

Module – 4					
Q.7	a.	With neat sketches explain (i) Spur gear (ii) Bevel gear (iii) Rack and pinion gear.	09	L2	CO3
	b.	With a neat sketch explain the principle and working of tungsten Inert Gas Welding.	06	L2	CO2
	c.	A simple gear train consists of 3 gears. Driving gear has 60 teeth, with roller gear 40 teeth and 80 teeth on driven gear. If driving gear rotates at 1200 rpm in anticlockwise direction, find the speed of the gears and velocity ratio. Sketch the arrangement.	05	L3	CO4
OR					
Q.8	a.	What is gas welding? Explain with neat sketch on operation of oxy-acetylene gas welding.	10	L2	CO2
	b.	Derive an expression for length of open belt drive system.	10	L3	CO4
Module – 5					
Q.9	a.	With the help of a line diagram explain the working of a hybrid vehicle.	10	L2	CO3
	b.	List the applications of robot.	06	L2	CO3
	c.	List the advantages and disadvantages of electric vehicles.	04	L2	CO3
OR					
Q.10	a.	With suitable example explain the concept of open and closed loop system.	12	L2	CO3
	b.	Briefly explain robot anatomy with neat sketch.	08	L2	CO3

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18ME15/25

First/Second Semester B.E. Degree Examination, June/July 2023 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of steam tables is permitted.**

Module-1

- 1 a. Define the term fuel. Write a note on solid fuels. (06 Marks)
b. With the help of neat diagram, explain the construction and working nuclear power plant. (08 Marks)
c. Write notes on the following: (i) Ozone depletion (ii) Global warming (06 Marks)

OR

- 2 a. Define the term thermodynamics. State first and second law of thermodynamics. (06 Marks)
b. With the help of a Temperature-Enthalpy (T-h) diagram, explain the formation of steam at a constant pressure. (06 Marks)
c. 5 kg of wet steam of dryness 0.8 passes from a boiler to a super heater at a constant pressure of 1 MPa absolute. In the superheater its temperature increases to 350°C. Determine the amount of heat supplied in the superheater. The specific heat of superheated steam $C_{ps} = 2.25 \text{ kJ/kgK}$. (08 Marks)

Module-2

- 3 a. Define the term boiler. Classify the boilers. (06 Marks)
b. With the help of a neat sketch, explain the construction and working of a Babcock and Wilcox boiler. Indicate clearly flow of flue gases. (10 Marks)
c. List the boiler mountings. (04 Marks)

OR

- 4 a. Define the term prime mover. Explain the principle of working of impulse and reaction turbine. (06 Marks)
b. With the help of neat sketch, explain the construction and working of Francis turbine. (08 Marks)
c. What is meant by cavitation and priming? (06 Marks)

Module-3

- 5 a. Define the term Internal Combustion Engine. Classify the Internal Combustion Engine. (06 Marks)
b. With the help of PV diagram, explain the working of four stroke diesel engine. (08 Marks)
c. Explain the desirable properties of an ideal refrigerant. (06 Marks)

OR

- 6 a. Explain the working of a vapour absorption refrigeration system with neat sketch. (07 Marks)
b. The following readings were taken on a four stroke I.C. engine:
Diameter of the brake drum = 1.5 m Diameter of the rope = 10 mm
Load suspended on the brake drum = 100 kg Spring balance reading = 5 kg
Crankshaft speed = 200 rpm
Determine the brake power of the engine. (07 Marks)
c. With the help of neat sketch, explain the working of room air conditioner. (06 Marks)

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. What are the properties of cast iron and aluminium? (08 Marks)
b. Differentiate between welding, brazing and soldering. (06 Marks)
c. Write a note on smart materials. (06 Marks)

OR

- 8 a. With the help of neat sketch, explain Tungsten Inert Gas (TIG) Welding. (06 Marks)
b. Obtain an expression for the ratio of tensions in case of flat belt. (07 Marks)
c. List the advantages and disadvantages of gear drives over belt drives. (07 Marks)

