AR23

CODE: 23MET203 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March, 2026

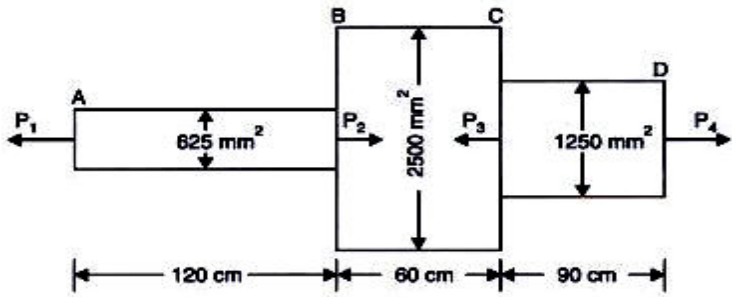
MECHANICS OF SOLIDS

(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

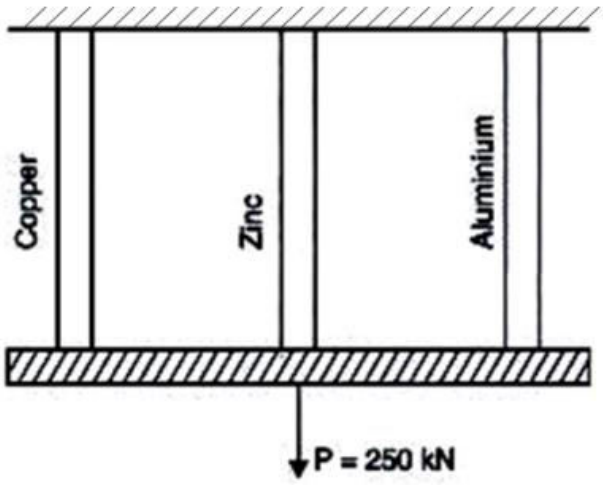
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the following: i) Types of stresses and strains ii) Hooke's law iii) Factor of Safety	7	CO1	2
	b)	A member ABCD is subjected to the loads as shown in figure. Calculate the force P_2 necessary for equilibrium, if P_1 = 45 kN, P_3 = 450 kN and P_4 = 130 kN. Also, determine the total elongation of the member assuming the modulus of elasticity to be 2.1 x 10^5 N/mm^2.	7	CO1	3



(OR)

2.		Three bars made of Copper, Zinc and Aluminium are of equal length and have cross sectional areas 500 mm^2, 750 mm^2 and 1000 mm^2 respectively. They are rigidly connected at their ends. If this composite bar is subjected to a load of 250 kN as shown in figure, estimate the load carried by each rod and the stress induced in each rod. Take the values of E for Copper =1.3 x 10^5 N/mm^2, E for Zinc =1 x 10^5 N/mm^2 and E for Aluminium = 0.8 x 10^5 N/mm^2.	14	CO1	3



UNIT-II

3.	a)	Draw SFD and BMD of a cantilever beam subjected to a point load 'W' at its free end.	7	CO2	2
	b)	Sketch SFD and BMD for cantilever beam of length 5 m, carries UDL of 2 kN/m over the entire span and 5 kN point load at the free end.	7	CO2	3

(OR)

4.		A simply supported beam of 10m long carries a uniformly distributed load 3 kN/m over entire length and point loads 10kN and 20kN at distances 2m and 5m from the left support. Draw the Shear force and bending moment diagrams.	14	CO2	3

UNIT-III

5.	a)	Starting from fundamentals, derive simple bending relation. $$\frac{\sigma}{y} = \frac{M}{I} = \frac{E}{R}$$	7	CO3	3
	b)	Prove that the maximum shear stress in a rectangular section of a beam 3/2 times the average shear stress.	7	CO3	2

(OR)

6.		A shaft is transmitting 97.5 kW at 180 r.p.m. If the allowable shear stress in the material is 60 N/mm^2, find the suitable diameter for the shaft. The shaft is not to twist more that 1° in a length of 3 metres. Take C = 80 $X10^3$ N/mm^2.	14	CO3	3

UNIT-IV

7.	a)	Derive the equations for slope and deflection of a cantilever beam subjected to udl over its entire span using double integration method.	7	CO4	2
	b)	A cantilever of length 3m carries a uniformly distributed load over the entire length. If the deflection at the free end is 40 mm, find the slope at the free end.	7	CO4	3

(OR)

8.	a)	Derive the equations for slope and deflection of a simply supported beam subjected to udl over its entire span using double integration method	7	CO4	3
	b)	A simply supported beam of uniform rectangular section 200 mm wide and 300 mm deep is simply supported at its ends. It carries a udl of 9kN/m over the entire span of 5m. If the value of E is $1X10^4$ N/mm^2; Find (i) Slope at the supports and (ii) maximum deflection.	7	CO4	3

UNIT-V

9.	a)	Derive the formula for Euler's critical load for a column with both ends hinged.	7	CO5	2
	b)	An I-section having top flange 200mm× 10mm, web 380mm X 10mm and bottom flange 200mm× 10mm is used as a column of 6m long with both ends fixed. Find Euler's crippling load. Take Young's modulus for the material of the section as $2X10^5$ N/mm^2.	7	CO5	3

