17/11/2025

Course Code:**20CE7D11**

SC

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

REPAIR AND REHABILITATION OF STRUCTURES (CE)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Explain the patterns of cracking observed in concrete slabs, beams, and columns. (7M)

1.b) Discuss the mechanism of carbonation and its effect on the reinforcement corrosion process. (7M)

(OR)

1.c) Differentiate between abrasion, erosion, and pitting in concrete surfaces. (7M)

1.d) Explain the methods used for measuring crack width and depth in concrete. (7M)

UNIT-II

2.a) Explain the working principle of the Rebound Hammer Test for assessing the surface hardness of concrete. (7M)

2.b) Compare half-cell potential and resistivity methods in terms of principle, procedure, and interpretation. (7M)

(OR)

2.c) Discuss the advantages, limitations, and typical applications of the UPV method in evaluating concrete structures. (7M)

2.d) Discuss the different methods of corrosion measurement in concrete structures. (7M)

UNIT-III

3.a) Discuss the different causes of building failures. (7M)

3.b) Explain the techniques used to repair and prevent further crack formation. (7M)

(OR)

3.c) Discuss the importance of diagnostic testing in investigating structural failures. (7M)

3.d) Explain the role of accidental overloading and severe environmental events in the failure of structures. (7M)

UNIT-IV

4.a) Describe the chemical composition and mechanism of action of commonly used chemical admixtures in concrete repair applications. (7M)

4.b) Discuss different types of fibers and their contribution to strength and crack control. (7M)

(OR)

4.c) Describe the process and importance of visual investigation in the assessment of deteriorated concrete structures. (7M)

4.d) How is the depth of carbonation typically determined on-site, and why is this measurement important? (7M)

UNIT-V

5.a) Explain the shotcreting technique used for concrete repair and strengthening. (7M)

5.b) Define structural distress. Explain its causes and significance in the diagnosis and repair of concrete structures. (7M)

(OR)

5.c) Explain the rehabilitation process for heritage structures. Discuss the special challenges and materials used for preserving such structures. (7M)

5.d) Discuss a case study related to the rehabilitation of bridge piers. Explain the causes of damage, investigation procedure, and repair technique adopted. (7M)

*****

Course Code: **20EE7D08**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

GREEN ENERGY SOURCES (EEE)

Time: 3 hours | Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Describe the components of solar radiation received at the Earth's surface.	(7M)
1.b)	Explain the solar geometry briefly.	(7M)
	(OR)	
1.c)	Explain the variation of solar declination and its effect on solar radiation received at different latitudes.	(7M)
1.d)	Discuss the significance of solar radiation data in solar energy system design.	(7M)

UNIT-II

2.a)	Distinguish between a solar cell, module, and array with neat diagrams.	(4M)
2.b)	Explain the equivalent circuit model of a solar cell and draw its current–voltage and power –voltage characteristics.	(10M)
	(OR)	
2.c)	Derive the expression for efficiency of a solar cell and discuss the factors affecting it.	(7M)
2.d)	Explain the Hill Climbing MPPT technique and compare it with the P&O method.	(7M)

UNIT-III

3.a)	Compare and contrast Horizontal Axis Wind Turbines (HAWT) and Vertical Axis Wind Turbines (VAWT) in terms of design, working, advantages, and disadvantages.	(7M)
3.b)	Discuss the efficiency and power output of a wind turbine. Derive the expression including mechanical and generator efficiencies.	(7M)
	(OR)	
3.c)	What is the Betz limit? Derive the expression for the maximum power coefficient and state its significance in wind turbine design.	(10M)
3.d)	Describe horizontal axis wind turbines with neat diagrams and explain their applications.	(4M)

UNIT-IV

4.a)	Define pyrolysis. Describe the types of pyrolysis and the main products obtained from each type.	(7M)
4.b)	Classify different types of biogas digesters and explain them.	(7M)
	(OR)	
4.c)	Discuss the properties and applications of biochar, bio-oil, and syngas obtained from biomass pyrolysis.	(7M)
4.d)	Compare biomass energy with conventional fossil fuels in terms of renewability, carbon emissions, and energy efficiency.	(7M)

UNIT-V

5.a)	Describe the construction and working principle of a Lead-Acid battery.	(7M)
5.b)	List and explain the key technical characteristics of Lead-Acid batteries, including nominal voltage, energy density, cycle life, and operating temperature.	(7M)
	(OR)	
5.c)	A 12V, 100Ah Lead-Acid battery is used to power a 50A load. Calculate the approximate discharge time. Discuss the implications of deep discharge on battery life.	(7M)
5.d)	Describe the factors affecting the lifespan of Lead-Acid batteries and how proper maintenance can increase their cycle life.	(7M)

*****

Course Code: 20ME7D10

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B. Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

REFRIGIRATION & AIR-CONDITIONING (MECHANICAL)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Define refrigeration. State the Name of different types of system used for cooling of aircraft cabin.	(7M)
1.b)	Explain the Bell-Coleman cycle and derive the expression for COP of Bell-Coleman cycle.	(7M)
	(OR)	
1.c)	An air craft moving with speed of 1000 km/h uses simple gas refrigeration cycle for air conditioning. The ambient pressure and temperature are 0.35 bar and -10^{0}C respectively. The pressure ratio of compressor is 4.5. The heat exchanger effectiveness is 0.95. The isentropic efficiencies of compressor and expander are 0.8 each. The cabin pressure and temperature are 1.06 bar and 25^{0}C. Determine temperature and pressures at all points of the cycle. Also find the volume flow rate through compressor inlet and expander outlet for 100 TR. Take C_P=1.005 kJ/kg K; R=0.287 kJ/kg K and C_P/C_V=1.4 for air.	(7M)
1.d)	What are the factors to be considered while the refrigeration system for an aero plane? Explain briefly.	(7M)
	UNIT-II	
2.a)	State the effects of suction pressure and discharge pressure on performance of vapour compression system	(7M)
2.b)	A Two stage ammonia refrigeration system operates between overall pressure limits of 15 bar and 2 bar respectively. The liquid is sub-cooled to 30°C. The temperature of de-superheated vapour leaving the water intercooler is also 30°C. The flash chamber separates the dry vapour at 5 bar pressure. The liquid refrigerant then expands to 2 bar, the evaporator pressure. The load on the evaporator is 50 kW. Calculate i) Mass flow rate in different lines ii) Power required iii) COP	(7M)
	(OR)	
2.c)	Explain the working principle of simple vapour compression cycle with neat sketch and write the formula for COP.	(7M)
2.d)	Mention the advantages of vapour compression refrigeration system over air refrigeration system.	(7M)
	UNIT-III	
3.a)	Explain Ozone depleting potential and global warming potential.	(7M)
3.b)	State various evaporators in use. Compare Flooded and DX (dry expansion) type evaporators.	(7M)
	(OR)	
3.c)	What are the desirable properties of refrigerants? Explain.	(7M)
3.d)	Compare the performance of Reciprocating and Centrifugal compressors	(7M)
	UNIT-IV	
4.a)	Explain the working of Vortex tube refrigerator	(7M)
4.b)	Explain with the help of a neat sketch, the working of a steam jet refrigeration system.	(7M)
	(OR)	
4.c)	Explain the working principle of thermo-electric refrigeration system. Compare the	(7M)

	working of different components of thermo-electric refrigeration system with the working of different components of vapour compression system.	
4.d)	Draw a neat diagram of Ammonia water absorption system and explain its working in major field of applications of this system.	(7M)
	UNIT-V	
5.a)	Explain the difference between comfort air-conditioning and industrial air-conditioning.	(7M)
5.b)	Write short notes on Filters.	(7M)
	(OR)	
5.c)	Explain the use of heat pump for heating and cooling cycle with a neat diagram	(7M)
5.d)	Air from an air-conditioned room is exhausted into atmosphere through a grill. The quantity of air passes through the grill is 20 cubic meter minute. The duct area leading to the grill is 0.12 m^2. The static pressure behind the grill is 3 mm of water. Find the effective area of grill exhausting the air into atmosphere. Take the pressure loss passing through the grill as 0.5 mm of water.	(7M)

