Department of Mechanical Engineering
II Year III Sem.
3ME2-01: AEM

Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT--I

Q1 Use Lagrange Formula; express the rational function $\frac{3x^2+x+1}{(x-1)(x-2)(x-3)}$ as a sum of partial fractions.	BLT-4	CO-1
Q2 Calculate (upto 3 places of decimal) $\int_1^8 \frac{dx}{1+x}$ by dividing the rang into eight parts	BLT-4	CO-1
Q3 Use stirling formula to findy_{28}, given$y_{20} = 49225,\ y_{25} = 48316, y_{30} = 47236, y_{35} = 45926, y_{40} = 44306.$	BLT-4	CO-1
Q 4 A body moving with velocity v at any time t satisfies the data T: 0, 1, 3, 4 V: 21, 15, 12, 10 Obtain the distance travelled in 4 seconds and acceleration at the end of 4 seconds	BLT-4	CO-1

ASSIGNMENT-II

Q1 Given that $\frac{dy}{dx} = x^2(1+y)$ and $y(1) = 1, y(1.1) = 1.233, y(1.2) = 1.548, y(1.3) = 1.979$. Evaluate $y(1.4)$ by Milne method. .	BLT-3	CO-2
Q2. Using Halving method or Bisection method, find the approximate root of the equation $x^4 + 2x^3 - x - 1 = 0$ lying in the interval [0,1].	BLT-3	CO-2
Q 3. If $\frac{dy}{dx} = x + y$, use Runge - Kutta method to find an approximate value of y for x=0.2, given that y=1 when x=0 and taking h=0.1.	BLT-2	CO-2
Q 4 Using Euler's modified method; obtain a solution of $\frac{dy}{dx} = x + \lvert\sqrt{y}\rvert, y(0) = 1$ for the range $0 \le x \le 0.4$ in steps of 0.2.	BLT-2	CO-2

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.
3ME2-01: AEM

Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT-III

Q 1 Find the Laplace transform of $\sin\sqrt{t}$. Hence show that $L\left(\frac{\cos\sqrt{t}}{\sqrt{t}}\right) = \left(\frac{\pi}{s}\right)^{1/2} e^{-1/4s}$.	BLT-4	CO-3
Q 2 Apply the convolution theorem to evaluate $L^{-1}\left(\frac{s}{(s^2+a^2)(s^2+b^2)}\right)$	BLT-3	CO-3
Q 3 State and proof of convolution theorem for Laplace transform.	BLT-2	CO-3
Q 4 Prove that$\left(\frac{sin^2 t}{t}\right) = tan^{-1}\left(\frac{1}{s}\right)$. Hence find Laplace transform of $\frac{\sin at}{t}$. Dose $\frac{\cos at}{t}$ exists? Also prove that$\int_0^\infty \frac{sin^2 t}{t} dt = \frac{\pi}{2}$	BLT-3	CO-3
Q 5 Find $L^{-1}\left[\frac{s}{s^4+4a^4}\right]$.	BLT-2	CO-3

ASSIGNMENT-IV

Q 1. Find the Fourier cosine transform of e^{-x^2}. 6	BLT-3	CO-4
Q 2 Find the Fourier sine transform of the following function: $f(x) = \begin{cases} x, & 0 < x < 1 \\ 2-x, & 1 < x < 2 \\ 0, & x > 2 \end{cases}$	BLT-3	CO-4
Q 3 Find the f(x) if its Fourier sine transform is $\frac{s}{1+s^2}$. .	BLT-3	CO-4
Q 4 Express the function $f(x) = \begin{cases} \frac{2}{\pi}\sin x, 0 \le x \le \pi \\ 0, \quad x > \pi \end{cases}$ as a Fourier sine integral and hence evaluate$\int_0^\infty \frac{\sin\pi\lambda \sin x\lambda}{1-\lambda^2} d\lambda$.	BLT-3	CO-4
Q 5 Find the Fourier transform of $f(x) = \begin{cases} 1-x^2, & \lvert x\rvert < a \\ 0, & \lvert x\rvert > a \end{cases}$. Hence prove that: $\int_0^\infty \left(\frac{x\cos x - \sin x}{x^3}\right)\cos\frac{x}{2} dx = -\frac{3\pi}{16}$.	BLT-2	CO-4