(OR)

10.	a)	Derive the expression for the Euler crippling or buckling load when both the ends of the column are fixed and also state the assumptions in the derivation.	7	CO5	2
	b)	Determine the ratio of buckling strengths of two columns one hollow and the other solid. Both are made of the same material and have the same length, cross sectional area and end conditions. The internal diameter of hollow column is half of its external diameter.	7	CO5	3

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CODE: 23ITT201 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March, 2026

DATABASE MANAGEMENT SYSTEM

(Common to CSE (AIML), CSE(DS) & IT Branches)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	BTL
		UNIT-I			
1.	a)	Differentiate between the physical, logical, and view levels of data representation.	7	CO1	L3
	b)	Analyze how database systems minimize problems of data inconsistency and redundancy compared to file systems.	7	CO1	L3
		(OR)			
2.	a)	Explain the functions of a database engine in processing queries.	7	CO1	L2
	b)	Analyze the importance of the DBA role in maintaining data integrity and availability in large organizations.	7	CO1	L3
		UNIT-II			
3.	a)	Differentiate between Natural Join and Cartesian Product with examples.	7	CO2	L3
	b)	Analyze the significance of composite keys versus single-attribute keys in relational schema design.	7	CO2	L3
		(OR)			
4.	a)	Explain the purpose of aggregate functions (SUM, AVG, MIN, MAX, COUNT) with examples.	7	CO2	L2
	b)	Demonstrate Relational set operations in SQL?	7	CO2	L2
		UNIT-III			
5.	a)	Compare the strengths and limitations of the E-R model with the relational model.	7	CO3	L2
	b)	What is outer join? Explain different types of outer joins in SQL with examples	7	CO3	L2
		(OR)			
6.	a)	Demonstrate the use of SAVEPOINT in a money transfer transaction.	7	CO3	L2
	b)	Differentiate between INNER JOIN, LEFT JOIN, and RIGHT JOIN with examples.	7	CO3	L2
		UNIT-IV			
7.	a)	Define BCNF, 4NF & 5NF with a suitable example.	7	CO4	L2
	b)	Compare dependency-preserving and non-preserving decompositions with respect to query efficiency.	7	CO4	L2
		(OR)			
8.	a)	Analyze the importance of closure of attributes in reasoning about functional dependencies.	7	CO4	L2
	b)	Explain how redundancy in relational schemas leads to anomalies with examples.	7	CO4	L2
		UNIT-V			
9.	a)	Analyze the importance of maintaining transaction states for ensuring database consistency.	7	CO5	L2
	b)	Explain shared and exclusive locks with examples.	7	CO5	L2
		(OR)			
10.	a)	Analyze the problems caused by concurrent executions (lost update, dirty read, unrepeatable read).	7	CO5	L2
	b)	Analyze deadlock as a disadvantage of strict 2PL.	7	CO5	L2

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CODE: 23EET203 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March, 2026

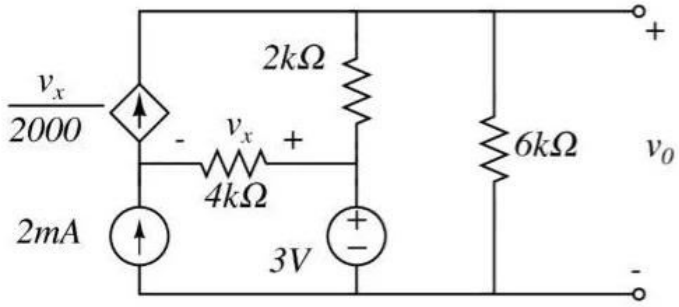
ELECTRIC CIRCUIT THEORY

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	BTL
		UNIT-I			
1.		Find the Norton equivalent circuit across V_o in the network shown	14	1	L4



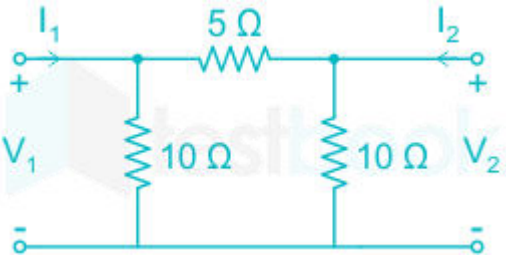
(OR)

2.		State and explain super position theorem with a suitable example	14	1	L2
		UNIT-II			
3.		State and explain Millman's theorem with a suitable example.	14	2	L2
		(OR)			
4.	a)	Derive the condition for transferring the maximum possible power from source to load with a DC excitation. Also, find the efficiency at that condition.	10	2	L4
	b)	What is Q-factor? Why is important?	4	2	L3
		UNIT-III			
5.		Three identical coils, each of resistance 100ohm and inductance 40mH are connected (a) in star and (b) in delta to a 415V, 50 Hz, 3-phase supply. Determine the total active and reactive power in each case.	14	3	L4
		(OR)			

