificial Intelligence for Cyber Security
(CSM)

Date: 24.11.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   **10x2=20M**

1.	What do you mean of Supervised Machine Learning? List the types.	2 M
2.	Define DDOS? List out the types of Time Series.	2 M
3.	Discuss about Lexical Features.	2 M
4.	What is the URL blacklisting?	2 M
5.	Compare CAPTCH and Re-CAPTCH?	2 M
6.	Explain the Scan Detection with an example.	2 M
7.	Summarize the Misuse Sequence Detection System.	2 M
8.	List out the applications of Multi-Agent IDS.	2 M
9.	Define SMTP with two examples.	2 M
10.	Discuss how data is collecting from Mail Server.	2 M

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

11.A).	Compare Structured Data and Unstructured Data? Explain about Reinforcement Learning with an example.	10M

OR

11. B).	Draw and Explain about Boosting algorithm with neat sketch.	10M

12. A).	What is Host Based Features? Compare between Lexical Features and Web Content Based Features.	10M

OR

12. B).	Explain the following with an example. (i) Site popularity features (ii) Control URLs	10M

13. A).	Illustrate various types of CAPTCHA? Explain with their applications.	10M

OR

13. B).	Analyze, how solving CAPTCHA is efficient Neural Network.	10M

14. A).	Construct the architecture of IDS based on Neural Network with neat sketch.	10M

OR

14. B).	Illustrate the following Malware Attacks. (i)Bots (ii)Bugs (iii)Spyware (iv)Trojan horses	10M

15. A).	Explain about how featurization techniques to convert text based emails to numeric values.	10M

OR

15. B).	Discuss the following with their applications. (i) Mail Server (ii) HTTP	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Big Data Analytics and Business Intelligence
(CSM)

Date: 01.12.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define correlation.	2 M
2.	Describe the purpose of forecasting in data analytics.	2 M
3.	List two common business applications of Big Data.	2 M
4.	What is the role of scalability in Hadoop?	2 M
5.	What is the purpose of the Grunt shell in Pig?	2 M
6.	What is Apache Spark, and how is it different from Hadoop?	2 M
7.	Write one computational limitation of Big Data processing.	2 M
8.	Define Big Data analytics.	2 M
9.	How does a decision tree help in classification tasks?	2 M
10.	Why is Business Intelligence important for businesses today?	2 M

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

11.A). Compare and contrast correlation and regression. Explain how each method is used in   10M
data analysis, including their applications and limitations.

OR

11. B). Define Big Data and its characteristics. Explain the challenges and opportunities that Big   10M
Data presents to organizations today.

12. A). Explain the steps involved in implementing Big Data solutions in a business context.   10M
Discuss the challenges and key considerations for successful Big Data adoption in
organizations.

OR

12. B). Explain the working of HDFS, focusing on its architecture, data storage, and fault   10M
tolerance mechanisms.

13. A). Compare Hive Query Language (HQL) with SQL. Discuss the syntax similarities and   10M
differences and give examples of HQL commands commonly used for Big Data analysis.

OR

13. B). Define Resilient Distributed Datasets (RDDs) in Spark. Discuss their characteristics,   10M
including fault tolerance and parallel processing.

(P.T.O..)

14. A). Explore the advancements in Big Data storage technologies. Discuss the role of distributed storage systems, cloud storage, and databases like NoSQL in handling large volumes of data. 10M

OR

14. B). Define Big Data analytics and its role in modern data-driven decision-making. Discuss the different types of analytics, such as descriptive, diagnostic, predictive, and prescriptive analytics. 10M

15. A). Discuss various approaches for analyzing Big Data, including descriptive, diagnostic, predictive, and prescriptive analysis. 10M

OR

15. B). Compare and contrast OLTP (Online Transaction Processing) and OLAP (Online Analytical Processing) systems. Discuss their characteristics, use cases. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Introduction to Database Management Systems
(Common for CE, EEE, ME & ECE)

Date: 28.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What are the responsibilities of a DBA?	2 M
2.	What is the difference between strong and weak entity sets?	2 M
3.	List the set operations of SQL.	2 M
4.	What are the SQL statements used for transaction control?	2 M
5.	Define privilege authorization in SQL. Give an example.	2 M
6.	What is the use of subqueries? Give an example.	2 M
7.	Show an example for the use of recursion in SQL.	2 M
8.	Define Triggers in SQL.	2 M
9.	What is meant by redundancy?	2 M
10.	Compare functional dependency with transitive dependency.	2 M

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

11.A). Explain the following components of the database system   10M
    i) Storage manager
    ii) Query processor

OR

11. B). Construct an E-R diagram for a car-insurance company whose customers own one or   10M
more cars each. Each car has associated with it zero to any number of recorded accidents.
State any assumptions you make.