Module-5

- 9 a. With neat sketch, highlight the specification of lathe. (06 Marks)
b. With the help of neat sketch, explain taper turning by tailstock set over method. (06 Marks)
c. Explain briefly, with the help of neat sketches, following operations:
(i) Straddle milling (ii) Gang milling
(iii) Slab milling (iv) Angular milling (08 Marks)

OR

- 10 a. Define the term Computer Numerical Control (CNC). Explain the basic components of CNC. (06 Marks)
b. Define the term manipulator. Briefly explain the five type of joints that are used in industrial robot construction. (08 Marks)
c. List the industrial robot application in the processing operations. (06 Marks)

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18ME15/25

First/Second Semester B.E. Degree Examination, July/August 2021 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer any FIVE full questions.
2. Use of Thermodynamics data hand book is permitted.
3. Use of steam tables is permitted.

- 1
 - a. Explain briefly the principle of power plant with a neat sketch. (10 Marks)
 - b. Write a note on following solar energy technologies:
 - (i) Photovoltaic technology
 - (ii) Flat plate collector (10 Marks)

- 2
 - a. Briefly describe steam formation with the help of T-H diagram. (10 Marks)
 - b. Find the enthalpy of 1 kg of steam at 12 bar when (i) Steam in dry saturated (ii) Steam is 22% wet (iii) super heated to 250°C. Use the steam table. Assume the specific heat of the super heated steam as 2.25 kJ/kgK. (06 Marks)
 - c. Define the following: (i) Sensible heat (ii) Degree of superheat. (04 Marks)

- 3
 - a. Explain the working principle of Lancashire boiler with neat sketch. (10 Marks)
 - b. Explain how to classify the water turbine. (04 Marks)
 - c. Differentiate between pelton wheel turbine and Kaplan turbine. (06 Marks)

- 4
 - a. With a neat sketch, explain the working principle of centrifugal pump. (10 Marks)
 - b. Explain the working principle of Kaplan turbine with a neat sketch. (10 Marks)

- 5
 - a. Differentiate between SI engine and CI engine. (04 Marks)
 - b. Explain the working principle of 4-stroke SI engine with P-V diagram. (10 Marks)
 - c. A 2 stroke C.I. engine has a cylinder diameter of 200 mm and stroke length of 300 mm. The engine has a mean effective pressure of 2.8 bar and a speed of 400 rpm. The effective diameter of break drum is 1 m and effective load on it is 64 kg. Determine the following :
 - (i) IP (ii) BP (iii) Mechanical efficiency (06 Marks)

- 6
 - a. Define the following:
 - (i) Refrigeration
 - (ii) Refrigerating effect
 - (iii) Ton of refrigeration
 - (iv) Ice making capacity (08 Marks)
 - b. Differentiate between VCR and VAR. (06 Marks)
 - c. Explain the working of room air condition system with a neat sketch. (06 Marks)

- 7
 - a. Write a note on classification and application of ferrous and nonferrous metals. (10 Marks)
 - b. Define the following:
 - (i) Welding
 - (ii) Brazing
 - (iii) Soldering (06 Marks)
 - c. Define composite material. Mention any two applications. (04 Marks)

- 8 a. Derive an equation for length of belt in cross belt drive. (10 Marks)
b. Write a note on velocity ratio of belt drive. (04 Marks)
c. A gear wheel of 20 teeth drives another gear wheel having 36 teeth running at 200 rpm, find the speed of the driving wheel and the velocity ratio. (06 Marks)
- 9 a. Explain the following operations on lathe with suitable sketches:
(i) Facing
(ii) Thread cutting
(iii) Plain turning
(iv) Knurling (08 Marks)
b. Explain the following operations on milling machines with suitable sketches:
(i) Plain milling
(ii) Slot milling
(iii) Straddle milling
(iv) Gang milling (08 Marks)
c. Explain taper turning by compound slide swiveling method with sketch. (04 Marks)
- 10 a. Explain the basic components of CNC machine with a block diagram. (10 Marks)
b. What are the applications of Robots and also write down the advantages of robots. (10 Marks)