6.		Derive the relation between line and phase voltages and currents in three phase balanced delta connected system.	14	3	L2

UNIT-IV

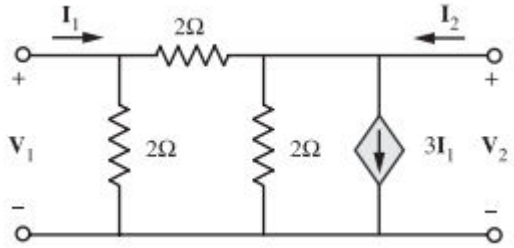
7.	a)	Calculate the admittance parameters for the network shown	8	4	L3



	b)	Derive the condition for reciprocity and symmetry in transmission parameters	6	4	L2

(OR)

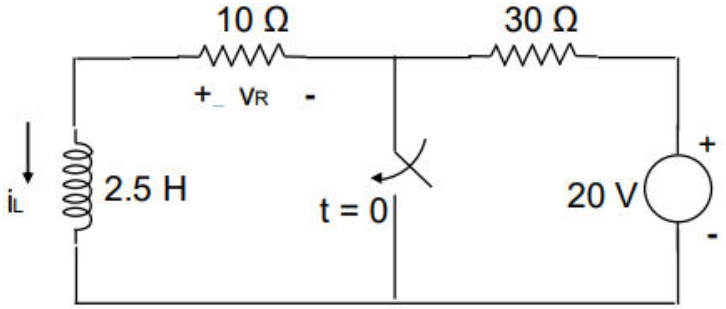
8.	a)	Find the impedance parameters of the two-port network shown	7	4	L4



	b)	Express hybrid parameters in terms of impedance parameters	7	4	L2

UNIT-V

9.		In the circuit shown the switch was in open position for a long time. Determine the current $I_L(t)$ and the voltage $V_R(t)$ for time t > 0.	14	5	L4



(OR)

10.		Derive the voltage expression for a RLC-circuit with sinusoidal excitation when the switch is on at t= 0.	14	5	L2

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CODE: 23ECT204 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March, 2026

ANALOG ELECTRONIC CIRCUITS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Draw and explain the block diagram of current series feedback amplifiers	7	1	L2
	b)	Discuss the operation of Hartley Oscillator	7	1	L2
		(OR)			
2.	a)	Describe the effects of negative feed back on resistances	7	1	L3
	b)	Briefly discuss about Barkheusen criterion	7	1	L2
		UNIT-II			
3.	a)	Discuss about how gain is calculated in multistage amplifiers with a block diagram	10	2	L4
	b)	Discuss the merits of Darlington pair	4	2	L3
		(OR)			
4.	a)	Write short notes on gain bandwidth product	7	2	L3
	b)	Briefly explain the operation of CS amplifier	7	2	L2
		UNIT-III			
5.	a)	Describe the operation of class B push pull power amplifier	7	3	L2
	b)	Write short notes on thermal cooling	7	3	L2
		(OR)			
6.	a)	Discuss the operation of Class AB power amplifier	7	3	L1
	b)	Describe about single tuned capacitive coupled amplifier	7	3	L2
		UNIT-IV			
7.	a)	Discuss how transistor works as a switch with a neat diagram	9	4	L3
	b)	What is the need for commutating capacitors and explain briefly	5	4	L4
		(OR)			
8.	a)	Discuss the operation of monostable multivibrator	10	4	L3
	b)	Discuss the purpose of triggering and explain it briefly	4	4	L2
		UNIT-V			
9.	a)	Describe Miller Time Base generator with a neat sketch	7	5	L2
	b)	Discuss different methods of generating a time based wave form	7	5	L1
		(OR)			
10.	a)	What are the general features of time base generators and explain them	10	5	L1
	b)	Why linearity improvement is needed in time based generators	4	5	L2

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CODE: 23CST203 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March – 2026
Digital Logic and Computer Organization
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	BTL
		UNIT-I			
1.	a)	i) Convert $(657)_8$ into decimal ii) Convert $(2348)_{10}$ into hexadecimal.	7	1	L3
	b)	Convert the following signed magnitude binary numbers to decimal: i) 10010110 ii) 01101001	7	1	L2
		(OR)			
2.	a)	Convert the following binary numbers to their 1's and 2's complements: i) 01010100 ii) 10011001	7	1	L3
	b)	Explain binary addition with the help of truth table and examples.	7	1	L2
		UNIT-II			
3.	a)	What is a Boolean function? Explain how Boolean expressions are derived from truth tables, with examples.	7	2	L2
	b)	Obtain the simplified expression in SOP form of F(a,b,c,d,e)=∑(1,2,4,7,12,14,15,24,27,29,30,31)using K-maps.	7	2	L3
		(OR)			
4.	a)	Explain DeMorgan's Theorems. Use them to simplify the expression: $\overline{A + \overline{B}C}$	7	2	L3
	b)	Design a multiplexer circuit using truth tables and logic symbols also explain working of multiplexer.	7	2	L2

