





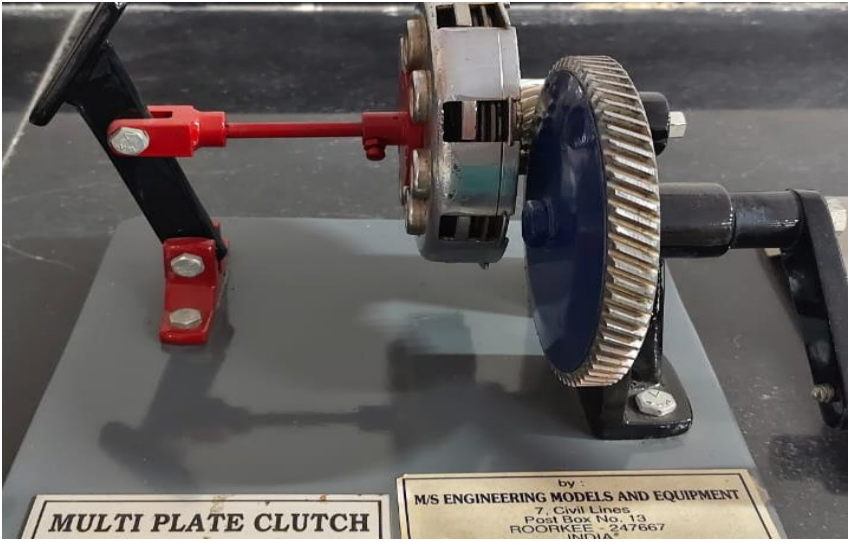



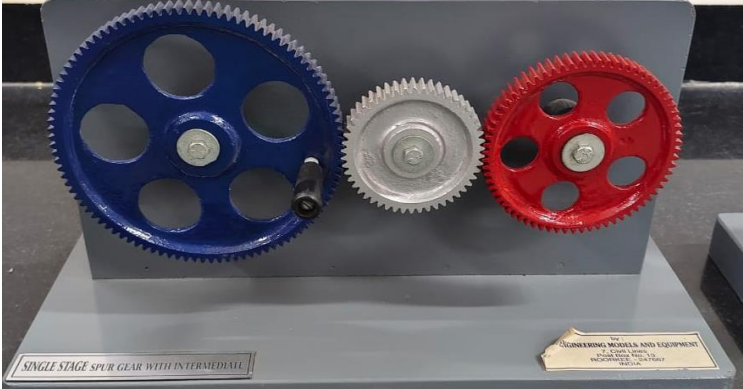




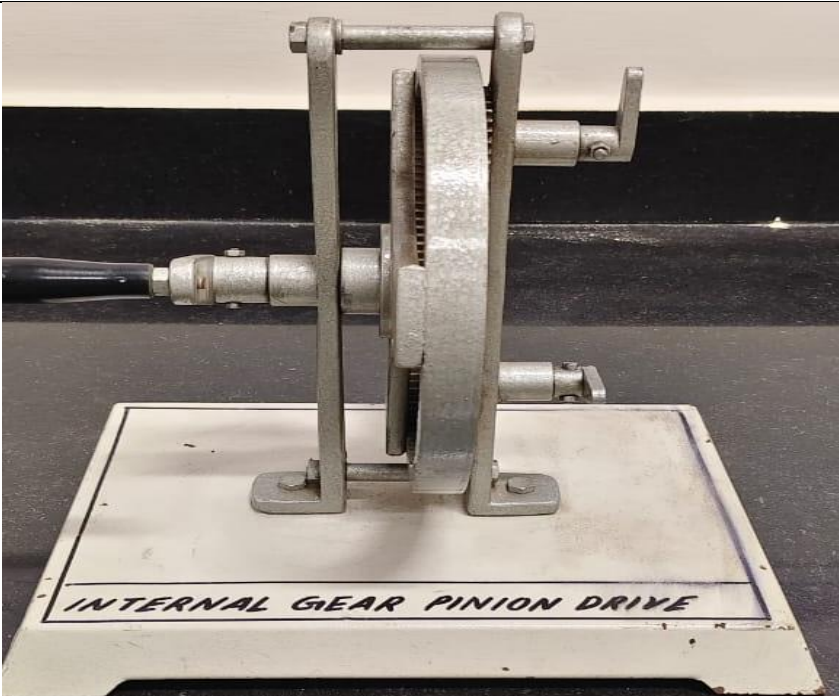


THEORY OF MACHINES LABORATORY