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18ME15/25

First/Second Semester B.E. Degree Examination, Dec.2023/Jan.2024 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of steam tables permitted.*

Module-1

- 1 a. What are renewable and non renewable energy sources? Give examples. (04 Marks)
- b. With temperature enthalpy diagram, explain the formation of steam at constant pressure. (08 Marks)
- c. State Zeroth law of thermodynamics. List similarities between work and heat. (08 Marks)

OR

- 2 a. What are the different states of steam? (04 Marks)
- b. Explain with a sketch working of a solar flat plate collector. (08 Marks)
- c. Find the enthalpy and specific volume of 1kg of steam at 10 bar when:
 - i) Steam is wet having dryness fraction 0.8.
 - ii) Steam is dry saturated.
 - iii) Steam is superheated to 300°C.The specific heat of superheated steam is 2.25kJ/kg K. (08 Marks)

Module-2

- 3 a. Explain with a sketch working of Babcock and Wilcox boiler. (10 Marks)
- b. Explain with a sketch working of reciprocating pump. (10 Marks)

OR

- 4 a. Explain with a sketch working of Pelton wheel turbine. (10 Marks)
- b. Explain the functions of:
 - i) Water level indicator
 - ii) Pressure gauge
 - iii) Safety valve
 - iv) Economizer
 - v) Superheater. (10 Marks)

Module-3

- 5 a. Explain with a PV diagram working of 4 stroke diesel engine. (10 Marks)
- b. Explain with a sketch working of vapour absorption refrigerating system. (10 Marks)

OR

- 6 a. Define terms:
 - i) Refrigerant
 - ii) Refrigerating effect
 - iii) Ton of refrigeration
 - iv) COP
 - v) Relative COP. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- b. How are IC engines classified? (05 Marks)
c. A 2 stroke diesel engine has a piston diameter of 200mm and stroke of 300mm. The mean effective pressure is 2.8 bar and a speed of 400rpm. The diameter of brake drum is 1m and effective brake load is 64kg. Find the indicated power, brake power, mechanical efficiency and average piston speed. (10 Marks)

Module-4

- 7 a. How are composites classified? (04 Marks)
b. Explain with a sketch process of arc welding. (08 Marks)
c. Classify and explain various types of steel. (08 Marks)

OR

- 8 a. Briefly explain the following gear drives with a neat sketch: i) Spur gear ii) Helical gear (04 Marks)
b. Derive an expression for length of belt in an open belt drive. (08 Marks)
c. A shaft running at 150rpm is to drive a parallel shaft at 225rpm. Pulley on the driving shaft has a diameter of 35cms. Find the diameter of driven pulley, velocity ratio, linear velocity of the belt. (08 Marks)

Module-5

- 9 a. Explain with a sketch method of taper turning on lathe by swiveling of compound rest. (10 Marks)
b. Define Robot. Explain with a sketch working of Cartesian co-ordinate robot. (10 Marks)

OR

- 10 a. Explain with sketch following operations on milling machine i) Plain milling ii) End milling iii) Slot milling iv) Form milling. (10 Marks)
b. Discuss the elements of CNC system with neat block diagrams. (10 Marks)

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18ME15/25

First/Second Semester B.E. Degree Examination, Dec.2023/Jan.2024 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of steam tables permitted.*

Module-1

- 1 a. What are renewable and non renewable energy sources? Give examples. (04 Marks)
 b. With temperature enthalpy diagram, explain the formation of steam at constant pressure. (08 Marks)
 c. State Zeroth law of thermodynamics. List similarities between work and heat. (08 Marks)

OR

- 2 a. What are the different states of steam? (04 Marks)
 b. Explain with a sketch working of a solar flat plate collector. (08 Marks)
 c. Find the enthalpy and specific volume of 1kg of steam at 10 bar when:
 i) Steam is wet having dryness fraction 0.8.
 ii) Steam is dry saturated.
 iii) Steam is superheated to 300°C.
 The specific heat of superheated steam is 2.25kJ/kg K. (08 Marks)

Module-2

- 3 a. Explain with a sketch working of Babcock and Wilcox boiler. (10 Marks)
 b. Explain with a sketch working of reciprocating pump. (10 Marks)