UNIT-III

5.	a)	Describe the basic operational concepts of a computer system. How does the CPU fetch, decode, and execute instructions? Illustrate your answer with a block diagram.	7	3	L3
	b)	What is a control unit? Compare and contrast hardwired and microprogrammed control units. Describe how the control unit generates control signals.	7	3	L4

(OR)

6.	a)	Explain the concept of bus architecture in computer systems. Describe the data bus, address bus, and control bus with their roles in CPU-memory communication.	7	3	L2
	b)	Describe RTL and draw a circuit about 4-bit register to memory.	7	3	L3

UNIT-IV

7.	a)	Explain about memory Hierarchy along with suitable diagram also mention merits and demerits of each level.	7	4	L2
	b)	Explain the concept of asynchronous data transfer. Why is it necessary in I/O operations?	7	4	L2

(OR)

8.	a)	Describe different cache replacement policies with examples.	7	4	L2
	b)	What is Direct Memory Access (DMA)? Explain the working of a DMA controller with a block diagram.	7	4	L2

UNIT-V

9.	a)	Describe the Four stage instruction pipeline. What are the functions of each stage?	7	5	L3
	b)	Define cache coherency in the context of multiprocessor systems. Why is it a critical issue?	7	5	L2

(OR)

10.	a)	Explain the concept of data hazards and describe techniques to handle them, such as forwarding and pipeline stalls.	7	5	L2
	b)	Compare the advantages and disadvantages of different interconnection structures used in multiprocessors.	7	5	L3

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CODE: 23CET203 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, March, 2026
Strength of Materials
(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Classify the stresses and strains and give examples for each case.	7 M	1	Understand
	b)	A metallic bar 300 mm × 100 mm × 40 mm is subjected to a force of 5 kN (tensile), 6 kN (tensile) and 4 kN (tensile) along x, y and z directions respectively. Determine the change in the volume of the block. Take $E = 2 \times 10^5$ N / mm^2 and Poisson's ratio = 0.25.	7 M	1	Apply
		(OR)			
2.	a)	Formulate the relation between Modulus of Elasticity Modulus of rigidity and Poisson's Ratio of an elastic body.	7 M	1	Understand
	b)	A compound bar is constructed from three bars 50 mm wide by 12 mm thick fastened together to form a bar 50 mm wide by 36 mm thick. The middle bar is of aluminium alloy for which E = 70 GN/m^2 and the outside bars are of brass with E = 100 GN/m^2. If the bars are initially fastened at 18°C and the temperature of whole assembly is then raised to 50°C, determine the stresses set up in the brass and the aluminium.	7 M	1	Apply
		UNIT-II			
3.	a)	A simply supported beam of span L is subjected to a point load 'W' at centre. Sketch the SFD and BMD of the beam indicating principal values.	7 M	2	Apply
	b)	A cantilever beam of length 3 m carries a uniformly distributed load of 1.5 kN/m run over a length of 2 m from the free end. Sketch the SFD and BMD.	7 M	2	Apply
		(OR)			
4.	a)	A of simply supported beam of span L is subjected to an U.D.L 'w' per meter over the entire span. Sketch the SFD and BMD of the beam indicating principal values.	7 M	2	Apply
	b)	A cantilever of length 12 m carries two point loads 4 kN and 6 kN at a distance of 2 m and 6 m from fixed end respectively. In addition to this the beam also carries a uniformly distributed load of 2kN/m over a length of 4 m at a distance of 6 m from the fixed end. Draw the S.F and B.M diagrams for the cantilever.	7 M	2	Apply

UNIT-III

5.	a)	What do you mean by shear stress in beams? Derive the expression for shear stress in a rectangular section of beam.	7 M	3	understand
	b)	A beam 500 mm deep of a symmetrical section has I = 1 $\times 10^8$ mm^4 and is simply supported over a span of 10 m. Determine the uniformly distributed load it may carry if the maximum bending stress is not to exceed 150 N/ mm^2.	7 M	3	Apply

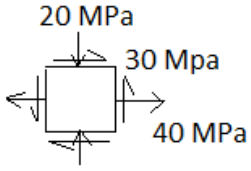
(OR)

6.	a)	Prove that the maximum shear stress of a Circular section is equal to 1.33 times of average shear stress.	7 M	3	Apply
	b)	Prove that the maximum shear stress in a triangular section of a beam is given by $\tau_{max} = \frac{3F}{bh}$ where b is base width and h is height.	7 M	3	Apply

UNIT-IV

7.	a)	A solid circular steel shaft is transmitting 200 Horsepower at 300 rpm. Determine the diameter of the shaft if the maximum shear stress is not to exceed 80 N/mm^2 and angular twist per metre length of the shaft is not to exceed 1 °. Take G = 80,000	7 M	4	Apply
	b)	At a point with in body is subjected to two mutually perpendicular directions, the stresses are 80 N/mm^2 tensile and 40 N/mm^2 tensile. Each of above stresses is accompanied by a shear stress of 60 N/mm^2. Determine the normal stress, shear stress and resultant stress on an oblique plane inclined at an angle of 45^0 with the axis of minor tensile stress.	7 M	4	Apply