*****

Course Code: **20EC7D11**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV-2025

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (ECE)

Time: 3 hours | Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) State the differences between static and dynamic characteristics of an instrument. (7M)

1.b) Explain the working principles of series type and shunt type ohmmeters. (7M)

(OR)

1.c) Describe the types of errors in measurement and methods to minimize them. (7M)

1.d) Describe the construction and working of a thermocouple-type RF ammeter. (7M)

UNIT-II

2.a) Discuss the differences between analog and digital oscilloscopes highlighting their advantages and limitations. (7M)

2.b) Demonstrate, with the help of a neat diagram, how an AF oscillator can be used to generate a standard sine wave signal for testing an amplifier circuit. (7M)

(OR)

2.c) Explain how a harmonic distortion analyzer works and state its applications in signal analysis. (7M)

2.d) A sampling oscilloscope is used to measure a repetitive waveform of 10 MHz frequency. Analyze how the sampling rate and aliasing effect can influence the accuracy of the displayed waveform. (7M)

UNIT-III

3.a) Explain the working principle and construction of a Q-Meter and mention its applications in measuring quality factor and inductance. (7M)

3.b) A Wien Bridge is balanced at a frequency of 2 kHz. The resistors in the arms are $R_1 = R_2 = 10\ k\Omega$ and Calculate the capacitance C_1 & C_2 values required for balance and discuss how frequency can be varied using this bridge. (7M)

(OR)

3.c) Illustrate with a neat diagram the Anderson Bridge and explain how it is used for the measurement of self-inductance. (7M)

3.d) An Anderson Bridge has the following parameters: $R_1 = 100\ \Omega$, $R_2 = 200\ \Omega$, $R_3 = 300\ \Omega$, $R_4 = 400\ \Omega$, $C = 0.1\ \mu F$. Find the self-inductance (L) of the coil under test at the balance condition. (7M)

UNIT-IV

4.a) Explain with diagrams how a piezoelectric transducer can be used for measuring dynamic pressure. (7M)

4.b) Analyze the performance of active and passive transducers in terms of accuracy, linearity, and sensitivity for industrial measurement applications. (7M)

(OR)

4.c) A strain gauge with a gauge factor of 2 is mounted on a steel beam subjected to a strain of 0.0012. Calculate the percentage change in resistance of the strain gauge. (7M)

4.d) Explain how an LVDT (Linear Variable Differential Transformer) can be used to measure displacement. (7M)

UNIT-V

5.a) Analyze the performance of Hall effect and magneto-resistive sensors for use in high-temperature environments. (7M)

5.b) The velocity of sound in air is 343 m/s, and in water is 1480 m/s. Calculate the wavelength of a 5 kHz sound wave in both media and interpret the difference. (7M)

(OR)

5.c) Summarize how acoustic sensors detect sound intensity and frequency variations in different media. (7M)

5.d) Give the various forms of microphones. (7M)

*****

Course Code: 20CS7D09

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

CRYPTOGRAPHY AND NETWORK SECURITY
(CSE, CSE (AI&DS), AI&ML&CSE(AI&ML))

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Define security attack. Explain various types of attacks in detail.	(7M)
1.b)	Discuss the Symmetric Cipher Model with a neat diagram.	(7M)
	(OR)	
1.c)	Compare Substitution and Transposition techniques with examples.	(7M)
1.d)	Apply the mono-alphabetic substitution technique to convert the following plaintext into ciphertext. Plaintext: CRYPTOGRAPHY AND NETWORK SECURITY.	(7M)
	UNIT-II	
2.a)	Explain the design principles of block ciphers.	(7M)
2.b)	Explain the techniques involved for each round in DES with neat sketch.	(7M)
	(OR)	
2.c)	Explain the transformation functions and key expansion for each round in AES.	(7M)
2.d)	Explain DES algorithm with neat sketch.	(7M)
	UNIT-III	
3.a)	Explain Fermat's and Euler's theorems with examples.	(7M)
3.b)	Perform encryption and decryption using RSA for p=17, q=11, e=7, M=88	(7M)
	(OR)	
3.c)	Explain Diffie Hellman key exchange algorithm.	(7M)
3.d)	Explain the Chinese Remainder Theorem and its role in cryptography.	(7M)
	UNIT-IV	
4.a)	Explain the message authentication function.	(7M)
4.b)	Define cryptographic hash function. Explain its requirements and security properties.	(7M)
	(OR)	
4.c)	Explain the role of digital signatures in authentication and integrity.	(7M)
4.d)	Explain the NIST Digital Signature Algorithm.	(7M)
	UNIT-V	
5.a)	Explain in detail the operation of SSL	(7M)
5.b)	Write a short note on E-mail security.	(7M)
	(OR)	
5.c)	Explain the services provided by PGP	(7M)
5.d)	Give a brief note on IP security.	(7M)

****

Course Code: **20AD7D07**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV-2025
REINFORCEMENT LEARNING (CSE(AI&DS),AI&ML)

Time: 3 hours | Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Explain the key elements and structure of a Reinforcement Learning system with suitable examples.	(7M)
1.b)	Using an example, explain how the Tic-Tac-Toe problem can be modeled using reinforcement learning.	(7M)
	(OR)	
1.c)	Compare and contrast action-value methods and incremental implementation techniques in RL.	(7M)
1.d)	Explain the Gradient Bandit Algorithm and discuss how it differs from ε-greedy methods.	(7M)
	UNIT-II	
2.a)	Differentiate between episodic and continuing tasks in reinforcement learning.	(7M)
2.b)	Explain policy evaluation and policy improvement in dynamic programming.	(7M)
	(OR)	
2.c)	Write short notes on asynchronous dynamic programming.	(7M)
2.d)	Discuss the efficiency of dynamic programming and its limitations in large state spaces.	(7M)
	UNIT-III	
3.a)	Discuss the Monte Carlo estimation of action values with an example.	(7M)
3.b)	What is off-policy prediction in Monte Carlo methods? Explain importance sampling.	(7M)
	(OR)	
3.c)	Explain incremental implementation of Monte Carlo methods and its benefits.	(7M)
3.d)	Describe discounting-aware importance sampling and its role in RL.	(7M)
	UNIT-IV	
4.a)	What is semi-gradient TD learning? Explain its advantages and limitations.	(7M)
4.b)	Discuss the Deadly Triad problem in reinforcement learning and its implications.	(7M)
	(OR)	
4.c)	Compare True Online TD(λ) and Sarsa(λ) algorithms.	(7M)
4.d)	Describe Watkins's Q(λ) algorithm and its importance in off-policy learning.	(7M)
	UNIT-V	
5.a)	Explain the Policy Gradient Approach and its advantages over value-based methods.	(7M)
5.b)	Explain the challenges of policy optimization in continuing problems.	(7M)
	(OR)	
5.c)	Explain the challenges of policy optimization in continuing problems.	(7M)
5.d)	Discuss Samuel's Checkers Player as an early example of reinforcement learning success.	(7M)

*****

Course Code: **18EE7T15**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Supplementary Examinations (BR18), Nov - 2025

SIGNALS AND SYSTEMS (EEE)

Time: 3 hours Max. Marks: 60

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

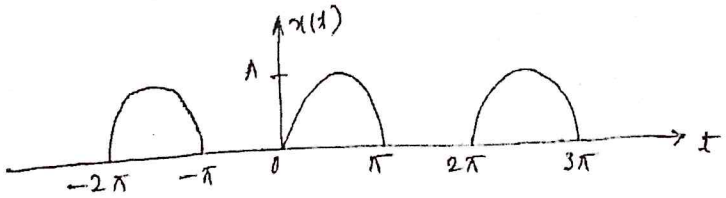
PART–A (6X2 = 12M)

1. a) Define the random signal. (2M)
   b) What is time shifting property of Fourier series? (2M)
   c) Explain about nyquist rate. (2M)
   d) Define causality of a filter. (2M)
   e) Find the laplace transform and ROC of x(t) = u(-t). (2M)
   f) State final value theorem of Z-transform. (2M)

PART–B (4X12 = 48M)

2. Define and Explain the following signal functions (12M)
   i) Unit step function ii) Unit impulse function
   iii) Unit ramp function iv) signum function.