OR

- 4 a. Explain with a sketch working of Pelton wheel turbine. (10 Marks)
 b. Explain the functions of :
 i) Water level indicator
 ii) Pressure gauge
 iii) Safety valve
 iv) Economizer
 v) Superheater. (10 Marks)

Module-3

- 5 a. Explain with a PV diagram working of 4 stroke diesel engine. (10 Marks)
 b. Explain with a sketch working of vapour absorption refrigerating system. (10 Marks)

OR

- 6 a. Define terms:
 i) Refrigerant
 ii) Refrigerating effect
 iii) Ton of refrigeration
 iv) COP
 v) Relative COP. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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- b. How are IC engines classified? (05 Marks)
- c. A 2 stroke diesel engine has a piston diameter of 200mm and stroke of 300mm. The mean effective pressure is 2.8 bar and a speed of 400rpm. The diameter of brake drum is 1m and effective brake load is 64kg. Find the indicated power, brake power, mechanical efficiency and average piston speed. (10 Marks)

Module-4

- 7 a. How are composites classified? (04 Marks)
- b. Explain with a sketch process of arc welding. (08 Marks)
- c. Classify and explain various types of steel. (08 Marks)

OR

- 8 a. Briefly explain the following gear drives with a neat sketch: i) Spur gear ii) Helical gear (04 Marks)
- b. Derive an expression for length of belt in an open belt drive. (08 Marks)
- c. A shaft running at 150rpm is to drive a parallel shaft at 225rpm. Pulley on the driving shaft has a diameter of 35cms. Find the diameter of driven pulley, velocity ratio, linear velocity of the belt. (08 Marks)

Module-5

- 9 a. Explain with a sketch method of taper turning on lathe by swiveling of compound rest. (10 Marks)
- b. Define Robot. Explain with a sketch working of Cartesian co-ordinate robot. (10 Marks)

OR

- 10 a. Explain with sketch following operations on milling machine i) Plain milling ii) End milling iii) Slot milling iv) Form milling. (10 Marks)
- b. Discuss the elements of CNC system with neat block diagrams. (10 Marks)

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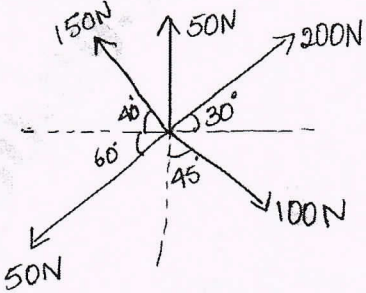
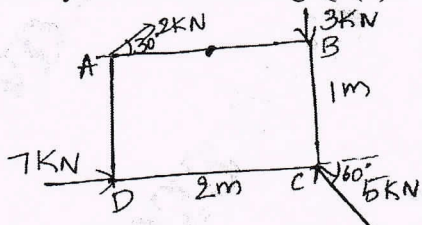
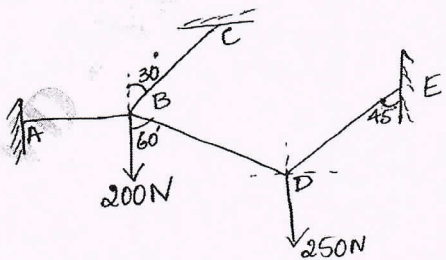
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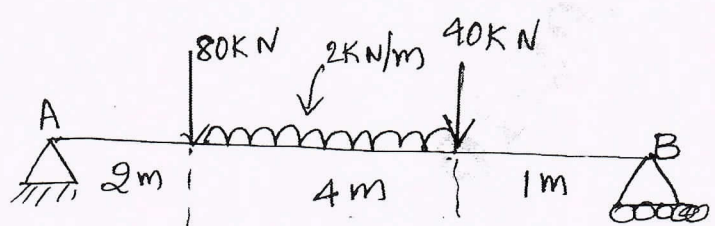
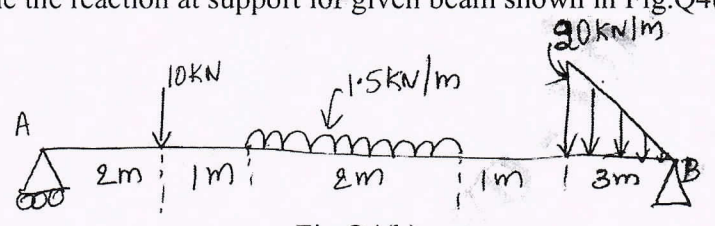
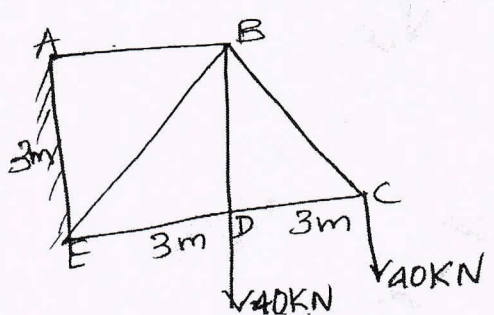
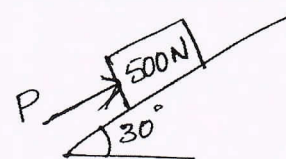
First/Second Semester B.E./B.Tech. Degree Examination, June/July 2023 Engineering Mechanics