12. A). Consider the bank database as given below. The primary keys are underlined.   10M
branch(branchname,branchcity,assets)
customer(customername,customerstreet,customercity)
loan(loannumber,branchname,amount)   *borrower(customername,loannumber)*
account(accountnumber,branchname,balance) depositor(customername,accountnumber)
Construct the following SQL queries for this relational database.
i). Find all customers of the bank who have an account but not a loan.
ii). Find the names of all customers who live on the same street and in the same city as "Smith".
iii). Find the names of all branches with customers who have an account in the bank and who live in "Harrison".

OR

12. B). How does a DBMS represent a relational query evaluation plan? Explain it with an   10M
example.

(P.T.O..)

13. A). Explain the aggregate functions in SQL with an example.   10M

OR

13. B). Consider student database which contains the following.   10M
Student details: Name, ID, DoB, branch, DoJ
Course details : Course_name, Course_id, Stud_id, Faculty name, Marks.
    i)   Write the DDL, DML, DCL commands for the student database.
    ii)   Write queries to list the students branchwise and markwise.

14. A). Justify the need of embedded SQL. Consider the relation student(studentno, name, mark   10M
and grade). Write embedded dynamic SQL statements to retrieve all the students' records
whose mark is more than 90.

OR

14. B). Suppose there are two relations *r* and *s*, such that the foreign key B of *r* references the   10M
primary key A of *s*. Summarize how the trigger mechanism can be used to implement the
on delete cascade option, when a tuple is deleted. from s.

15. A). Explain about Boyce–Codd Normal Form (BCNF) in detail.   10M'

OR

15. B). Analyse and explain the following in detail: 10M
    i) Domain-Key Normal Form
    ii) Loss-less join dependency

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Disaster Management and Mitigation
(Common for all Branches)

Date: 28.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define hazard.	2 M
2.	What do you meant by environmental stress?	2 M
3.	What are the different types of environmental hazards?	2 M
4.	Define endogenous hazard.	2 M
5.	Define earthquake.	2 M
6.	Define mitigation.	2 M
7.	Define cyclone.	2 M
8.	What do you meant by soil erosion?	2 M
9.	What are the different stages of disaster management?	2 M
10.	Define rehabilitation.	2 M

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

11.A).	Discuss in detail about the concept of environmental disaster and its impact on human life.	10M

OR

11. B).	Explain in detail about landscape and perception approaches and its relation with human ecology.	10M
12. A).	Discuss in detail about man induced hazards.	10M

OR

12. B).	Explain in detail about planetary disasters.	10M
13. A).	Explain in detail about causes, distribution and effects of volcanoes.	10M

OR

13. B).	Discuss in detail about causes and distribution of earthquakes.	10M
14. A).	Discuss in detail about the causes and effects of drought.	10M

OR

14. B).	Explain in detail about the causes and effects of chemical hazards.	10M
15. A).	Explain in detail about the preparedness in disaster management.	10M

OR

15. B).	Discuss in detail about emergency stage in disaster management.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Python Programming
(Common for all Branches)

Date: 28.11.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	How can you read input from the keyboard in Python? Provide an example code snippet.	2 M
2.	Explain the concept of data types in Python. Discuss the characteristics and usage of strings as a data type.	2 M
3.	Describe the concept of conditional iteration and give an example of its implementation in programming.	2 M
4.	Discuss the significance of exceptions in file handling.	2 M
5.	What are the different methods available for manipulating strings in Python?	2 M
6.	Define dictionaries and sets in Python and provide a practical example for each.	2 M
7.	Discuss the role of methods in object-oriented programming and provide an example.	2 M
8.	How do classes and functions work together in object-oriented programming?	2 M
9.	Name the module commonly used for GUI programming in Python and describe its functionality.	2 M
10.	Differentiate between Radio Buttons and Check Buttons in GUI programming, and provide an example where each would be appropriate to use.	2 M

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

11.A).	i) Write a Python program that prompts the user to enter their name and age. Based on the age entered, display a message indicating whether the person is eligible to vote or not.	5M
	ii) Design a Python program that calculates the factorial of a given number using a while loop.	5M

OR

11. B).	Evaluate the use of decision structures in Python programming. Discuss the advantages and disadvantages of nested decision structures, with examples.	10M

12. A).	i) Write a Python program that demonstrates the use of conditional iteration to print all even numbers between 1 and 100. Include proper control flow and output formatting.	5M
	ii) Compare and contrast definite iteration with conditional iteration. Provide examples where each type of iteration is more suitable than the other.	5M

OR

12. B).	i) Implement a Python program that reads data from a file and performs a specific calculation on each record using loops.	5M
	ii) Analyze the advantages of using loops to process files over reading data directly without loops.	5M

(P.T.O..)