3. Find the Fourier series expansion of the half wave rectified sine wave shown in figure below. (12M)



4.a) State and prove the sampling theorem for band limited signals. (6M)

   b) Explain the Natural sampling and Flat-top sampling. (6M)

5.a) Consider a stable LTI system characterized by the differential equation $\frac{dy(t)}{dt} + 2y(t) = x(t)$. Find its impulse response. (6M)

   b) What is impulse response? Show that the response of an LTI system is convolution integral of its impulse response with input signal? (6M)

6.a) List the properties of ROC for Laplace Transform. (6M)

   b) Define Laplace Transform of x(t) and its ROC. (6M)

7.a) Relate Z-transform with Fourier Transform and Laplace Transform (6M)

   b) Explain time-reversal and time scaling properties of Z-Transform. (6M)

*****

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), Nov 2025

BR20/BR18
19/11/25

(5)

ESTIMATION, COSTING AND VALUATION (CE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of **Part-A and Part-B.**
Answer any ***THREE*** questions from Part-A
Part B is compulsory

PART-A (3 X 14 = 42M)

1.a) Differentiate between detailed estimate and abstract estimate with examples. (7M)
1.b) Explain the purpose and importance of approximate estimates in civil engineering. (7M)

2.a) Define standard units of measurement. Why is standardization necessary in estimation? (7M)
2.b) Explain how deductions are made for openings in masonry and plastering while taking measurements. (7M)

3.a) Prepare an analysis of rates for cement mortar I class brick work in superstructure with 20*10*10 cm brick with **1:6** cement sand mortar (7M)
3.b) Prepare a rate analysis for 1 m^3 of reinforced cement concrete (RCC 1:2:4) in a column (7M)

4.a) What are overhead charges? Explain their types and significance. (7M)
4.b) How are transportation and storage costs accounted for in rate analysis? (7M)

5.a) Estimate the cost of earthwork for a portion of the road for a 400m length from the following data. R.L formation at the 21st station is 52.00. Consider a downward gradient of 1 in 200 (14M)

Station	21	22	23	24	25	26	27	28
Distance	140	180	220	260	300	340	380	420
R.L of ground	50.90	50.50	50.80	50.70	51.20	51.40	51.30	51.00

6.a) Differentiate between book value, market value, and salvage value with examples. (7M)
6.b) Write short notes on: (7M)
(a) Lump-sum contract
(b) Item-rate contract

PART – B (1 X 28 – 28M)

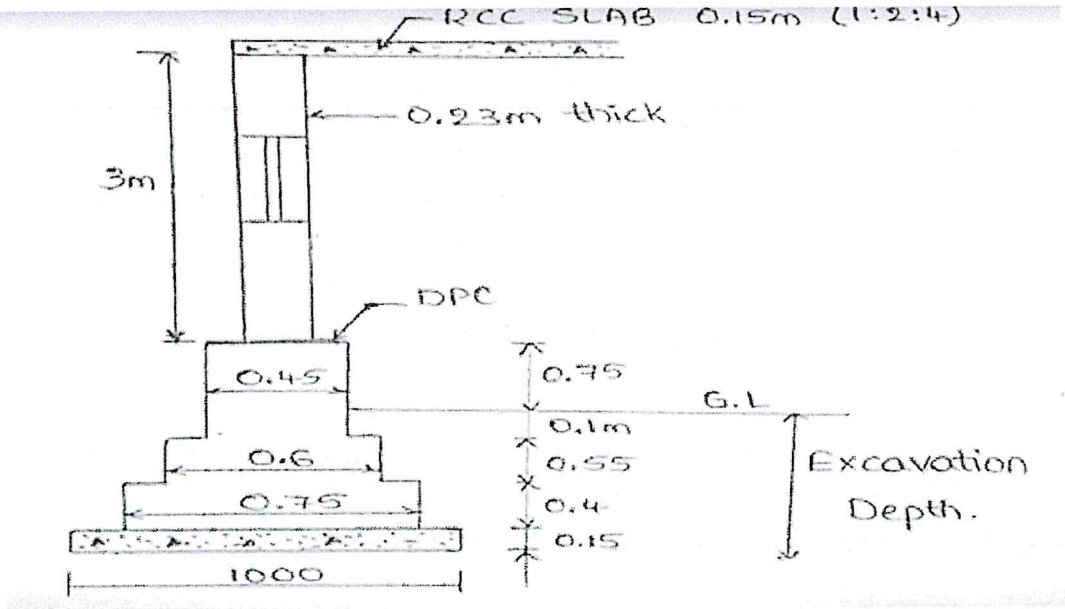
7 Estimate the quantities of the following items of a three roomed building from the given plan & section using long wall & short wall method. (28M)

(i) Earthwork in excavation in foundation

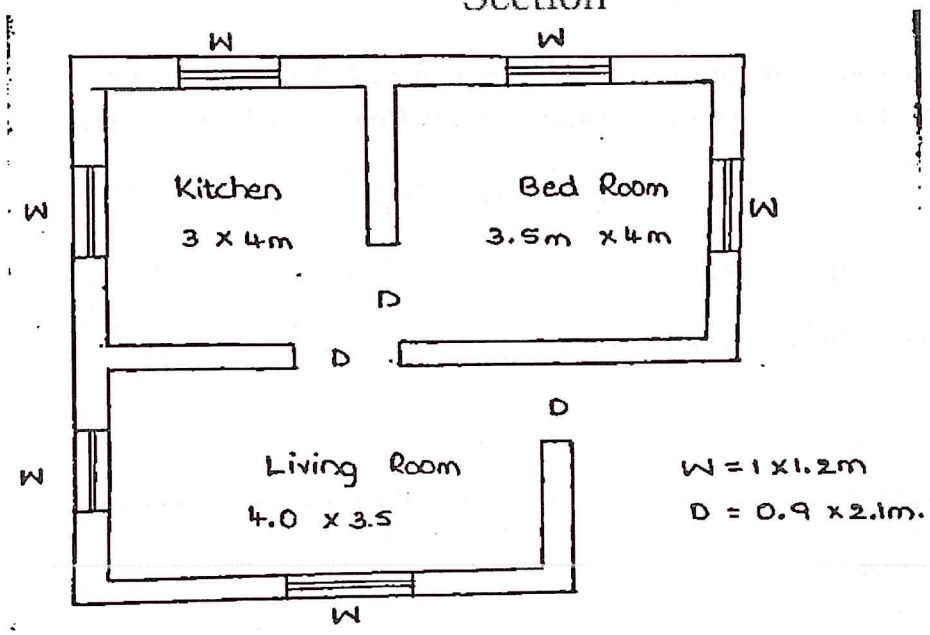
(ii) lime concrete in foundation

(iii)1st class brickwork in cement mortor 1:6 in foundation and plinth

(iv)Brickwork in super structure



Section



Plan

*****

Course Code: **20EE7D12**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B. Tech I-Semester Regular/Supplementary Examinations (BR20), NOV- 2025

UTILIZATION OF ELECTRICAL ENERGY (EEE)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	State the laws of illumination. Explain the laws with the help of suitable diagrams, and derive an equation of the same	(14M)
	(OR)	
1.c)	What do you understand by polar curves as applicable to light source Explain?	(7M)
1.d)	Define the terms: i)Illumination ii) Glare iii)Luminance iv) Luminous efficiency	(7M)
	UNIT-II	
2.a)	With the help of a neat diagram, explain the principal of operation of Incandescent lamp?	(7M)
2.b)	With a neat diagram, explain the construction and working of sodium vapour lamp.	(7M)
	(OR)	
2.c)	Explain the requirements of good lightning scheme.	(7M)
2.d)	Explain about flood lightning with suitable diagram.	(7M)
	UNIT-III	
3.a)	Describe briefly the methods of direct and indirect resistance heating and list the applications of these two methods?	(7M)
3.b)	Write in brief about the comparison between AC and DC Welding.	(7M)
	(OR)	
3.c)	Explain the process of resistance welding and discuss its types.	(7M)
3.d)	What are the advantages of coated electrodes in welding process?	(7M)
	UNIT-IV	
4.a)	With the help of quadrilateral speed curve derive an expression for maximum speed.	(7M)
4.b)	Draw and explain a typical speed–time curve for main line service and suburban service.	(7M)
	(OR)	
4.c)	Derive the equation of motion of a train and explain the factors affecting train movement.	(7M)
4.d)	Explain the different systems of track electrification and compare their advantages and disadvantages.	(7M)
	UNIT-V	
5.a)	Explain about specific energy consumption for given run.	(14M)
	(OR)	
5.c)	With the help of trapezoidal speed-time curve, derive an expression for the maximum speed and hence estimate the values of acceleration and retardation	(14M)