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.
3ME2-01: AEM

Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT-V

Q 1 State and prove the convolution theorem for Z-transform $(n \geq 0)$..	BLT-3	CO-5
Q 2 Solve $u_{n+2} - 6u_{n+1} + 8u_n = 2^n + 6^n$.	BLT-3	CO-5
Q 3 Find the $Z^{-1}\left[\frac{9z^3}{(3z-1)^2(z-2)}\right]$ by residue method.	BLT-2	CO-5
Q 4 $Z(u_n) = \bar{u}(z), n \geq 0$, then $\lim_{n\to\infty}(u_n) = \lim_{z\to 1}(z-1)\bar{u}(z) = u_\infty$.	BLT-3	CO-5
Q5 Find the Z-transform of $n^2; n \geq 0$. Hence find the $Z[(n-1)^2]$..	BLT-4	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.

3ME1-03: Managerial Economics and Financial Accounting

Note: Each Assignment of Maximum marks10. All question carries equal marks.

ASSIGNMENT-I

1	What is circular flow of income in economy? Explain with diagram.	BLT-2	CO-1
2	Explain the scope of managerial economics.	BLT-2	CO-1
3	What is mixed economy?	BLT-1	CO-1
4	Differentiate inductive and deductive approach of economy.	BLT-4	CO-1
5	What do you mean by Managerial Economics?	BLT-1	CO-1

ASSIGNMENT-II

1	Write down the types of variation in demand with graph.	BLT-2	CO-2
2	Explain the law of supply.	BLT-2	CO-2
3	What are the various determinants of demand?	BLT-1	CO-2
4	What are the various degrees of elasticity of demand?	BLT-1	CO-2
5	Define supply?	BLT-1	CO-2

ASSIGNMENT-III

1	What is production function?	BLT-1	CO-3
2	Define monopoly.	BLT-1	CO-3
3	Explain the concept of isoquants with its properties	BLT-2	CO-3
4	What is fund flow ? Prepare the format of it.	BLT-3	CO-3
5	Elaborate the term market structure, with the help of its various features.	BLT-2	CO-3

ASSIGNMENT-IV

1	What are the various types of ratios.	BLT-1	CO-4
2	Why there is need of financial analysis?	BLT-1	CO-4
3	What are the various short run costs, explain with the help of curves?	BLT-2	CO-4
4	Expand the terms TFC, TVC, MC , AC, AVC and AFC.	BLT-2	CO-4
5	What do you mean by accounting?	BLT-1	CO-4

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering

II Year IV Semester

3ME1-03 MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTING

Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT-V

1 Compute MP and AP from the given information-	BLT-4	CO-5
2 Prepare final accounts of Mr. Ram and Bro. from the following extracted data-	BLT-5	CO-5
3 What is demand?	BLT-1	CO-5
4 What is circular flow of income in economy? Explain with diagram.	BLT-1	CO-5

Labour	10	20	30	40	50	60	70	80	90
Output	550	660	780	950	1200	1350	1300	1300	1250

Capital	2,00,000	Discount received	2,000
Drawings	20,000	Manufacturing expenses	75,000
Sales	10,00,000	Salaries	22,000
Debtors	1,00,000	Factory Rent	9,000
Purchase Return	6,000	Investment	5,000
Bills payable	28,000	Furniture	60,000
Bad Debts	2,000	Purchase	6,00,000
Printing and stationary	4,000	Creditors	1,20,000
Interest received	500	Sales return	14,000
Loan from Mohan	9,000	Bills receivable	60,000
Carriage outwards	3,000	Advertisement	4,000
Carriage inwards	22,000	Discount allowed	1,000
Depreciation	4,500	Plant and machinery	90,000
Stock on 01.04.21	1,37,500	Cash in hand	58,000
Other expenses	5,000	Cash at bank	70,000
		Closing Stock	50,000