DEPARTMENT OF MECHANICAL ENGINEERING
COLLEGE OF TECHNOLOGY

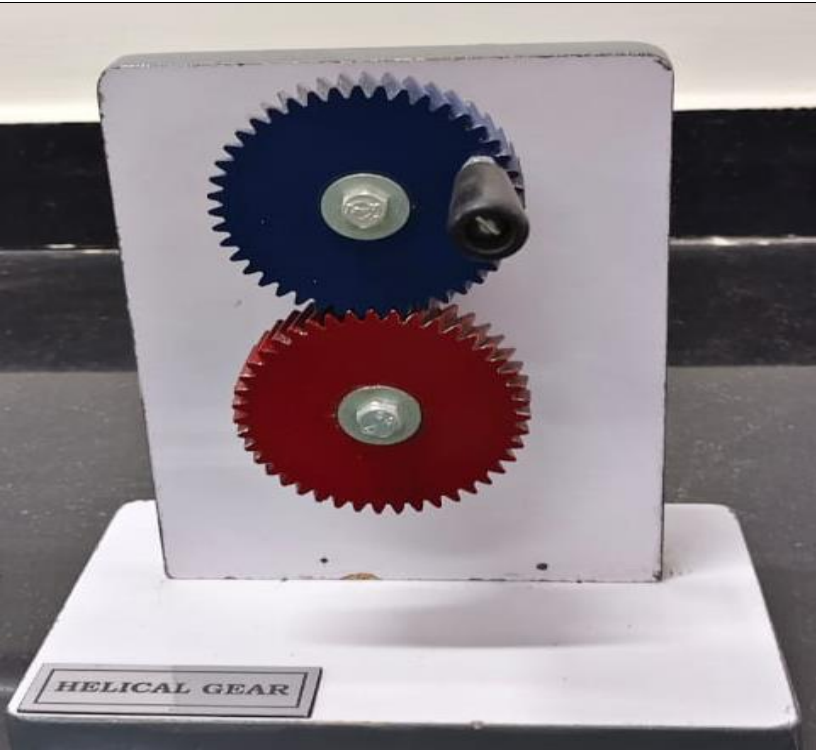



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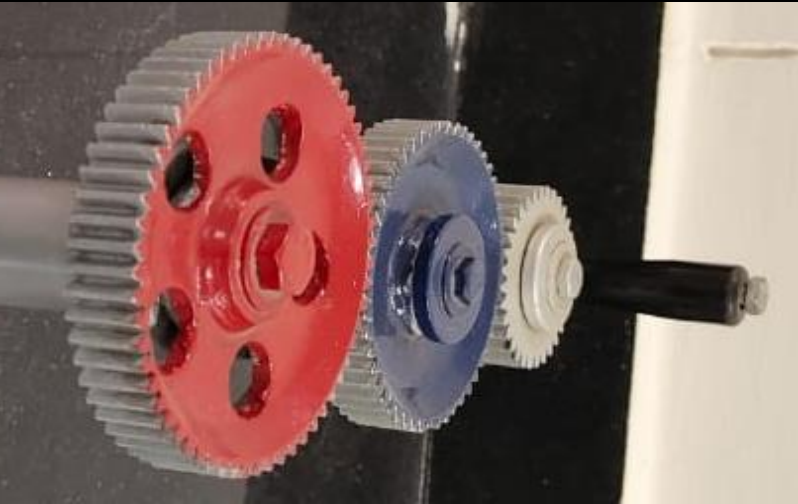