*****

Course Code: **20ME7D16**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
IV-B.Tech I-Semester Regular/Supply End Examinations (BR20), NOV-2025
Automobile Engineering (MECH)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Explain how a four wheel drive mechanism offers better power transmission in a automobile.	(7M)
1.b)	What are the main components of an automobile? Describe all of them briefly.	(7M)
	(OR)	
1.c)	Draw the layout of four-wheel drive and list its advantages and disadvantages.	(7M)
1.d)	Differentiate between sliding-mesh and constant-mesh.	(7M)
	UNIT-II	
2.a)	Compare rigid axle and independent suspension systems.	(7M)
2.b)	Define and explain the following terms: a)Kingpin inclination b)Toe-in and Toe-out	(7M)
	(OR)	
2.c)	Explain the construction and working of torsion bar and shock absorber.	(7M)
2.d)	Explain the principle of steering and Ackermann steering geometry with a neat sketch.	(7M)
	UNIT-III	
3.a)	Discuss the requirements and properties of brake fluid.	(7M)
3.b)	Explain the working of mechanical brake systems.	(7M)
	(OR)	
3.c)	Explain the working of oil pressure gauge and engine temperature indicator.	(7M)
3.d)	Describe the starting system and explain Bendix drive mechanism with a diagram.	(7M)
	UNIT-IV	
4.a)	Define hybrid vehicles and state the requirements of HVs and EVs.	(7M)
4.b)	Explain the architecture of hybrid electric vehicles with neat block diagrams.	(7M)
	(OR)	
4.c)	Differentiate between series, parallel, and series-parallel hybrid configurations.	(7M)
4.d)	Explain the construction and working of battery management systems (BMS).	(7M)
	UNIT-V	
5.a)	Explain the precautions during engine reassembly.	(7M)
5.b)	Write short notes on: a) Antilock braking system(ABS) b) Central locking and electric windows	(7M)
	(OR)	
5.c)	Describe the servicing procedure for: a) Cylinder head b)Connecting rod and piston assembly.	(7M)
5.d)	List and explain the safety systems used in modern automobiles.	(7M)

*****

Course Code: **20EC7D16**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

NETWORK SECURITY AND CRYPTOGRAPHY (ECE)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Define different security services and mechanisms with examples.	(7M)
1.b)	Explain the major security goals of cryptography.	(7M)
	(OR)	
1.c)	Discuss transposition ciphers and their working principle.	(7M)
1.d)	Explain the basic components of a cryptographic system with a neat diagram.	(7M)

UNIT-II

2.a)	Explain the structure and working of Simplified DES (S-DES) algorithm.	(7M)
2.b)	Describe key generation, encryption, and decryption processes in RSA.	(7M)
	(OR)	
2.c)	Explain the different block cipher modes of operation.	(7M)
2.d)	Explain the AES encryption process with a neat diagram.	(7M)

UNIT-III

3.a)	State and prove Euler's theorem with examples.	(7M)
3.b)	Detail explain the steps involved in DIFFIE HELLMAN key exchange algorithm.	(7M)
	(OR)	
3.c)	Define modular arithmetic and explain its basic properties with examples.	(7M)
3.d)	Discuss how CRT can improve the efficiency of modular computations.	(7M)

UNIT-IV

4.a)	What is data integrity? Explain its importance in network security with suitable examples.	(7M)
4.b)	Define message integrity and authentication. Explain how both are achieved in secure communication.	(7M)
	(OR)	
4.c)	Explain the steps involved in the Digital Signature Algorithm (DSA).	(7M)
4.d)	Describe the different phases of key management: key generation, distribution, storage, and revocation.	(7M)

UNIT-V

5.a)	What is transport layer security? Explain how SSL/TLS protocols provide secure communication.	(14M)
	(OR)	
5.c)	List and explain the PGP services and explain how PGP message generation is done with a neat diagram.	(14M)

*****

Course Code: 20CS7D13

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supply Examinations (BR20), Nov 2025

SOFTWARE TESTING METHODOLOGIES
(CSE, CSE (AI&DS), AI&ML and CSE(AI&ML))

Time: 3 hours | Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	What is path testing? Describe the key components of achievable paths.	(7M)
1.b)	Discuss the purpose of testing and the importance of testing dichotomies.	(7M)
	(OR)	
1.c)	Explain the concept of path sensitization and its significance	(7M)
1.d)	Explain the taxonomy of bugs and discuss the consequences of bugs with suitable examples	(7M)
	UNIT-II	
2.a)	Describe the basic concepts and steps involved in data flow testing.	(7M)
2.b)	Explain transaction flow testing with a neat example.	(7M)
	(OR)	
2.c)	What are transaction flows? Explain how transaction flow graphs help in identifying test paths	(7M)
2.d)	Illustrate how data flow testing is applied in real-time applications.	(7M)
	UNIT-III	
3.a)	Define testability. Explain the factors affecting domain testability.	(7M)
3.b)	Explain the difference between nice domains and ugly domains with example.	(7M)
	(OR)	
3.c)	What is domain testing? Explain the process of identifying domains and paths.	(7M)
3.d)	Differentiate between domain testability and software testability.	(7M)
	UNIT-IV	
4.a)	Explain the reduction procedure and how regular expressions help in detecting software anomalies.	(7M)
4.b)	Write short notes on KV charts and specifications used in logic-based testing.	(7M)
	(OR)	
4.c)	Describe the reduction procedure and its applications in path testing.	(7M)
4.d)	Define path products and path expressions. Explain their role in logic-based testing.	(7M)
	UNIT-V	
5.a)	Discuss various testability tips for state testing.	(7M)
5.b)	Describe the node reduction algorithm and its importance in graph-based testing.	(7M)
	(OR)	
5.c)	Explain graph matrices in software testing.	(7M)
5.d)	Explain the concept of building testing tools using graph theory.	(7M)

*****

19/11/25 BR18

Course Code: 18EE7T16

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
IV-B.Tech I-Semester Regular Examinations (BR18), NOV - 2025
POWER SYSTEM OPERATION AND CONTROL (EEE)

Time: 3 hours Max. Marks: 60

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	Define the terms the production costs, total efficiency and incremental rates with respect to thermal power plant.	(2M)
b)	What is the need of hydrothermal scheduling	(2M)
c)	What are the different constraints that can be placed on the unit commitment problem	(2M)
d)	What is the need of a fly-ball speed governor	(2M)
e)	What is the need of PI control of single area power system	(2M)
f)	State the Advantages and disadvantages of different types of compensating equipment for transmission systems	(2M)

PART–B (4X12 = 48M)

2.a)	Derive the coordination equation of economic load dispatch with out considering transmission line losses.	(6M)
b)	Derive transmission loss formula in terms of B- coefficients	(6M)
3.a)	Explain about hydro – thermal co-ordination with necessary equations.	(6M)
b)	Explain the solution technique for solving hydro thermal scheduling problem	(6M)
4.a)	State unit commitment also explains the necessity of unit commitment.	(6M)
b)	Explain the solution methods of unit commitment.	(6M)
5.	Develop the mathematical model of speed governing system for generating systems.	(12M)
6.	Explain the combined operation of LFC and economic dispatch control with block diagram.	(12M)
7.a)	Explain briefly about shunt and series compensation of transmission lines.	(6M)
b)	What is the importance of load compensation and explain its objectives in power system.	(6M)