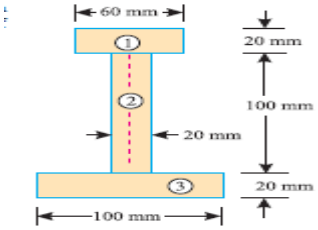
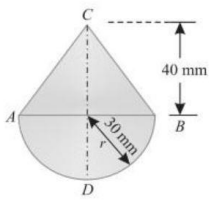
*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.
3ME3-04 Engineering Mechanics
Note: Each Assignment of Maximum marks10.All question carries equal marks.

Assignment-I

Q1	State and prove Varignon's principle of moments.	**CO-1**	**BLT-1**
Q2	State and prove Lami's theorem.	**CO-1**	**BLT-1**
Q3	State and prove parallelogram law of forces.	**CO-1**	**BLT-2**
Q4	The following forces act at a point : (i) 20 N inclined at 30° towards North of East, (ii) 25 N towards North, (iii) 30 N towards North West, and (iv) 35 N inclined at 40° towards South of West. Find the magnitude and direction of the resultant force.	**CO-1**	**BLT-1**
Q5	Find the magnitude of the two forces, such that if they act at right angles, their resultant is √10 N. But if they Act at 60°, their resultant is √13 N.	**CO-1**	**BLT-3**

Assignment -II

Q1	State and prove the theorem of perpendicular axis applied to moment of inertia.	**CO-2**	**BLT-1**
Q2	What is pulley? State the working of first system, second system, and third system of pulleys.	**CO-2**	**BLT-1**
Q3	An I-section is made up of three rectangles as shown in Fig Find the moment of inertia of the section about the horizontal axis passing through the centre of gravity of the section. 	**CO-2**	**BLT-2**
Q4	State and prove theorem of parallel axis applied to moment of inertia.	**CO-2**	**BLT-1**
Q5	A body consists of a right circular solid cone of height 40 mm and radius 30 mm placed on a solid hemisphere of radius 30 mm of the same material. Find the position of centre of gravity of the body. 	**CO-2**	**BLT-3**

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.
3ME3-04 Engineering Mechanics
Note: Each Assignment of Maximum marks10.All question carries equal marks.

Assignment -3

Q1	Name and briefly describe the types of friction. What are the fundamental laws of friction, and how do they influence mechanical systems?	**CO-3**	**BLT-1**
Q2	Define the angle of friction and the angle of repose. How are these angles determined experimentally, and what do they signify in relation to frictional forces?	**CO-3**	**BLT-1**
Q3	Explain how friction affects the stability and motion of a ladder and a wedge. What role does friction play in their mechanical operation?	**CO-3**	**BLT-2**
Q4	Discuss the different types of belts used in belt drives. What is the velocity ratio in belt drives, and how is it affected by slip?	**CO-3**	**BLT-1**
Q5	Compare the advantages and disadvantages of V-belts over flat belts in power transmission applications. What are the key reasons for choosing one type over the other in specific scenarios?	**CO-3**	**BLT-3**

Assignment-4

Q1	Name and briefly describe the different types of motion studied in kinematics. Provide an example for each type.	**CO-4**	**BLT-1**
Q2	What are the equations of motion for a particle in rectangular coordinates? How are velocity and acceleration components determined from these equations?	**CO-4**	**BLT-1**
Q3	Define angular velocity and angular acceleration for a rigid body. How do they relate to the translational motion of a rigid body?	**CO-4**	**BLT-2**
Q4	Explain the principles governing projectile motion on a plane and on an inclined plane. How are velocity and acceleration components analyzed in these scenarios?	**CO-4**	**BLT-1**
Q5	Describe D'Alembert's principle and its application in kinetics. How does it simplify the analysis of forces and accelerations in rigid bodies?	**CO-4**	**BLT-3**

Assignment 5

Q1	Define the work done by a force on an object. How is work calculated and what are its units?	**CO-5**	**BLT-1**
Q2	Explain the concept of power in the context of physics. How is power related to work and energy?	**CO-5**	**BLT-1**
Q3	Define efficiency in the context of work and energy. How is efficiency calculated, and what does it indicate about a system?	**CO-5**	**BLT-2**
Q4	Distinguish between conservative and non-conservative forces. Provide examples of each and explain why this classification is important in energy analysis.	**CO-5**	**BLT-1**
Q5	State the principle of conservation of energy. How is this principle applied in analyzing mechanical systems and processes?	**CO-5**	**BLT-3**

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.