(OR)

8.	a)	Determine the principal stresses and maximumshear stress and their planes of orientation for the stress system shown in figure. 	7 M	4	Apply
	b)	Calculate the maximum stress in a propeller shaft with a 400 mm external and 200 mm internal diameter, when subjected to a twisting moment of 4650 Nm.lf the modulus of the rigidity, C=82 GN/m^2 ,how much is the twist in the length 20 times the diameter?	7 M	4	Apply

UNIT-V

9.	a)	Derive the expression for Euler's crippling load for a column When one end is hinged other end is fixed.	7 M	5	Apply
	b)	Derive the expression for Euler's crippling load for a column When both ends are fixed.	7 M	5	Apply

(OR)

10.	a)	What is the ratio of the strength of a solid steel column of 150 mm diameter to that of a hollow circular steel column of the same cross-sectional area and a wall thickness of 15 mm? The two columns have the same length and similar end conditions.	7 M	5	Apply
	b)	Compute the crippling load of a solid round bar 3 m long and 50 mm in diameter is used as a strut for the following conditions. i) when both ends hinged and ii) one end of the strut is fixed and the other end is free.	7 M	5	Apply

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CODE: 20MET203 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March-2026

FLUID MECHANICS

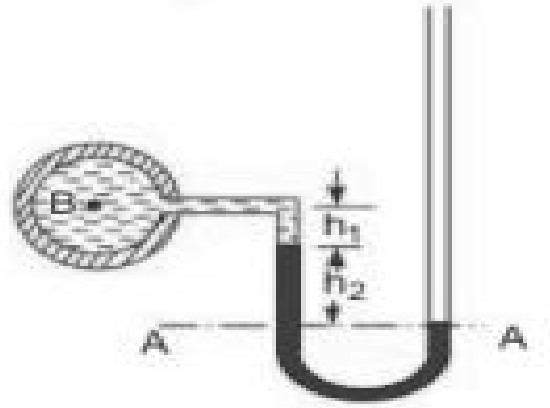
(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

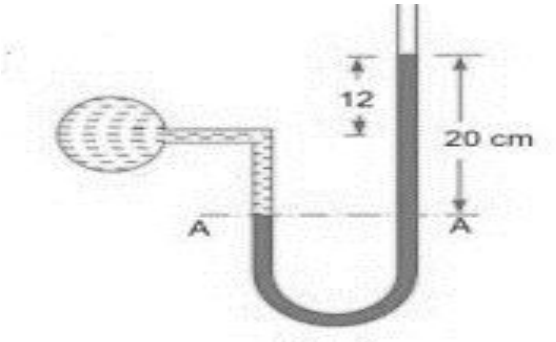
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Define the following i) Density ii) Specific Gravity iii) weight density.	5M	1	Remembering
	b)	State and prove Hydrostatic law and explain its significance using a 2D fluid element.	5M	1	Understanding
		(OR)			
2.	a)	Determine the pressure at point B for the manometer configuration shown in the figure below. Assume the density of manometric fluid as ρ_m and density of fluid in pipe as ρ_b	5M	1	Evaluating



	b)	A simple manometer is connected to a pipe as shown in the figure below. Determine the pressure in the pipe if a fluid specific gravity of 0.8 is flowing through the pipe. Consider mercury as the manometric fluid with a specific gravity of 13.6.	5M	1	Evaluating



UNIT-II

3.		Explain classification of fluid flows with examples	10	2	Understanding
		(OR)			
4.	a)	Determine the volume of water displaced for a wooden block of width 3m and depth of 1.5 m, when it floats horizontally in water. The density of wooden block is 700 kg/m^3 and its length is 7m.	5	2	Evaluating
	b)	A body is 6 m long, 3m wide and 2 m high. The depth of immersion of body in sea water is 0.90 m. If the centre of gravity is 0.6m above the bottom of the body, determine the meta centric height. Assume density of sea water = 1025 kg/m^3	5	2	Evaluating