****

(5)

21/11/2025

BR20/BR18

Course Code: **20CE7D17**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B. Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

IRRIGATION ENGINEERING (CE)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	What are the different types of irrigation? Discuss them in detail.	(7M)
1.b)	Find the delta for a crop if the following details are given as Duty at the water course : 1800 hectares per cumec Base period for the crop : 130 days	(7M)
	(OR)	
1.c)	The discharge available from a tube well is 125 m^3/hour. Assume 3300 hours of working for a tube-well in a year, estimate the cultivable area that this tube-well can command. The intensity of irrigation is 55% and the average depth of Rabi and Kharif crops is 50cm.	(7M)
1.d)	Discuss different methods of application of irrigation water	(7M)
	UNIT-II	
2.a)	What is canal lining? What are its advantages? Write the requirements of good lining material?	(7M)
2.b)	What do you understand by balancing depth? Derive an expression for the same.	(7M)
	(OR)	
2.c)	The slope of a channel in alluvial soil is 1/6000. Find the channel section and the maximum discharge which can be allowed to flow in it. Take Lacey's silt factor f=1.2. The channel is of trapezoidal section, having side slopes ½:1	(7M)
2.d)	Define maximum permissible velocity and explain its importance in canal design.	(7M)
	UNIT-III	
3.a)	What is a regulator? Differentiate between head regulator and cross regulator.	(7M)
3.b)	Explain the Bligh's theory of design of weirs on permeable foundations. How is it different from Khosla's theory?	(7M)
	(OR)	
3.c)	Explain the design principles of a Sarda type fall with a neat sketch.	(7M)
3.d)	List different types of canal outlets and discuss them.	(7M)
	UNIT-IV	
4.a)	What do you understand by the elementary profile of a gravity dam? Derive expressions for determining base width of such a dam based on (i) stress criterion and (ii) sliding criterion	(7M)
4.b)	Define reservoir yield. Describe the different methods used for determining the yield of a reservoir.	(7M)
	(OR)	
4.c)	What is reservoir sedimentation? Explain the causes, effects, and methods of controlling sedimentation in reservoirs.	(7M)
4.d)	List and explain the forces acting on a gravity dam with a neat diagram.	(7M)

	UNIT-V	
5.a)	Explain the method of locating centre of the critical slip circle of stability analysis of the slope of an earth dam.	(7M)
5.b)	Discuss the classification of earth dams with neat sketches bringing out their relative merits and demerits.	(7M)
	(OR)	
5.c)	A discharge of 2000 cumecs has to be passed over an ogee spillway. With a coefficient of discharge of 2.3 at a head of 5.5 m. what should be the effective length of the spill-way. Neglect the velocity of approach.	(7M)
5.d)	Classify various types of spillways and explain any two spillways.	(7M)

*****

Course Code: **20EE7D16**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

SWITCHGEAR AND PROTECTION (EEE)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Describe the operation of SF6 circuit breaker with diagram and list out its merits and demerits. (7M)

1.b) Discuss in detail about low resistance arc interruption method. (7M)

(OR)

1.c) Derive the relation for rate of rise of restriking voltage. (7M)

1.d) In a 220 kv system, the reactance and capacitance up to the location of circuit breaker is 8 ohms and .025μf respectively a resistance of 700 ohms is connected across the contacts of the circuit breaker. Determine i) natural frequency of oscillation . ii) damped frequemcy of oscillation. (7M)

UNIT-II

2.a) What is an IDMT relay? Explain how this is achieved in practice. (14M)

(OR)

2.c) Explain the principle of operation of balanced beam type attracted armature relay. (7M)

2.d) What is impedance relay? Explain its operating principle. (7M)

UNIT-III

3.a) Explain the principle of Mertz-Price system of protection used for power Transformers. (7M)

3.b) An 11 kV, 100 MVA generator is provided with differential scheme of protection. The percentage of the generator winding to be protected against phase to ground fault is 80%. The relay is set to operate when there is 15% out of balance current. Determine the value of the resistance to be placed in the neutral to ground connection. (7M)

(OR)

3.c) What is Buchholz relay? Which equipment is protected by it? For what types of faults is it employed? Discuss its working principle. (14M)

UNIT-IV

4.a) Explain any two Static Relay Components. (7M)

4.b) Establish duality between amplitude and phase comparators. (7M)

(OR)

4.c) With a neat block diagram explain the operation of Micro-processed based digital relay. (7M)

4.d) Explain in detail about static relay and its components. (7M)

UNIT-V

5.a) What are BILS? Explain their significance in power system studies. (7M)

5.b) Discuss in detail about the specifications of surge arresters. (7M)

(OR)

5.c) What are the basic requirements of surge arresters? Differentiate between a surge absorber and a sure arrester. (14M)

*****

Course Code: 20ME7D22

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

RENEWABLE ENERGY SOURCES (ME)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Explain the following terms w.r.t Solar radiation geometry: (i) Angle of latitude (ii) (iii) (iv) Declination angle Zenith Angle Hour angle	(7M)
1.b)	Classify the solar collectors and explain the flat plate collector with neat sketch.	(7M)
	(OR)	
1.c)	Explain in detail about the Solar cell with I-V & P-V characteristics.	(7M)
1.d)	Calculate the angle of incidence on a horizontal plane surface at Kolkata, at 14:00 hrs (IST), on March 21, in a leap year. The longitude and latitude of Kolkata are 88° 20'E and 22° 32'N respectively. The standard longitude of IST is 81° 44'E.	(7M)
	UNIT-II	
2.a)	What is wind mill and classify different wind mills. With neat sketch explain the Horizontal Axis Wind mill.	(14M)
	(OR)	
2.c)	What are the main advantages in use of biogas? What are its main constituents and explain them?	(7M)
2.d)	What is photosynthesis and how it is related to biomass	(7M)
	UNIT-III	
3.a)	Describe all the types of geo-thermal resources with their applications.	(7M)
3.b)	What are the main advantages and disadvantages of OTEC system? And explain the various technologies available for OTEC.	(7M)
	(OR)	
3.c)	Evaluate the environmental aspects of geothermal energy in detail	(7M)
3.d)	Discuss different OTEC projects in India detail.	(7M)
	UNIT-IV	
4.a)	Discuss about Thermo-Electric Generators.	(7M)
4.b)	Explain the various characteristics of Fuel cell.	(7M)
	(OR)	
4.c)	Give the classification of Fuel Cells based on: (i) the type of electrolyte (ii) the types of fuel and oxidant and (iii) operating temperature.	(7M)
4.d)	Explain the various energy extraction technologies used with different materials. Also list applications.	(7M)
	UNIT-V	
5.a)	Explain the storage and applications of Hydrogen.	(7M)
5.b)	Explain the operation of proton-exchange membrane fuel cell (PMFC) with a neat diagram.	(7M)
	(OR)	
5.c)	Discuss various production methods available for Hydrogen production. Why Hydrogen fuel is used in Automobile sector?	(14M)

*****

Course Code: 20ME7D19

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Supplementary Examinations (BR20), NOV - 2025