3ME4-05: Engineering Thermodynamics

Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT-I

Q1.	Define the following thermodynamic concepts: system, surroundings, and property. Provide examples to illustrate each concept.	**BLT-2**	**CO-1**
Q2.	Explain the concept of thermodynamic equilibrium. What conditions must be met for a system to achieve thermodynamic equilibrium?	**BLT-1**	**CO-1**
Q3.	Describe the Zeroth Law of Thermodynamics and its significance in establishing temperature scales. How does this law lead to the concept of thermal equilibrium?	**BLT-1**	**CO-1**
Q4.	Using the First Law of Thermodynamics, analyze an isothermal process for an ideal gas. Derive the expression for the work done during this process.	**BLT-2**	**CO-1**
Q5.	Compare and contrast steady flow energy equations and unsteady flow energy equations. Provide examples of thermodynamic systems where each type of equation would be applicable.	**BLT-3**	**CO-1**

ASSIGNMENT-II

Q1.	Explain the differences between a heat engine, a heat pump, and a refrigerator. Use the second law of thermodynamics to describe how each device operates and provide a practical example of each.	**BLT-3**	**CO-2**
Q2.	Discuss the equivalence of the Kelvin-Plank and Clausius statements of the second law of thermodynamics. Provide a detailed explanation of each statement and demonstrate their equivalence with an example.	**BLT-3**	**CO-2**
Q3.	Define reversible and irreversible processes in the context of thermodynamics. Explain why reversible processes are ideal and describe the characteristics that differentiate them from irreversible processes.	**BLT-3**	**CO-2**
Q4.	Describe the concept of entropy and its significance in thermodynamics. Calculate the entropy change for a system undergoing an isothermal expansion process. Illustrate your explanation with a Temperature-Entropy (T-S) diagram.	**BLT-2**	**CO-2**
Q5.	Define the concept of available energy and irreversibility in a thermodynamic system. Discuss how the availability function is used to determine the loss in available energy and provide an example where this analysis is crucial.	**BLT-3**	**CO-2**

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Department of Mechanical Engineering
II Year III Sem.

3ME4-05: Engineering Thermodynamics

Note: Each Assignment of Maximum marks10.All question carries equal marks

ASSIGNMENT-III

Q1.	Define a pure substance in the context of thermodynamics. Explain the concept of phase and describe the different phases a pure substance can exist in. Use water as an example to illustrate your explanation.	**BLT-2**	**CO-3**
Q2.	Discuss the importance of the p-v-T surface for a pure substance. Explain how this surface is used to represent the different phases and phase transitions. Provide a sketch of a p-v-T diagram for water.	**BLT-2**	**CO-3**
Q3.	Explain the significance of steam tables in thermodynamics. How are they used to determine the properties of steam? Give an example of how to use a steam table to find the specific volume and enthalpy of steam at a given temperature and pressure.	**BLT-4**	**CO-3**
Q4.	Compare and contrast the behavior of ideal gases and real gases. Discuss the assumptions made in the ideal gas law and explain how real gases deviate from these assumptions under high pressure and low temperature conditions.	**BLT-4**	**CO-3**
Q5.	Define Dalton's law of partial pressures and Gibbs-Dalton law. Explain how these laws are applied to determine the thermodynamic properties of gas mixtures. Provide a numerical example to illustrate the calculation of the total pressure and specific volume of a gas mixture using these laws.	**BLT-4**	**CO-3**