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define Couple. Explain characteristics of Couple.	5	L2	CO1
	b.	Determine the magnitude and direction of resultant for given concurrent force system as shown in Fig.Q1(b). <div style="text-align: center;">  <p style="text-align: center;">Fig.Q1(b)</p> </div>	7	L3	CO1
	c.	Explain classification of force system with neat diagram.	8	L2	CO1
OR					
Q.2	a.	State and prove Varignon's theorem.	7	L2	CO1
	b.	Find the magnitude, direction and position of the resultant with respect to the point A for the force system shown in Fig.Q2(b). <div style="text-align: center;">  <p style="text-align: center;">Fig.Q2(b)</p> </div>	10	L3	CO1
	c.	Explain principle of transmissibility of force.	3	L2	CO1
Module – 2					
Q.3	a.	State and prove Lamis theorem.	6	L2	CO1
	b.	Explain the condition of equilibrium of coplanar concurrent and non concurrent force system.	5	L2	CO1
	c.	The system of connected flexible cable as shown in Fig.Q3(c) two vertical forces 200 N and 250 N at B and D. Determine the forces in various segments of the cable. <div style="text-align: center;">  <p style="text-align: center;">Fig.Q3(c)</p> </div>	9	L3	CO1

OR					
Q.4	a.	Explain different types of beam with neat sketch.	6	L2	CO1
	b.	A beam carries load as shown in Fig.Q4(b). Determine reaction at the supports. <div style="text-align: center;">  <p>Fig.Q4(b)</p> </div>	7	L3	CO1
Q.4	c.	Determine the reaction at support for given beam shown in Fig.Q4(c). <div style="text-align: center;">  <p>Fig.Q4(b)</p> </div>	7	L3	CO1
	Module – 3				
Q.5	a.	Explain different type of truss with sketch.	5	L2	CO2
	b.	Write short notes on method of sections.	4	L2	CO2
Q.5	c.	Find forces in all the members of the truss shown in Fig.Q5(c). Tabulate the results and indicate the magnitude and nature of forces on the diagram of truss. <div style="text-align: center;">  <p>Fig.Q5(c)</p> </div>	11	L3	CO2
	OR				
Q.6	a.	Explain : (i) Angle of friction (ii) Angle of Repose (iii) Laws of friction (iv) Co-efficient of friction.	8	L2	CO3
	b.	For the block shown in Fig.Q6(b), determine force P required to push the block up the plane take $\mu = 0.25$ for all contact surface refer Fig.Q6(b). <div style="text-align: center;">  <p>Fig.Q6(b)</p> </div>	6	L3	CO3