FARM MACHINERY (ME)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Write about the status of Farm Mechanization in India?	(7M)
1.b)	Explain in briefly about the heat treatment of steel.	(7M)
	(OR)	
1.c)	What do you mean by depreciation? Explain about different methods for estimation of depreciation of farm machinery.	(7M)
1.d)	Explain about objectives of farm mechanization and classification of farm machines	(7M)
	UNIT-II	
2.a)	Explain in briefly about classification and types of tillage.	(7M)
2.b)	A plot of 1000X800 m is to be drilled by a corn planter. The planter is having 6 rows with spacing of 120 cm. The speed of travel of planting is 5 kmph. Assume that the time lost in each turn is 10s and time lost in filling the seed hopper is 10 min per hectare. Take an overlap of 15 cm in each run. Find the field efficiency of the machine.	(7M)
	(OR)	
2.c)	Explain forces acting upon tillage implement with neat sketch.	(7M)
2.d)	Enumerate the benefits of Primary tillage operation.	(7M)
	UNIT-III	
3.a)	What are the different types of metering mechanisms for precision planting? Explain them.	(7M)
3.b)	Discuss briefly about any two types of furrow openers with the help of diagrams.	(7M)
	(OR)	
3.c)	What are different methods of sowing crops? Explain	(7M)
3.d)	Define calibration of seed drill? Explain with neat sketch.	(7M)
	UNIT-IV	
4.a)	Explain in briefly about fertilizer metering mechanism	(7M)
4.b)	What are the regular national tests conducted on agricultural machinery?	(7M)
	(OR)	
4.c)	What are the functions of sprayers? Explain briefly with suitable applications.	(7M)
4.d)	What are the different types of metering mechanisms for precision planting? Explain them.	(7M)
	UNIT-V	
5.a)	Describe the common problems faced in aqua farming and suggest remedial measures.	(7M)
5.b)	Write short notes on soil and water quality parameters essential for aqua farming.	(7M)
	(OR)	
5.c)	Explain in detail the types of aerators used in aqua farming and their working principles.	(7M)
5.d)	Explain the methods to improve and maintain soil and water quality in aqua ponds.	(7M)

****

Course Code: 20EC7D18

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV-2025
WIRELESS SENSOR NETWORKS (ECE)

Time: 3 hours

Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Discuss the advantages and applications of sensor networks.	(7M)
1.b)	List and explain various hardware components of sensor node.	(7M)
	(OR)	
1.c)	Define wireless sensor networks and explain the challenges while designing the wireless sensor networks.	(7M)
1.d)	Discuss in detail the energy consumption of sensor nodes.	(7M)
	UNIT-II	
2.a)	Define hidden and exposed nodes of a network. Explain with diagrams.	(7M)
2.b)	Explain in brief about the topology of MANETs.	(7M)
	(OR)	
2.c)	Write about dynamic modulation scaling and antenna considerations in wireless sensor networks.	(7M)
2.d)	Compare the topologies of PAN and WANETs.	(7M)
	UNIT-III	
3.a)	What are the design goals of a MAC protocol for ad hoc wireless networks?	(7M)
3.b)	List and explain any one of the contention based MAC protocols with reservation mechanism.	(7M)
	(OR)	
3.c)	Discuss the steps in MACAW protocol.	(7M)
3.d)	What is the principle behind scheduled based protocol? Explain any one of the schedule based protocols.	(7M)
	UNIT-IV	
4.a)	Discuss the issues in designing a routing protocol for ad hoc wireless networks.	(7M)
4.b)	Summarize the steps in zone routing protocol.	(7M)
	(OR)	
4.c)	Explain about hierarchical routing protocols.	(7M)
4.d)	Compare table–driven and on-demand routing protocols.	(7M)
	UNIT-V	
5.a)	Discuss various asymmetric key algorithms of ad hoc wireless networks.	(7M)
5.b)	Write short notes on Home Automation.	(7M)
	(OR)	
5.c)	Give the classification of the different types of attacks possible in ad hoc wireless networks and explain them.	(7M)
5.d)	Write short notes on wireless fidelity system.	(7M)

*****

Course Code: **20CS7D17**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

MOBILE COMPUTING (CSE)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a)	Draw and explain the architecture of a GSM system.	(7M)
1.b)	What are mobile and handheld devices? Explain its main features with examples.	(7M)
	(OR)	
1.c)	What is radio interface? Explain how frequencies are used in GSM.	(7M)
1.d)	What is handover in GSM? Explain its types.	(7M)

UNIT-II

2.a)	Define exposed terminal problem? Explain how it reduces network performance?	(7M)
2.b)	Briefly explain about TDMA.	(7M)
	(OR)	
2.c)	Write a short note on CDMA.	(7M)
2.d)	List and explain the main features of IEEE 802.11.	(7M)

UNIT-III

3.a)	Explain different handover methods in communication.	(7M)
3.b)	Describe the registration process in Mobile IP.	(7M)
	(OR)	
3.c)	Describe packet delivery process in Mobile IP.	(7M)
3.d)	What is Encapsulation in Mobile IP? Explain their types.	(7M)

UNIT-IV

4.a)	What is Snooping TCP? Explain how it helps in handling packet loss in mobile networks.	(7M)
4.b)	Explain how client-server computing work in mobile environments.	(7M)
	(OR)	
4.c)	Describe how query processing performed in mobile database systems.	(7M)
4.d)	What is database hoarding? Explain its importance in mobile computing.	(7M)

UNIT-V

5.a)	Describe various data dissemination methods in wireless networks.	(7M)
5.b)	Give a brief note on data synchronization in mobile networks and its importance.	(7M)
	(OR)	
5.c)	What is selective tuning? Explain how it saves device power.	(7M)
5.d)	Explain how indexing methods help mobile devices efficiently to retrieve data.	(7M)

*****

Course Code: 20AD7D14

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV-2025
AI CHATBOTS (CSE(AI & DS), AI&ML, CSE(AI & ML))

Time: 3 hours | Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Summarize ethical considerations in chatbot deployment.	(7M)
1.b)	Elaborate on the importance of personal data management in chatbot development.	(7M)
	(OR)	
1.c)	Explain GDPR and discuss its implications on chatbot data privacy.	(7M)
1.d)	Analyze how data from chatbot conversations can be used for training and performance improvement.	(7M)
	UNIT-II	
2.a)	Compare the rule-based and AI-based chatbot approaches.	(7M)
2.b)	Elaborate on how multiple communication channels affect chatbot design.	(7M)
	(OR)	
2.c)	Discuss the process of developing customer service-centric chatbots.	(7M)
2.d)	Explain the major Chabot development approaches with examples.	(7M)
	UNIT-III	
3.a)	Describe various success metrics used to evaluate chatbot performance.	(7M)
3.b)	Analyze the risks associated with chatbot services and suggest management strategies.	(7M)
	(OR)	
3.c)	Illustrate the components of a generic solution architecture for private chatbots.	(7M)
3.d)	Explain the key business factors that influence chatbot solution design.	(7M)
	UNIT-IV	
4.a)	Describe the workflow of Natural Language Processing in understanding user input.	(7M)
4.b)	Demonstrate the architecture of an NLP-enabled chatbot.	(7M)
	(OR)	
4.c)	Discuss practical applications of NLP and NLU in business chatbots.	(7M)
4.d)	Compare different open-source NLP and NLU tools.	(7M)
	UNIT-V	
5.a)	Compare RASA, RASA core, RASA NLU.	(7M)
5.b)	Analyze the role of Google Dialogflow in developing conversational agents and discuss its integration capabilities.	(7M)
	(OR)	
5.c)	Discuss the core features of the Microsoft Bot Framework in building intelligent conversational agents.	(7M)
5.d)	Discuss the process of integrating chatbots with third-party APIs and enterprise data stores through integration modules.	(7M)

*****

Course Code: 20AD7D15

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV -B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

Data Visualization-CSE (AI&DS) & AI&ML

Time: 3 hours | Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Illustrate the role of colour scales in distinguishing and highlighting data in charts	(7M)
1.b)	Implement a directory mapping that suggests suitable visualizations for distributions and geospatial data	(7M)
	(OR)	
1.c)	Discuss why mapping data values to aesthetics is important for accurate interpretation	(7M)
1.d)	Utilize coordinate systems with curved axes to solve a visual mapping problem for circular data.	(7M)
	UNIT-II	
2.a)	Why are grouped and stacked bar charts preferred for comparing amounts across multiple categories?	(7M)
2.b)	How do quantile plots assist analysts in identifying and understanding skewed distributions within data?	(7M)
	(OR)	
2.c)	Implement a visualization using dot plots and histograms to compare multiple distributions.	(7M)
2.d)	Create density plots for given data and interpret their meaning regarding the population sampled.	(7M)
	UNIT-III	
3.a)	In what ways does time series visualization assist in identifying and interpreting trends in data?	(7M)
3.b)	Plot multiple time series on a single axis to compare trends in different variables over time	(7M)
	(OR)	
3.c)	Discuss the benefits of using parallel sets to show related categories in a dataset.	(7M)
3.d)	Implement correlograms to analyze and visualize relationship patterns in multi-variable data.	(7M)
	UNIT-IV	
4.a)	Illustrate common methods for framing probabilities as frequencies in uncertainty visualization.	(7M)
4.b)	Visualize curve fits and show uncertainty bands for regression analysis results	(7M)
	(OR)	
4.c)	Discuss de-trending and time-series decomposition for uncovering underlying data patterns	(7M)
4.d)	How might cartograms be designed to visually communicate quantities related to specific geographic locations?	(7M)
	UNIT-V	
5.a)	Illustrate common pitfalls in colour usage for encoding too much or irrelevant information	(7M)
5.b)	Discuss methods for handling overlapping points using partial transparency and jittering.	(7M)