ASSIGNMENT-IV

Q1.	Define thermodynamic variables and distinguish between independent and dependent variables. Provide examples of each type of variable in a thermodynamic context.	**BLT-1**	**CO-4**
Q2.	Derive one of Maxwell's thermodynamic relations starting from the fundamental thermodynamic potentials. Explain its significance and provide an example of how it can be used to relate different thermodynamic properties.	**BLT-1**	**CO-4**
Q3.	Define the Joule-Thomson coefficient and describe its physical meaning. How is the Joule-Thomson effect used in practical applications such as refrigeration? Additionally, derive the Clapeyron equation and explain its significance in phase transitions.	**BLT-2**	**CO-4**
Q4.	Compare and contrast the Otto cycle, Diesel cycle, and Dual cycle in terms of their processes and efficiency. Provide the pressure-volume (p-v) and temperature-entropy (T-s) diagrams for each cycle and explain the differences in their performance.	**BLT-3**	**CO-4**
Q5.	Explain the working principles of the Brayton cycle and the Ericsson cycle. Discuss the key differences between these two cycles and their respective applications. Provide a detailed analysis of the efficiency of each cycle and the factors affecting it.	**BLT-3**	**CO-4**

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Department of Mechanical Engineering
II Year III Sem.

3ME4-05: Engineering Thermodynamics

Note: Each Assignment of Maximum marks10.All question carries equal marks

ASSIGNMENT-V

Q1. Describe the Rankine cycle and illustrate it with a T-s diagram. Discuss the effect of different operating conditions, such as boiler pressure and condenser pressure, on the efficiency of the Rankine cycle.	**BLT-3**	**CO-5**
Q2. Identify and explain the properties of an ideal working fluid for a vapor power cycle. Discuss why water is commonly used despite any deviations it may have from the ideal properties.	**BLT-3**	**CO-5**
Q3. Explain the purpose of the reheat cycle in vapor power plants. Describe how the reheat cycle improves the efficiency of the basic Rankine cycle and illustrate the process on a T-s diagram.	**BLT-3**	**CO-5**
Q4. Compare and contrast the regenerative cycle and the bleeding extraction cycle. Explain how these cycles enhance the efficiency of a steam power plant and depict each cycle on a T-s diagram.	**BLT-3**	**CO-5**
Q5. Describe the feed water heating co-generation cycle. Discuss how this cycle is implemented in practice and analyze its advantages in terms of both power generation and thermal efficiency. Provide a schematic diagram to illustrate the process.	**BLT-3**	**CO-5**

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Department of Mechanical Engineering
II Year III Sem.
3ME4-06: Material Science and Engineering
Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT--I

Q 1 Explain with neat sketches the various types of crystal imperfections	BLT-2	CO-1
Q 2 What is recovery, recrystallization and grain growth explain with suitable example like change in properties etc.	BLT-2	CO-1
Q 3 With neat sketches explain various crystal structures	BLT-1	CO-1
Q 4 Distinguish between i) Slip and twin mechanisms ii) Elastic and plastic modes of deformation iii) Hot and cold working	BLT-2	CO-1

ASSIGNMENT-II

Q 1 Classification of engineering materials on the basis of metals and non-metals.	BLT-3	CO-2
Q 2 Describe Eutectic, Peritectic, Eutectoid and peritectoid reactions.	BLT-2	CO-2
Q 3 Draw a cooling curve of pure Iron and also explain.	BLT-1	CO-2
Q 4 Explain process of solidifications process of pure metals and alloy with a time and temperature curve.	BLT-2	CO-2

ASSIGNMENT-III

Q 1 What is the objective of heat treatment process? List the various heat treatment process	BLT-2	CO-3
Q 2 Write short note: - 1. Nitriding and Cyaniding 2. Normalizing and carburizing	BLT-2	CO-3
Q 3 Differentiate 1) hardness and harden ability 2) annealing and stress relief process	BLT-2	CO-3
Q 4 Describe the Gibb's Phase rule. How this rule is applied to pure metal and binary alloys?	BLT-1	CO-3
Q 5 Describe the allotropic transformation in iron and discuss their importance in practical application?	BLT-2	CO-3