	<p>c. A ladder of 3m length and weighing 200 N is placed on wall at an inclination of 60° which is as shown in Fig.Q6(c) and coefficient of friction between ladder and wall is 0.28 and between ladder and floor is 0.34. A man weighing 600 N is to reach the top of ladder. Calculate the horizontal force P to be applied to the ladder at floor level to prevent ladder from slipping.</p>	6	L3	CO3
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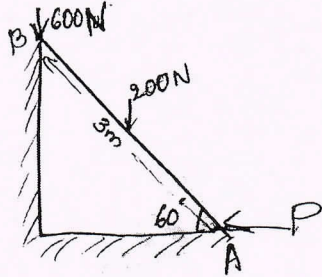


Fig.Q6(c)

Module - 4

Q.7	<p>a. Locate centroid of triangle with base B and height h by the method of integration.</p>	8	L2	CO4
	<p>b. Locate the centroid for the shaded part with respect to reference x and y axis Fig.Q7(b).</p>	12	L3	CO4

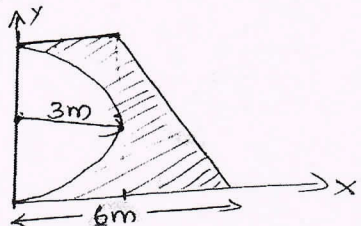


Fig.Q7(b)

OR

Q.8	<p>a. Explain perpendicular axis theorem.</p>	5	L2	CO4
	<p>b. Locate moment of inertia of rectangle about its horizontal centroidal axis by method of integration.</p>	7	L2	CO4
	<p>c. Calculate least radius of gyration for the section shown in Fig.Q8(c).</p>	8	L3	CO4

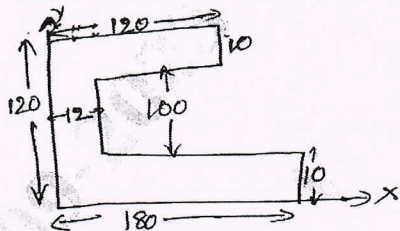


Fig.Q8(c) All dimensions are in mm

Module - 5

Q.9	<p>a. Define: (i) Displacement (ii) Speed (iii) Velocity (iv) Acceleration</p>	8	L2	CO5
	<p>b. Derive all three basic equation of motion.</p>	6	L2	CO5
	<p>c. A car starts from rest and accelerates uniformly to a speed of 75 kmph over a distance of 1000 m. Find acceleration of car and time taken to attain this speed.</p>	6	L3	CO5

OR

Q.10	<p>a. Explain D'Alembert's principle of equilibrium.</p>	6	L2	CO5
	<p>b. Explain: (i) Angle of projection (ii) Time of flight (iii) Vertical height</p>	6	L2	CO5
	<p>c. A projectile is projected from a point at an angle of elevation of 30° with a velocity of 600 m/sec, find the velocity and direction of motion of particle at the end of (i) 25 seconds (ii) 40 seconds</p>	8	L3	CO5

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21EME15/25

First/Second Semester B.E. Degree Examination, Jan./Feb. 2023

Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of thermodynamic data handbook is permitted.*

Module-1

- 1 a. Explain the formation of steam with the help of Temperature – Enthalpy [T – H] diagram. ✓
(10 Marks)
- b. With a neat sketch explain, construction and working principle of Hydel power plant. ✓
(10 Marks)

OR

- 2 a. Find the enthalpy of 2 kg of steam at 12 bar when
i) Steam is dry saturated
ii) Steam is 85% dry
iii) Superheated at 250°C
Assume the specific heat of superheated steam as 2.25 kJ/kg-K. (10 Marks)
- b. With a neat sketch explain the working principle of Pelton turbine. (10 Marks)

Module-2

- 3 a. Write a note on:
i) Piezo - electric materials
ii) Glass
iii) Semi-conductors
iv) Shape-memory alloys (08 Marks)
- b. Differentiate between soldering, brazing and welding processes. (12 Marks)

OR

- 4 a. With the help of neat sketch explain Oxy-acetylene gas welding process. (10 Marks)
- b. Write a note on three modes of heat transfer phenomena. (10 Marks)