			Marks	CO	Bloom s Level
		UNIT-III			
5.	a)	Define the following flows with examples i) Steady flow ii) Unsteady flow iii) Uniform flow	5	3	Remembering
	b)	Define velocity potential function and prove that the flow is irrotational for potential flows.	5	3	Remembering
		(OR)			
6.		Derive Euler's equation for a flow along a streamline and state the assumptions .	10	3	Understanding
		UNIT-IV			
7.		Derive the relation for finding discharge through orifice meter using Bernoulli's equation	10	4	Understanding
		(OR)			
8.	a)	Derive a relation for finding the loss due to sudden contraction in a pipe flow.	5	4	Understanding
	b)	When a sudden contraction is introduced in a horizontal pipeline from 50 cm diameter to 25 cm diameter, the pressure changes from 105 kPa to 69 kPa. If the coefficient of contraction is assumed to be 0.65, calculate the water flow rate.	5	4	Evaluating
		UNIT-V			
9.	a)	Explain the principle of dimensional homogeneity and its applications	5	5	Understanding
	b)	Distinguish between Buckingham's pi- theorem and Rayleigh's method.	5	5	Applying
		(OR)			
10.		The pressure drop Δp in pipe of diameter D and length l depends on the density ρ and viscosity μ of the flowing fluid, mean velocity V of flow and the average height of protuberance t. Show that pressure drop can be expressed in the form $$\Delta P = \rho V^2 f\left(\frac{l}{D}, \frac{\mu}{VD\rho}, \frac{t}{D}\right)$$	10	5	Understanding
		UNIT-VI			
11.		Derive the equation for finding out energy thickness for the flow over a flat plate	10	6	Understanding
		(OR)			
12.		Determine the displacement thickness and momentum thickness in terms of the nominal boundary layer thickness δ in respect of the following velocity profile $$\frac{u}{U_0} = \left(\frac{y}{\delta}\right)^{1/7}$$	10	6	Evaluating

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CODE: 20EET204 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March- 2026

ELECTRICAL MEASUREMENTS

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	What is controlling Torque? Explain about spring controlling torque?	(5M)	CO1	Understand
	b)	Explain the principle of operation of a permanent magnet moving coil type instrument?	(5M)	CO1	Understand
		(OR)			
2.	a)	Describe the construction and working principle of attraction type moving iron instrument?	(5M)	CO1	Understand
	b)	A moving coil instrument having internal resistance of 50Ω indicates full scale deflection with a current of 10mA. How can it be made to work as (i) a voltmeter to read 100V on full scale (ii) an ammeter of 1A, on full scale?	(5M)	CO1	Apply
		UNIT-II	Marks	CO	Blooms Level
3.	a)	List the advantages and disadvantages of instrument transformers?	(5M)	CO2	Remember
	b)	A current transformer has a single turn primary and 400 secondary turns. Magnetizing current is 90A. While Core Loss current is 40A. Phase angle is 28°. Calculate actual primary current and % ratio error when secondary carries 5A current?	(5M)	CO2	Apply
		(OR)			
4.	a)	Explain with a neat circuit of single phase Dynamometer type Wattmeter working?	(5M)	CO2	Understand
	b)	With help of neat sketch, explain about a reactive power measurement using single wattmeter. Also Draw the phasor diagram.	(5M)	CO2	Understand
		UNIT-III	Marks	CO	Blooms Level
5.	a)	Explain the operation of single phase induction type energy meter?	(5M)	CO3	Understand
	b)	A 230 V, 50 Hz single phase energy meter has a constant of 200 revolutions per kWh.While supplying a non-inductive load of 4.4 A at normal voltage, the meter takes3 minutes for 10 revolutions. Calculate the percentage error of the instrument	(5M)	CO3	Apply

(OR)

			Marks	CO	Blooms Level
6.	a)	Explain testing of single phase energy meter by phantom loading using R.S.S.meter.?	(5M)	CO3	Understand
	b)	Explain about maximum demand meter?	(5M)	CO3	Understand

UNIT-IV

			Marks	CO	Blooms Level
7.	a)	Draw the circuit diagram of wheatstone's bridge and derive the balance condition?	(5M)	CO4	Understand
	b)	Explain working principle of Kelvin's Double bridge with neat circuit diagram?	(5M)	CO4	Understand
		(OR)			
8.	a)	Describe the working of Hay's bridge with the help of phasor diagram and also derive the balanced condition.	(5M)	CO4	Understand
	b)	An ac bridge was made up as follows: arm ab, a capacitor of 0.8 mF in parallel with 1 kΩ resistance, bc a resistance of 3 kΩ, arm cd an unknown capacitor C_x and R_x in series, arm da a capacitance of 0.4 mF. The supply at 1 kHz is connected across bd and a detector across ac. Determine the value of unknown capacitance Cx, unknown series resistance Rx?	(5M)	CO4	Apply

UNIT-V

			Marks	CO	Blooms Level
9.	a)	A simple slide wire is used for measurement of current in a circuit. The voltage drop across a standard resistor of 0.1 Ω is balanced at 75 cm. Find the magnitude of the current if the standard cell e.m.f. of 1.45 V is balanced at 50cm?	(5M)	CO5	Apply
	b)	Explain the operating principle and constructional details of AC co-ordinate type potentiometer?	(5M)	CO5	Understand
		(OR)			
10.	a)	Explain the working of ballistic galvanometer with circuit diagram?	(5M)	CO5	Understand
	b)	Explain the AC Potentiometer method for measurement of iron losses in ferromagnetic materials?	(5M)	CO5	Understand

UNIT-VI

			Marks	CO	Blooms Level
11.	a)	Explain the Digital frequency meter?	(5M)	CO6	Understand
	b)	List the advantages of electrical transducers?	(5M)	CO6	Remember
		(OR)			
12.	a)	Explain the working of a piezo electric transducer with a suitable diagram?	(5M)	CO6	Understand
	b)	Explain about Thermistors?	(5M)	CO6	Understand