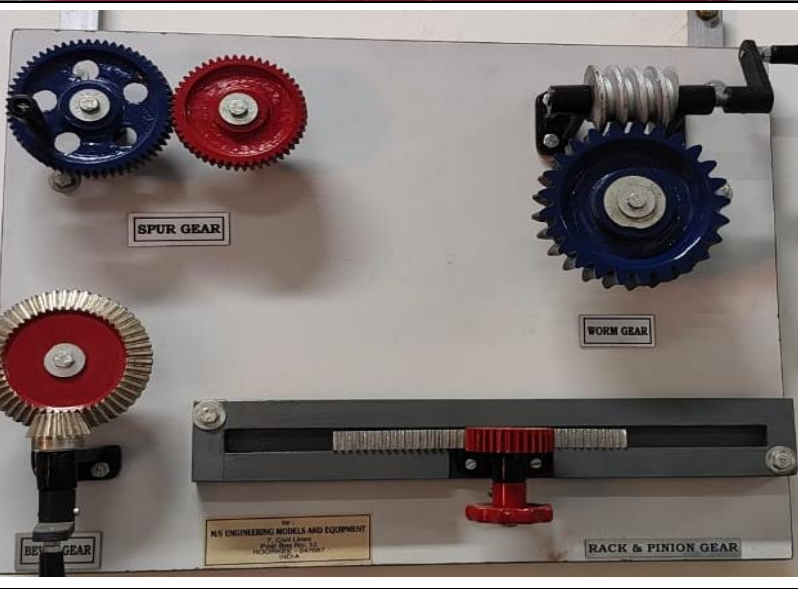
List of Equipment






Sr. No.	NAME OF EQUIPMENT	TECHNICAL SPECIFICATIONS	PICTURE OF EQUIPMENT/MODEL/DEVICE
1.	Epicyclic Gear Train Apparatus	Motor driven with all accessories to measure holding torque	 A blue metal frame supporting a motor-driven epicyclic gear train. A control panel on the right features a voltmeter, an ammeter, and a large circular scale for torque measurement.
2.	Centrifugal Clutch	Model consists of a drum pulley mounted on the output shaft. The input shaft carrying spring controlled fly weights. The working can be demonstrated by rotating the input shaft provided with crank handle. The output shaft rotates with clutch action	 A blue metal model of a centrifugal clutch mounted on a white base. It features a central drum pulley and a crank handle for manual operation. A label at the bottom reads "CENTRIFUGAL".
3.	Claw Clutch	Model is having a sliding groove. A metallic model mounted on base with operating lever	 A metallic model of a claw clutch mounted on a wooden base. It has a red sliding component and a black operating lever. A label at the bottom reads "CLAW CLUTCH".
4.	Cone Clutch	Model is having sliding groove. A metallic model mounted on base with operating lever.	 A metallic model of a cone clutch mounted on a white base. It features a blue sliding component and a red operating lever. A label at the bottom reads "CONICAL CLUTCH MODEL".