Module-3

- 5 a. Explain with the help of theoretical P-V diagram working of four stroke diesel engine. ✓
(10 Marks)
- b. Define the following :
i) Refrigeration process
ii) Refrigeration effect
iii) Ton of refrigeration
iv) COP
v) Air-conditioning process. (10 Marks)

OR

- 6 a. List and explain the desirable properties of a good refrigerant. (10 Marks)
- b. With the help of neat sketch, explain the working principle of room air-conditioning system. (10 Marks)

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Define velocity ratio of belt drives. Explain with a neat sketch open belt drive. (10 Marks)
b. Define Machines and Mechanisms. Enumerate the applications of linear motion, oscillatory motion and rotary motion. (10 Marks)

OR

- 8 a. Give a brief comparison between belt drive and gear drive. (06 Marks)
b. Write a note on :
i) Spur Gear ii) Bevel Gear (04 Marks)
c. Define Robotics. With a neat sketch explain Jointed-arm configuration robot. (10 Marks)

Module-5

- 9 a. With a help of necessary sketches explain the following lathe operations :
i) Turning
ii) Facing
iii) Knurling
iv) Taper turning by swivelling compound rest. (12 Marks)
b. Explain the components of CNC machine with a neat block diagram. (08 Marks)

OR

- 10 a. Explain with a neat sketch the following operations:
i) Plane milling
ii) End milling
iii) Drilling
iv) Boring (12 Marks)
b. Define mechatronics. With a neat block diagram explain closed loop control system. (08 Marks)

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21EME15/25

First/Second Semester B.E. Degree Examination, Jan./Feb. 2023

Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of thermodynamic data handbook is permitted.*

Module-1

- 1 a. Explain the formation of steam with the help of Temperature – Enthalpy [T – H] diagram. (10 Marks)
- b. With a neat sketch explain, construction and working principle of Hydel power plant. (10 Marks)

OR

- 2 a. Find the enthalpy of 2 kg of steam at 12 bar when
i) Steam is dry saturated
ii) Steam is 85% dry
iii) Superheated at 250°C
Assume the specific heat of superheated steam as 2.25 kJ/kg-K. (10 Marks)
- b. With a neat sketch explain the working principle of Pelton turbine. (10 Marks)

Module-2

- 3 a. Write a note on:
i) Piezo - electric materials
ii) Glass
iii) Semi-conductors
iv) Shape-memory alloys (08 Marks)
- b. Differentiate between soldering, brazing and welding processes. (12 Marks)

OR

- 4 a. With the help of neat sketch explain Oxy-acetylene gas welding process. (10 Marks)
- b. Write a note on three modes of heat transfer phenomena. (10 Marks)

Module-3

- 5 a. Explain with the help of theoretical P-V diagram working of four stroke diesel engine. (10 Marks)
- b. Define the following :
i) Refrigeration process
ii) Refrigeration effect
iii) Ton of refrigeration
iv) COP
v) Air-conditioning process. (10 Marks)

OR

- 6 a. List and explain the desirable properties of a good refrigerant. (10 Marks)
- b. With the help of neat sketch, explain the working principle of room air-conditioning system. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Define velocity ratio of belt drives. Explain with a neat sketch open belt drive. (10 Marks)
b. Define Machines and Mechanisms. Enumerate the applications of linear motion, oscillatory motion and rotary motion. (10 Marks)

OR

- 8 a. Give a brief comparison between belt drive and gear drive. (06 Marks)
b. Write a note on :
i) Spur Gear ii) Bevel Gear (04 Marks)
c. Define Robotics. With a neat sketch explain Jointed-arm configuration robot. (10 Marks)

Module-5

- 9 a. With a help of necessary sketches explain the following lathe operations :
i) Turning
ii) Facing
iii) Knurling
iv) Taper turning by swivelling compound rest. (12 Marks)
b. Explain the components of CNC machine with a neat block diagram. (08 Marks)

OR

- 10 a. Explain with a neat sketch the following operations:
i) Plane milling
ii) End milling
iii) Drilling
iv) Boring (12 Marks)
b. Define mechatronics. With a neat block diagram explain closed loop control system. (08 Marks)