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AR20

CODE: 20ECT203 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March-2026

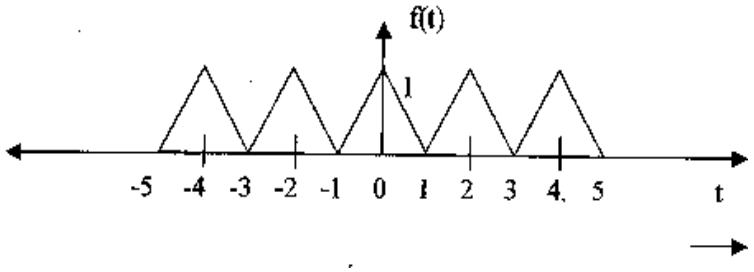
SIGNALS & SYSTEMS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		UNIT-I	Marks	CO	Blooms Level
1.	a)	Explain the periodicity, even or odd and energy or power for a signal with an example.	5M	2	understand
	b)	A rectangular function defined by $f(t) = 1; 0<t<\pi$ $-1; \pi<t<2\pi$ Approximate above rectangular function by a single sinusoid "sin t", evaluate mean square error in this approximation.	5M	3	Apply
		(OR)			
2.	a)	What is a signal? discuss the classification of signals.	5M	2	Understand
	b)	Explain the slandered signals in detail.	5M	3	Apply
		UNIT-II			
3.	a)	Find the exponential Fourier series and plot the magnitude and phase spectrum of the following triangular wave form.	5M	1	Remembering



	b)	State and prove any two properties of Fourier transform.	5M	2	Understand
		(OR)			
4.	a)	With regard to Fourier series representation, justify the following statements (i) Odd functions have only sine term (ii) Even functions have no sine term	5M	5	Evaluating
	b)	Derive the Fourier transform equation for aperiodic signals using Fourier series.	5M	6	Create
		UNIT-III			
5.	a)	What is an LTI system? State the properties of LTI system.	5M	2	Understand
	b)	Explain the following systems in detail. i) Linear and nonlinear system ii) Causal and non causal system	5M	2	Understand
		(OR)			

6.	a)	What is the need for bandwidth and explain the terms signal bandwidth and system bandwidth.	5M	2	Understand
	b)	Consider a stable LTI system characterized by the differential equation $$\frac{d^2}{dt^2}y(t)+4\frac{d}{dt}y(t)+3y(t)=\frac{d}{dt}x(t)+2x(t)$$ Find its impulse response and transfer function. Also find the response of the system if $x(t) = t\,e^{-t}\,u(t)$.	5M	1	Remembering

UNIT-IV

7.	a)	Find the convolution between two signals $x_1(t)=u(t)$ and $x_2(t)=e^{-3t}u(t)$.	5M	1	Remembering
	b)	Write the properties of convolution in detail.	5M	1	Remembering
		(OR)			
8.	a)	Explain the convolution operation between two signals. State the properties of convolution.	5M	2	Understand
	b)	State and explain the properties of autocorrelation function.	5M	2	Understand

UNIT-V

9.	a)	State and prove any three properties of Laplace transforms.	5M	2	Understand
	b)	Determine the Laplace transform of $x_1(t)$= sinwt and $x_2(t)$=coswt.	5M	3	Apply
		(OR)			
10.	a)	What is ROC of Laplace transform? State the properties of ROC.	5M	2	Understand
	b)	Determine the function of time x(t) for each of the following Laplace transforms and their associated regions of convergence.	5M	3	Apply

i. $\frac{(s+1)^2}{s^2-s+1}$ $\quad$ $\mathrm{Re}\{S\} > 1/2$

ii. $\frac{s^2-s+1}{(s+1)^2}$ $\quad$ $\mathrm{Re}\{s\} > -1$

UNIT-VI

11.	a)	State sampling theorem for band limited signals. Explain aliasing effect and how to overcome it?	5M	2	Understand
	b)	State and prove any two properties of Z transform.	5M	2	Understand
		(OR)			
12.	a)	Determine Nyquest rate corresponding to signals i) $x(t) = 1+\cos 2000\pi t + \sin 4000\pi t$ ii) ii) $x(t) = \sin 4000\pi t/\pi t$.	5M	3	Apply
	b)	Find the Z transform of $\mathrm{Sin}(w_n)u(n)$ and $\mathrm{Cos}(w_n)u(n)$.	5M	1	Remembering