13. A). i) Analyze the benefits and drawbacks of using string methods in Python. Illustrate your points with relevant code snippets. 5M

ii) Create a function in Python that takes a set of integers as input and returns a new set containing only the prime numbers. 5M

OR

13. B). Compare the concept of lists and tuples with examples. 10M

14. A). Utilizing the concept of composition, design a class called "Student" that has a "Course" object as one of its attributes. Implement appropriate methods to add and drop courses, calculate the student's GPA, and display the course schedule. Demonstrate the usage of this class in a sample program. 10M

OR

14. B). Illustrate the concept of procedural and object-oriented programming. 10M

15. A). Compare and contrast the behavior of terminal-based programs and GUI-based programs, highlighting their similarities and differences. Provide examples to support your answer. 10M

OR

15. B). Design a GUI-based program using Tkinter that incorporates an info dialog box. Explain the purpose and functionality of the info dialog box within your program and provide code 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Introduction to Data Science
(Common for CE, ME & ECE)

Date: 03.12.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What are the traits of Big Data?	2 M
2.	What is the difference between Analysis and Reporting?	2 M
3.	What is web scraping?	2 M
4.	What does rescaling of data mean, and why is it important?	2 M
5.	What is the purpose of train/test splitting in machine learning?	2 M
6.	What is the difference between Lasso and Ridge regularization?	2 M
7.	How does Random Forest differ from a single decision tree?	2 M
8.	What is deep learning, and how does it differ from traditional machine learning?	2 M
9.	What types of data are used in stock market prediction?	2 M
10.	What are some common algorithms used for object recognition?	2 M

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

11.A). In what scenarios would you prefer using NumPy over a regular Python list, and why?   10M
Give examples.

OR

11. B). How does Web Scraping contribute to data collection for Data Science? List its   10M
advantages.

12. A). What are some common data manipulation techniques in Pandas, and how would you use   10M
them to clean or transform data? Give examples.

OR

12. B). Discuss about Bar chart, Line chart and Scatter plot with an example.   10M

13. A). Explain the following with example: 10M
    i) Supervised Learning
    ii) Unsupervised Learning
    iii) Reinforcement Learning

(P.T.O..)

OR

13. B). Explain the steps involved in determining the output class **'Stolen'** for the test data X=   10M
(Red, SUV, Domestic) using Naïve Bayes Classifier.

Color	Type	Origin	Stolen?
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

14. A). What is a Random Forest, and how does it improve upon decision trees? Discuss the steps   10N
involved in building a Random Forest.

OR

14. B). What is the difference between linear and nonlinear systems in time series analysis? How   10M
do you determine which type of model to apply?

15. A). What performance metrics used to evaluate weather forecasting models, and how do these   10M
metrics help in assessing model accuracy?

OR

15. B). How can object recognition algorithms be optimized for real-time applications such as   10M
autonomous vehicles?

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Environmental Protection and Management
(CSE)

Date: 03.12.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks. 10x2=20M

1.	What is environmental reduction?	2 M
2.	List the any two environmental policies on environment.	2 M
3.	What is the environmental quality objective?	2 M
4.	What is the concept of cleaner technology?	2 M
5.	What is difference between EMS and EMAS	2 M
6.	What is an example of an environmental management program?	2 M
7.	Define the term environmental audit.	2 M
8.	What is meant by waste audit?	2 M
9.	What are the harmful effects of sugar industry?	2 M
10.	What is the concept of transboundary movement?	2 M

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

11.A).	Describe the unique characteristics of environmental problems.	10M
	OR	
11. B).	Explain the charter on corporate responsibilities for environmental protection.	10M
12. A).	Explain the salient features of emission and ambient standards.	10M
	OR	
12. B).	Enumerate the opportunities and barriers in environmental management.	10M
13. A).	What is ISO? State the requirements and recommended approach to implementing of ISO 14000 with an organization.	10M
	OR	
13. B).	Discuss in training awareness and competence for an EMS.	10M
14. A).	Explain the environmental management system audit as per ISO 19011.	10M
	OR	
14. B).	Enumerate the content of Environmental Statement (Form V).	10M
15. A).	Briefly discuss the application of EMS and waste audit.	10M
	OR	
15. B).	Write a note on classification and characteristics of hazardous waste.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Air Pollution and Control