	(OR)	
5.c)	Implement design modifications to accommodate colour-vision deficiency in visualization tasks	(7M)
5.d)	Critically evaluate visualization for proportional ink principles and redesign to improve clarity.	(7M)

*****

Course Code: **18EE7T17**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV- B. Tech I-Semester Regular Examinations (BR18), November-2025

SWITCHGEAR AND PROTECTION

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 60

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A***
*Answer any **FOUR** Questions from **Part-B***

PART–A (6X2 = 12M)

1. a)	How does arc interruption takes place in a circuit breaker?	(2M)
b)	How are relays classified based on their operating characteristics?	(2M)
c)	What are inter-turn faults in an alternator and how do they occur?	(2M)
d)	What does three-zone protection mean in the context of power system protection?	(2M)
e)	Write any two advantages of microprocessor based relays.	(2M)
f)	How are over-voltages generated in power systems?	(2M)

PART–B (4X12 = 48M)

2.a)	Write the operation of oil circuit breaker with neat diagram also Lists its advantages and disadvantages?	(6M)
b)	What are the causes and effects of restriking voltage? Explain.	(6M)
3.a)	Explain the balanced beam type attracted armature relay with a neat diagram.	(6M)
b)	Explain the principle of operation of non directional cup relay with neat diagram.	(6M)
4.a)	A star connected 3-phase, 10MVA, 6.6KV alternator has a per phase reactance of 10% it is protected by Mertz-price scheme which is set operate for fault current less than 175A. Calculate the value of earthing resistance provided in order to ensure that only 10% of alternator winding is unprotected.	(6M)
b)	What are the various protective schemes used to safeguard an alternator from stator and rotor overheating?	(6M)
5.a)	With neat schematic diagram and explain the Carrier current protection	(6M)
b)	Describe the importance and use of PSM and TSM for the over current relays.	(6M)
6.a)	Draw and explain the characteristics of static impedance and static mho relays.	(6M)
b)	Explain the merits of microprocessor- based relaying schemes	(6M)
7.a)	What are the various methods of neutral grounding? Explain each of them in brief?	(6M)
b)	Discuss the construction and principle of working of any one type of lightning arrester	(6M)

****

(5) 28/11/2025 (BR20)

Course Code: 20HS7E03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

MANAGEMENT SCIENCE

(CE, EEE, ECE, CSE, CSE (AI&DS), AI&ML,CSE(AI&ML))

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Define Management. Explain the nature and importance of Management.	(7M)
1.b)	Explain Herzberg theories of motivation.	(7M)
	(OR)	
1.c)	Explain about Formal and Informal organization.	(7M)
1.d)	Write about different types of Organizational Structures.	(7M)
	UNIT-II	
2.a)	Define Plant Location and Explain factors influencing Plant location.	(7M)
2.b)	What is ABC analysis and explain different types of ABC analysis.	(7M)
	(OR)	
2.c)	What is Plant Layout? Discuss different types of Plant Layout.	(7M)
2.d)	Explain about TQM,JIT,KPO.	(7M)
	UNIT-III	
3.a)	What is the concept of HRM ? Explain its Functions.	(7M)
3.b)	Define Market Segmentation. Explain different types of Segmentation?	(7M)
	(OR)	
3.c)	Define Marketing Mix and Explain.	(7M)
3.d)	Explain various channels of Distribution?	(7M)
	UNIT-IV	
4.a)	Explain the characteristics of CPM and its role in project network and in project crashing.	(7M)
4.b)	Compare and contrast between PERT and CPM?	(7M)
	(OR)	
4.c)	What are the Rules to be satisfied for the identification of Critical path? Explain.	(7M)
4.d)	Explain about different Network drawing Rules.	(7M)
	UNIT-V	
5.a)	What is Mission? What are the characteristics of a mission statement?	(7M)
5.b)	Explain different components of SWOT analysis.	(7M)
	(OR)	
5.c)	What is corporate strategy Planning Process? Why this is important for long term success of any business Organization?	(7M)
5.d)	Explain SWOT analysis. Analyse how SWOT analysis can be used for Business.	(7M)

*****

Course Code: **20HS7E01**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU
(AUTONOMOUS)
IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV-2025
RESOURCE MANAGEMENT (ME)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

UNIT-I

1.a) Define Resource Management and explain its key components. (7M)
1.b) Discuss the importance of effective Resource Management in business organizations. (7M)

(OR)

1.c) Define Environmental Scanning and explain its significance in resource management. (7M)
1.d) What is a Strategic Advantage Profile (SAP)? Explain its role in Resource Management. (7M)

UNIT-II

2.a) Discuss the importance of HRM in achieving organizational effectiveness. (7M)
2.b) What is Human Resource Planning and explain its process. (7M)

(OR)

2.c) Explain the concept of Job Evaluation and its importance in determining fair compensation. (7M)
2.d) What are Channels of Distribution? Describe the types and functions of marketing channels. (7M)

UNIT-III

3.a) Define Materials Management and explain its objectives and scope in organizations. (7M)
3.b) Define Economic Order Quantity (EOQ). Explain its concept, assumptions, and formula. (7M)

(OR)

3.c) Explain the ABC analysis method and its significance in inventory control. (7M)
3.d) Explain the concept of Just-In-Time (JIT) and its advantages in material management. (7M)

UNIT-IV

4.a) Define Work Study and explain its purpose and components. (7M)
4.b) Describe the tools and techniques used in method study. (7M)

(OR)

4.c) Define Acceptance Sampling and explain its concept and purpose in quality control. (7M)
4.d) Discuss the types of control charts(C-chart, and P-chart) used in SQC. (7M)

UNIT-V

5.a) Define Project Management and explain its objectives and scope. (4M)
5.b) A small project consists of the activities whose precedence relationship is given below: (10M)

Activity	A	B	C	D	E	F	G	H	I	J
Predecessor	-	-	A	A	B,C	B,C	E	E	D,H	F,G,I
Duration	15	15	3	5	8	12	1	14	3	14

(i) Draw the network (ii) Estimate EST and LFT (iii) Determine the critical path and time of project completion Time (iv) find floats for all activities.

(OR)

5.c) Explain how three time estimates (optimistic, most likely, pessimistic) are used in PERT (4M)

5.d) The following table lists the jobs of a network along with their time estimates (10M] 6]

	Duration(days)		
Job	T_o	T_m	T_p
1-2	3	6	15
1-6	2	5	14
2-3	6	12	30
2-4	2	5	8
3-5	5	11	17
4-5	3	6	15
5-8	1	4	7
6-7	3	9	27
7-8	4	19	28

(a) Draw the project network

(b) Calculate the length and variance of the critical path

(c) What is the probability that the jobs on the critical path will be completed in 41 days?