ASSIGNMENT-IV

Q 1 explain urea, and phenol formaldehydes.	BLT-2	CO-4
Q 2 write short note on ABS	BLT-2	CO-4
Q 3 what do you understand by the solid solutions	BLT-2	CO-4
Q 4 what is an alloy is and substitutional and interstitial solution	BLT-1	CO-4
Q 5 what are engineering polymers, write there properties and explain any two.	BLT-2	CO-4

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.
3ME4-06: Material Science and Engineering
Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT-V

Q 1 write short note on Si_3N_4 and PSZ	BLT-1	CO-5
Q 2 what are composites and reinforced composites.	BLT-1	CO-5
Q 3 classify steels on the basis of their constituent and properties	BLT-2	CO-5
Q 4 write short note on Hardness test (Brinel, Vickers and Rockwell)	BLT-2	CO-5
Q5 Different type of fracture	BLT-4	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

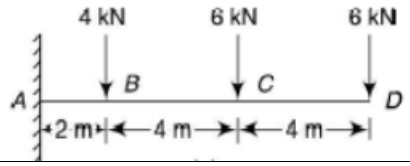
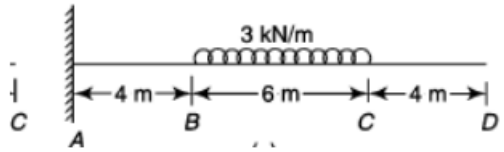
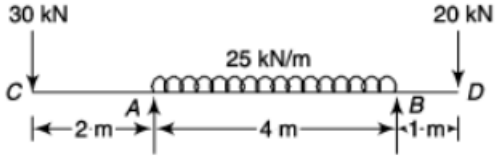
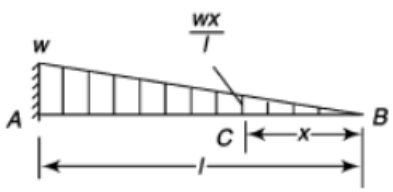
Department of Mechanical Engineering
II Year III Sem.
3ME4-07: Mechanics of Solid

Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT--I

Q1Define bulk modulus derive the relation E = 3k (1 - 2μ)	BLT-2	CO-1
Q2. What is volumetric strain. Show that it is algebraic sum of three mutually perpendicular strains.	BLT-2	CO-1
Q3. A bar of 12 mm diameter is elongated by 0.003 mm when under stress by a force of 20 KN. Find out 1. Poisson's Ratio 2. E and K (Youngs and Bulk Modulus)	BLT-1	CO-1
Q4. A composite bar made up of copper, steel and brass is rigidly attached to the end supports. Determine the stresses in the three portions of the bar when the temperature of the composite system is raised by 70^0 centigrade. 1. The supports are rigid. 2. The supports yield by 0.6 mm	BLT-3	CO-1
Q5. A Steel tube of 45 mm in external diameter and 3 mm thickness encloses centrally a solid copper bar of 30 mm diameter. The bar and the tube are rigidly connected together at the ends at a temperature of 30°C.Find the stress in each metal when heated to 180°C.Also find increase in the length, if original length of assembly is 30 mm. Coefficient of expansion of steel and copper are 1.08 $\times 10^{-5}$ and 1.7 $\times$ 10^{-5} respectively per degree centigrade. E steel = 2.1 × 10-5 N/mm^2 , Ecu = 1.1 × 10^{-5} N/mm^2 for copper	BLT-3	CO-1

ASSIGNMENT-II

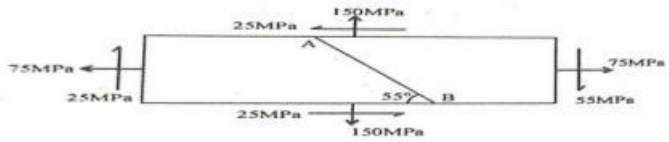
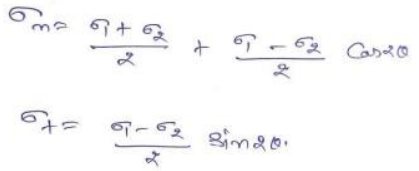
Q1. Prove the relation M/I = f /y = E/R	BLT-3	CO-2
Q2. Draw shear force and bending moment of the following 	BLT-2	CO-2
Q3. Draw shear force and bending moment of the following 	BLT-1	CO-2
Q4. Draw shear force and bending moment of the following 	BLT-2	CO-2
Q5 Draw the S.F.D and BMD for the following 	BLT-2	CO-2