(Common for CSE, IT, CSD & CSM)

Date: 03.12.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   **10x2=20M**

1.	What are the instruments used to measure the radiant energy from the Sun?	2 M
2.	What is the greatest environmental evils in the world give examples.	2 M
3.	What is the equation for plume rise (Δh) from the stacks?	2 M
4.	What are the important secondary meteorological parameters that influence air pollution?	2 M
5.	What are the objective of Representative Air Pollution Sample?	2 M
6.	What is the Stoke's Law used in Air Pollution Sampling?	2 M
7.	What are the objectives of using Air Pollution Control Equipment?	2 M
8.	How do you determine the concentration of Gaseous Pollutants present in Air Pollution Samples?	2 M
9.	List the various control methods of air pollution.	2 M
10.	What are the various causes of radioactive fallout from testing of nuclear weapons?	2 M

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

11.A). (i) What are the useful guides to observe severity of health effects in human-beings?   5M

(ii) What are the different types of effects of air pollution noticed and measured?   5M

OR

11. B). Explain the following clearly: The experimental exposure of different types of animals   10M
under controlled conditions to various concentrations and dosages of air pollutants can not
give valuable information regarding the mode of action of pollutant and its effects.

12. A). With a neat sketch, draw the plume behavior.   10M

OR

12. B). With a neat sketch, explain the working of: 10M
(i) Wind Direction Recorder
(ii) Wind Speed Recorder.

13. A). A factory uses 3,50,000 *litres* of furnace oil per month. If one million litres of oil used   10M
per year, the particulate matter emitted is 4.5 tonnes per year. Calculate the height of
chimney required to be provided for safe dispersion of the pollutants. Assume 300
working days. [Consider Central Board for Prevention & Control of Water Pollution, New
Delhi]. Assume necessary data if required.
(i) Air Pollution Samples should be large enough to make the analysis possible. Why?
(ii) How do you eliminate the sources of error in Air Pollution Sampling?

(P.T.O..)

13. B). (i) What are the preliminary stages of Air Sampling and explain in detail. 5M

(ii) Explain the following clearly: The degree to which the air pollutants discharged from various sources concentrate in a particular area depends largely on the meteorological conditions. 5M

14. A). What are the different stages in the reduction or control of Air Pollution and explain in detail. 10M

OR

14. B). (i) What is the step-by-step process of removing particles using Electro-Static Precipitator (ESP)? 5M

(ii) Explain the following clearly: Air Pollution Control Devices are designed according to the nature of Air Pollutants such as Particulate Matter and Gaseous Emissions. 5M

15. A). Explain the following briefly: Dust Suppression Systems brings the State-of-the-Art Technology to difficult and costly task of controlling the dust at Manufacturing, Industrial and Agricultural Sites. 10M

OR

15. B). (i) What is the selection criteria of Dust Suppression Systems? 6M

(ii) Observe the following figure and identify the common Air Pollutants produced by the Industrial Processes: 4M
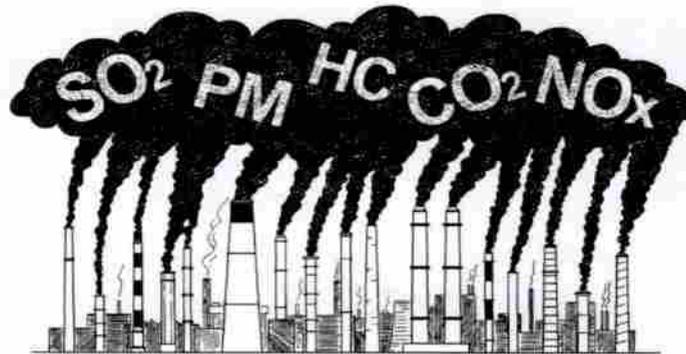
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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Business Ethics & Corporate Governance

(Information Technology)