*****

Course Code: **20CS7E04**

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

IV-B. Tech I-Semester Regular/Supplementary Examinations (BR20), NOV- 2025

NATURE INSPIRED COMPUTING TECHNIQUES

(ECE, CSE, CSE(AI&DS) & AI&ML)

Time: 3 hours

Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Discuss about any four nature inspired computing algorithms in brief.	(7M)
1.b)	Explain about analysis of optimization algorithms.	(7M)
	(OR)	
1.c)	Write a brief notes on parameter tunning and parameter control.	(7M)
1.d)	Explain different types of parameter control methods — static, dynamic, and adaptive.	(7M)
	UNIT-II	
2.a)	Explain the role of selection, crossover, and mutation operators in Genetic Algorithms.	(7M)
2.b)	Differentiate between binary PSO and accelerated PSO.	(7M)
	(OR)	
2.c)	Explain about the role of genetic operators and choice of parameters.	(7M)
2.d)	Discuss the role of inertia weight, cognitive component, and social component in PSO.	(7M)
	UNIT-III	
3.a)	Briefly explain about Firefly algorithm.	(7M)
3.b)	Discuss the effect of different attractiveness functions on convergence performance.	(7M)
	(OR)	
3.c)	Compare the Firefly Algorithm with other metaheuristic algorithms such as PSO and GA.	(7M)
3.d)	Describe the working steps of the standard Cuckoo Search algorithm.	(7M)
	UNIT-IV	
4.a)	Discuss about Bat Algorithm in engineering design and explain acoustic echo location behaviour of Bat Algorithm.	(7M)
4.b)	Explain the different variants of Bat Algorithm (e.g., Improved BA, Chaotic BA).	(7M)
	(OR)	
4.c)	What are the key variants of the Bat Algorithm? Briefly explain any two.	(7M)
4.d)	Discuss the advantages of Bat Algorithm in data mining and feature selection tasks.	(7M)
	UNIT-V	
5.a)	What is the inspiration behind the Flower Pollination Algorithm?	(7M)
5.b)	Describe the mathematical formulation of global and local pollination processes.	(7M)
	(OR)	
5.c)	Discuss how MOFPA handles multiple conflicting objectives in optimization problems.	(7M)
5.d)	Explain how randomization, switch probability, and Levy flight affect FPA's global optimization performance.	(7M)

*****

Course Code: 20CS7E04

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE: ODALAREVU
(AUTONOMOUS)

IV-B. Tech I-Semester Regular/Supplementary Examinations (BR20), NOV- 2025

NATURE INSPIRED COMPUTING TECHNIQUES

(ECE, CSE, CSE(AI&DS) & AI&ML)

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Discuss about any four nature inspired computing algorithms in brief.	(7M)
1.b)	Explain about analysis of optimization algorithms.	(7M)
	(OR)	
1.c)	Write a brief notes on parameter tunning and parameter control.	(7M)
1.d)	Explain different types of parameter control methods — static, dynamic, and adaptive.	(7M)
	UNIT-II	
2.a)	Explain the role of selection, crossover, and mutation operators in Genetic Algorithms.	(7M)
2.b)	Differentiate between binary PSO and accelerated PSO.	(7M)
	(OR)	
2.c)	Explain about the role of genetic operators and choice of parameters.	(7M)
2.d)	Discuss the role of inertia weight, cognitive component, and social component in PSO.	(7M)
	UNIT-III	
3.a)	Briefly explain about Firefly algorithm.	(7M)
3.b)	Discuss the effect of different attractiveness functions on convergence performance.	(7M)
	(OR)	
3.c)	Compare the Firefly Algorithm with other metaheuristic algorithms such as PSO and GA.	(7M)
3.d)	Describe the working steps of the standard Cuckoo Search algorithm.	(7M)
	UNIT-IV	
4.a)	Discuss about Bat Algorithm in engineering design and explain acoustic echo location behaviour of Bat Algorithm.	(7M)
4.b)	Explain the different variants of Bat Algorithm (e.g., Improved BA, Chaotic BA).	(7M)
	(OR)	
4.c)	What are the key variants of the Bat Algorithm? Briefly explain any two.	(7M)
4.d)	Discuss the advantages of Bat Algorithm in data mining and feature selection tasks.	(7M)
	UNIT-V	
5.a)	What is the inspiration behind the Flower Pollination Algorithm?	(7M)
5.b)	Describe the mathematical formulation of global and local pollination processes.	(7M)
	(OR)	
5.c)	Discuss how MOFPA handles multiple conflicting objectives in optimization problems.	(7M)
5.d)	Explain how randomization, switch probability, and Levy flight affect FPA's global optimization performance.	(7M)

*****

Course Code: 20CE7E03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU

(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

DISASTER MANAGEMENT

(CE, MEC, CSE, CSE (AI&DS,AI&ML,CSE(AI&ML))

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Write a note on disaster leading to food insecurity.	(7M)
1.b)	List the various types of disasters in India. What are their causes?	(7M)
	(OR)	
1.c)	Explain disaster management cycle.	(7M)
1.d)	Compare and contrast hazard and vulnerability.	(7M)
	UNIT-II	
2.a)	Explain different types of Industrial Disasters.	(7M)
2.b)	Discuss in detail the vulnerability profile of India.	(7M)
	(OR)	
2.c)	Briefly explain the natural and manmade disasters.	(7M)
2.d)	What is drought? Explain different types of droughts.	(7M)
	UNIT-III	
3.a)	List the environmental and social impacts of disasters.	(7M)
3.b)	Write about global and national disaster trends.	(7M)
	(OR)	
3.c)	How does climate change influence urban disasters?	(7M)
3.d)	Briefly explain the impacts of disasters on poverty.	(7M)
	UNIT-IV	
4.a)	Give a brief account on post-disaster environmental response in terms of sanitation and food safety including water quality?	(7M)
4.b)	Explain following: (i) relief and recovery, (ii) policies and legislation for disaster risk reduction?	(7M)
	(OR)	
4.c)	How does early warning systems and community participation help disaster risk reduction?	(7M)
4.d)	Explain the roles and responsibilities of NDMA and other stakeholders in Disaster Risk Reduction (DRR) in India.	(7M)
	UNIT-V	
5.a)	Explain about land use changes, urbanization of developmental projects.	(7M)
5.b)	Discuss about sustainable and environmental friendly recovery.	(7M)
	(OR)	
5.c)	What environmental modifications can happen due to land use changes and dams.	(7M)
5.d)	List out and explain Factors affecting vulnerability of disaster.	(7M)

*****

Course Code: 20CE7E03

BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE::ODALAREVU

(AUTONOMOUS)

IV-B.Tech I-Semester Regular/Supplementary Examinations (BR20), NOV 2025

DISASTER MANAGEMENT

(CE, MEC, CSE, CSE (AI&DS,AI&ML,CSE(AI&ML))

Time: 3 hours Max. Marks: 70

---

*Question Paper consists of **FIVE** units, each carrying 14 marks*
*Each unit has **TWO** questions; either of them should be answered*
All parts of a question must be answered at one place

	UNIT-I	
1.a)	Write a note on disaster leading to food insecurity.	(7M)
1.b)	List the various types of disasters in India. What are their causes?	(7M)
	(OR)	
1.c)	Explain disaster management cycle.	(7M)
1.d)	Compare and contrast hazard and vulnerability.	(7M)
	UNIT-II	
2.a)	Explain different types of Industrial Disasters.	(7M)
2.b)	Discuss in detail the vulnerability profile of India.	(7M)
	(OR)	
2.c)	Briefly explain the natural and manmade disasters.	(7M)
2.d)	What is drought? Explain different types of droughts.	(7M)
	UNIT-III	
3.a)	List the environmental and social impacts of disasters.	(7M)
3.b)	Write about global and national disaster trends.	(7M)
	(OR)	
3.c)	How does climate change influence urban disasters?	(7M)
3.d)	Briefly explain the impacts of disasters on poverty.	(7M)
	UNIT-IV	
4.a)	Give a brief account on post-disaster environmental response in terms of sanitation and food safety including water quality?	(7M)
4.b)	Explain following: (i) relief and recovery, (ii) policies and legislation for disaster risk reduction?	(7M)
	(OR)	
4.c)	How does early warning systems and community participation help disaster risk reduction?	(7M)
4.d)	Explain the roles and responsibilities of NDMA and other stakeholders in Disaster Risk Reduction (DRR) in India.	(7M)
	UNIT-V	
5.a)	Explain about land use changes, urbanization of developmental projects.	(7M)
5.b)	Discuss about sustainable and environmental friendly recovery.	(7M)
	(OR)	
5.c)	What environmental modifications can happen due to land use changes and dams.	(7M)
5.d)	List out and explain Factors affecting vulnerability of disaster.	(7M)

*****