AR20

CODE: 20CST203 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March-2026

Computer Organization & Architecture

(COMMON TO CSE, IT, CSE(AIML) & CSE(DS) Branches)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the primary function of the control unit in a CPU. How does it coordinate the execution of instructions?	5	1	1
	b)	Describe the key components and their functions in the instruction execution cycle of a CPU	5	1	2
		(OR)			
2.	a)	Define addressing modes in the context of CPU instruction sets. Provide examples of different addressing modes.	5	1	1
	b)	Discuss the concept of Register-Transfer Language (RTL) interpretation of instructions in CPU design. Provide an example to illustrate the RTL interpretation of a simple instruction.	5	1	2
		UNIT-II			
3.	a)	Discuss the principles behind Booth's multiplication algorithm. Provide an example demonstrating how Booth's algorithm can be applied to multiply two binary numbers.	5	2	2
	b)	How does the shift-and-add multiplication technique work? Provide an example to illustrate its operation.	5	2	2
		(OR)			
4.	a)	Implement an array multiplier for multiplying two binary numbers. Illustrate how the array multiplier works using a specific example.	5	2	3
	b)	Analyze the advantages and limitations of restoring and non-restoring division techniques in computer arithmetic. Discuss the scenarios in which each technique is preferable.	5	2	4
		UNIT-III			
5.	a)	Explain how associative memory is organized in hardware. Describe the role of match logic in associative memory.	5	3	2
	b)	Define the concept of main memory (RAM) in computer architecture. Explain the key characteristics that distinguish RAM from other forms of memory.	5	3	1
		(OR)			
6.	a)	Compare and contrast the three cache memory mapping techniques: associative mapping, direct mapping, and set associative mapping. Discuss the trade-offs involved in each approach.	5	3	2
	b)	Design a memory hierarchy for a computer system that includes RAM, cache memory, and virtual memory. Provide a schematic representation and explain data flow between these components.	5	3	3
		UNIT-IV			
7.	a)	Define the term "input-output interface" in computer architecture. Explain its significance in connecting peripheral devices to a computer system.	5	4	1
	b)	Implement a priority interrupt system for handling multiple peripheral devices. Describe how the priority levels are determined and how interrupts are serviced.	5	4	3
		(OR)			

8.	a)	Design an I/O bus architecture for connecting multiple peripheral devices to a computer system. Provide a diagram and explain how devices are addressed and managed.	5	4	3
	b)	Analyze the differences between direct memory access (DMA) and programmed I/O for data transfer. Discuss situations in which each method is preferable.	5	4	4
		UNIT-V			
9.	a)	Design an arithmetic pipeline for performing vector addition. Provide a step-by-step explanation of how data flows through the pipeline and how results are obtained.	5	5	3
	b)	List and briefly describe the primary stages in an arithmetic pipeline. How do these stages contribute to improved processing efficiency?	5	5	1
		(OR)			
10.	a)	Explain the concept of pipelining in computer architecture and its role in achieving parallel processing. Provide a basic overview.	5	5	1
	b)	Implement an instruction pipeline for a hypothetical CPU architecture. Show how different stages of the pipeline process and execute instructions	5	5	3
		UNIT-VI			
11.	a)	Explain the concept of interprocessor arbitration in multiprocessor systems. Describe the need for arbitration and how it ensures fairness among processors.	5	6	2
	b)	Analyze the advantages and drawbacks of different interconnection structures in multiprocessor systems. Discuss factors influencing the choice of an interconnection type.	5	6	4
		(OR)			
12.	a)	Define the characteristics of multiprocessors in computer architecture. Explain why multiprocessor systems are advantageous in certain applications.	5	6	1
	b)	Design an interconnection structure for a four-processor multiprocessor system. Provide a schematic representation and explain how processors communicate through this structure.	5	6	3

AR18

CODE: 18CST204 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, March,2026

Free Open Source Software

(Common to CSE & IT Branches)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	How many different ways are there to run Python? Which one is preferable one?	6 M
	b)	What do you meant by Free and Open Source Software? Explain the necessity of FOSS.	6 M
		(OR)	
2.	a)	Explain about arithmetic and comparison operators.	6 M
	b)	Explain the rules of precedence used by python to evaluate an expression.	6 M

UNIT-II

3.	a)	Mention the advantages of continue statement. Write a program to compute odd numbers sum within the given natural number using continue statement.	4 M
	b)	List and give syntax of all python supported conditional statements along with its usage with an example program whether a given number is positive or negative or zero.	8 M
		(OR)	
4.	a)	List and explain any six built in string handling functions supported by python.	8 M
	b)	What is numeric coercion? Explain the rules of numeric coercion.	4 M

UNIT-III

5.	a)	With an example explain the following built in functions of python. i) filter() ii)map() iii) reduce()	8 M
	b)	How tuples are created in python? Explain different ways of creating and accessing them.	4 M
		(OR)	
6.	a)	Prompt for file name and display the number of words in that text file.	4 M
	b)	Explain fundamental file operations in Python with code examples.	8 M

UNIT-IV

7.	a)	Write a perl program to find sum of all even numbers from 1 to n.	4 M
	b)	List and Explain the features of perl.	8 M
		(OR)	
8.	a)	Write a perl program to read a number from standard input device and check if it is even number. Display appropriate message.	6 M
	b)	List and explain different control structures supported by perl.	6 M

UNIT-V

9.	a)	Briefly explain about i) tell ii) seek iii) sysseek.	6 M
	b)	Write a perl program to copy content of one file to another.	6 M
		(OR)	
10.	a)	Explain about operators in perl.	6 M
	b)	Explain about different attributes of a subroutine	6 M

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