Date: 03.12.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Summarize the characteristics of Business Ethics.	2 M
2.	Illustrate the Universal Code of Ethics.	2 M
3.	Outline the concept of Ethical Dilemmas.	2 M
4.	Demonstrate the role of Professional Ethics in an organization.	2 M
5.	Interpret how social media contributes to cyber terrorism.	2 M
6.	Classify the different dimensional aspects of Cyber Crimes.	2 M
7.	Illustrate how the Board evaluation contributes to effective governance.	2 M
8.	Name two mandatory Board Committees under Indian Corporate Governance norms.	2 M
9.	Relate how does Internal Control contribute to Risk Management in Corporate Governance?	2 M
10.	Write a note on history of Corporate Governance in India.	2 M

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

11.A). Build the sources of Business Ethics and their impact on the society.   10M

OR

11. B). Organize the significant levels of Moral Development proposed by Carol Gilligan.   10M

12. A). Discuss the need for implementing Professional Ethics in the Health Care Sector.   10M

OR

12. B). Identify the key factors of how Professional ethics play a pivotal role in shaping society by establishing standards of behavior that promote trust, accountability, and fairness across various sectors.   10M

13. A). Develop the role of intellectual property laws in cyberspace and the challenges of enforcement.   10M

OR

13. B). Identify the Psychology, Sociology and Skill sets of the Cyber criminals and explain in detail with examples.   10M

14. A). Illustrate the structure of the Board of Organization and their impact on the functioning of the organization.   10M

OR

14. B). Develop the challenges faced in implementing effective Corporate Governance in India and suggest measures to overcome the identified challenges.   10M

15. A). Construct the relationship between the Banks and Corporate Governance and how governance is critical in the effective functioning of the Indian banking sector.   10M

OR

15. B). Identify the salient features of OECD principles of Corporate Governance and explain with an example.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025
Course Name: Business Management & Financial Analysis
(Common for CSE, IT, CSC & CSM)

Date: 05.12.2025 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define management and state its characteristics.	2 M
2.	What are the main functions of management?	2 M
3.	Define Production Management.	2 M
4.	What is Marketing Mix?	2 M
5.	Define Managerial Economics.	2 M
6.	What is elasticity of demand?	2 M
7.	Define production function.	2 M
8.	What is break-even point?	2 M
9.	Define financial statement analysis.	2 M
10.	What is a Balance Sheet?	2 M

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

11.A).	Explain the functions of management in detail with suitable examples.	10M

OR

11. B).	Discuss the contributions of F.W. Taylor and Henry Fayol to management thought.	10M

12. A).	Explain various functions of Production Management.	10M

OR

12. B).	Describe recent trends in Marketing Management.	10M

13. A).	Explain the importance of business environment analysis for managers.	10M

OR

13. B).	Discuss various factors influencing demand with suitable examples.	10M

14. A).	Explain different types of cost concepts used in production.	10M

OR

14. B).	Derive the break-even analysis with diagram and explain its assumptions and limitations.	10M

15. A).	Explain various techniques of financial statement analysis.	10M

OR

15. B).	Discuss different profitability and activity ratios with examples.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech VII Semester Supplementary Examinations Nov/Dec-2025

Course Name: Cloud Computing
(Common for CE, EEE, ME, ECE, CSE, IT & CSC)

Date: 15.12.2025 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define Quantum Computing.	2 M
2.	What is High-Performance Computing (HPC)?	2 M
3.	What are the main characteristics of Cloud Computing?	2 M
4.	Outline the four cloud deployment models.	2 M
5.	What is Multitenancy in cloud computing?	2 M
6.	What is the difference between Vertical and Horizontal Scaling in cloud management?	2 M
7.	What does the term Infrastructure as a Service refer to?	2 M
8.	How does PaaS simplify application development?	2 M
9.	Explain briefly the various tools associated with Google Cloud Storage.	2 M
10.	What are the basic modules of EMC's Captiva Cloud Toolkit?	2 M

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

11.A). Explain the concepts of parallel and distributed computing and their key characteristics.   10M

OR

11. B). What are the reasons behind the shift from traditional on-premises computing to cloud computing? Provide justification for your response.   10M

12. A). Explain the cloud computing reference model with a neat diagram.   10M

OR

12. B). Discuss the need and motivation behind the adoption of Cloud Computing.   10M

13. A). Explain various approaches used for cloud migration.   10M

OR

13. B). Describe the concept of cloud architecture, detailing its components and functionalities.   10M

14. A). Explain the different cloud service models that have arisen since cloud computing was introduced.   10M

OR

14. B). Illustrate the Infrastructure-as-a-Service (IaaS) reference model with a clear diagram and explain its functionalities.   10M

15. A). Explain in detail about the overview of Aneka Platform.   10M

OR

15. B). Discuss in detail about Amazon Elastic compute cloud (EC2).   10M

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