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Mechanical Engineering
II Year III Sem.
3ME4-07: Mechanics of Solid

Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT-III

Q1. A short metallic column of 500 mm^2 cross sectional area carries an axial compressive load of 100 kN for a plane inclined at 60 °C with the direction of load, Calculate: (i) Normal Stress (ii) Tangential Stress (iii) Resultant Stress (iv)Maximum Shear Stress (iv) Maximum Shear Stress (v) Obliquity of resultant stress	BLT-2	CO-3
Q2Find by Mohr's circle method normal and shear stress on section AB.Also find max. shear stress: 	BLT-2	CO-3
Q3A rectangular bar is subjected to two direct stress (σ1 and σ2) in two direct mutually perpendicular directions .Prove that the normal stress (σn) and shear stress (σt) on an oblique plane which is inclined at an angle ø with the axis of minor stress are given by 	BLT-2	CO-3
Q4Derive relation for equivalent bending and twisting for shaft subjected to combined bending and twisting.	BLT-1	CO-3
Q5 Explain: (i) Maximum shear stress theory, (ii) Maximum principal strain theory.	BLT-2	CO-3

ASSIGNMENT-IV

Q1Find Euler's Crushing load for a hollow cylindrical cast from column 120 mm extreme diameter and 20 mm thick. If it is 4.2 m long and hinged at both ends. Take E = 80 kN/mm^2 . Compare this load with crushing load given by Rankine formula using constant f = 550 N/mm^2 and α = 1/1600.	BLT-2	CO-4
Q2Determine crippling load for a T- section of dimensions 12 cm ×12 cm × 2 cm and of length 6m When it is used as column with one of its end fixed and other hinged E = 2 × 105 N/mm^2 .	BLT-2	CO-4
Q3Derive the torsion equation for the solid circular shaft.	BLT-2	CO-4
Q4A hollow shaft, having an inside diameter 60% of its outer diameter is to replace a solid shaft transmitting the same power at the same speed. Calculate, the percentage saving in material, if the material to be used is same in both the cases.	BLT-1	CO-4
Q5A solid shaft of 250 mm diameter has the same cross sectional area as the hollow shaft of the same material with inside diameter 150 mm. (i) Find the ration of power transmitted by the two shafts for the same angular velocity. (ii) Compare the angle of twist in equal lengths of these shafts when subjected to the same torque	BLT-2	CO-4

*BLT: BLT shows the **Bloom's taxonomy** levels.

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Note: Each Assignment of Maximum marks10.All question carries equal marks.

ASSIGNMENT-V

Q1A Thin cylindrical pressure vessel of 500 mm diameter is subjected to an internal pr. of 2 N/mm^2 , If the thickness of vessel is 20 mm, find the hoop stress, longitudinal stress and maximum shear stress.	BLT-1	CO-5
Q2Derive differential equation for deflection: EI d^2y/dx^2 = M.	BLT-1	CO-5
Q3A simply supported beam subjected to a uniformly distributed load w over its entire span. Determine the maximum slope and deflection by double integration method.	BLT-2	CO-5
Q4Prove that the deflection at center of simply supported beam, carrying a point load at the center is given by, yc = WL3 /48EI where, W= Point load, L= Length of beam, E= Elastic constant, I= Moment of inertia.	BLT-2	CO-5
Q5A steel cantilever of span 2.5 m carries a point load of W kN at its free end. The moment of inertia for the section of the cantilever is 9900 cm^4 . If the deflection at the free end is not to exceed 0.75 cm, what must be the value of W? Take E= 210 GN/m2	BLT-4	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.