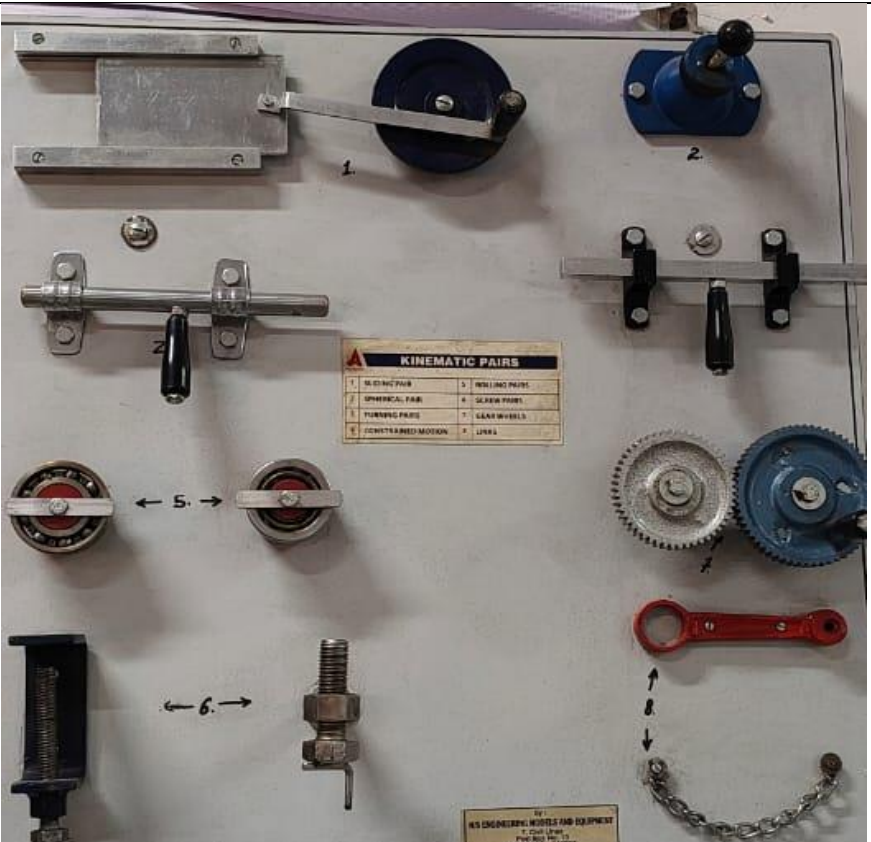

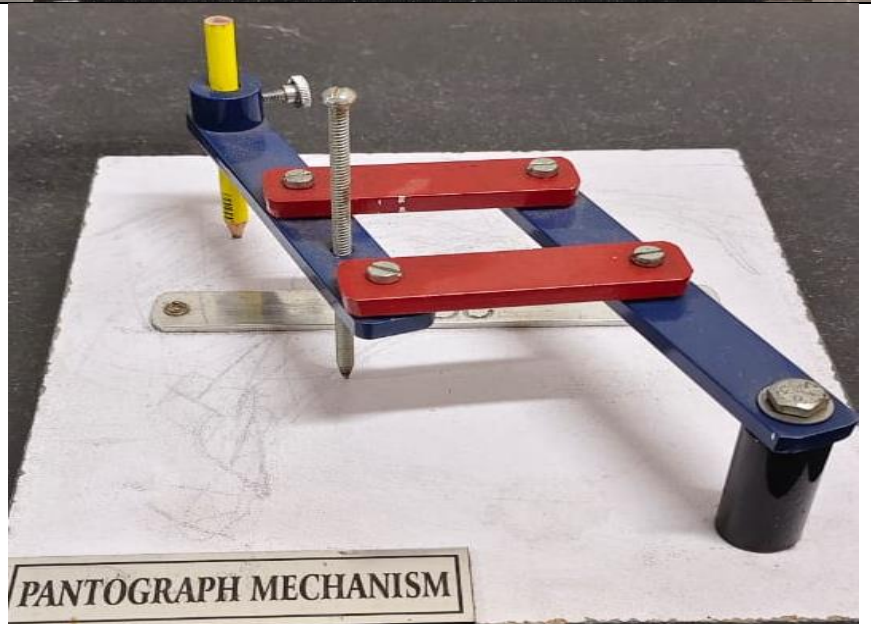

5.	Multi Plate Clutch	A metallic model mounted arrangement	
6.	Single Plate Clutch	A metallic model, mounted on base with operating lever	
7.	Universal Governor Apparatus	<p>Determination of characteristic curve of governor (spindle) speed against sleeve displacement.</p> <p>To study the effect of varying the mass of the center sleeve in Porter and Proell governor</p> <p>To study the effect of varying the initial spring compression in Hartnell Governor</p> <p>To study the determination of characteristic curves of radius of rotation against controlling force.</p> <ul style="list-style-type: none">• Drive Unit: DC Motor ¼ HP 0-1500 RPM 220 V.• Speed Control: Single phase AC 230 V Motor	
8.	Single Stage Spur Gears (Simple Train of Gear)	Model is having teeth parallel to the axis of gears. The model is mounted on a wooden board.	
9.	Single Stage Spur Gears with Intermediate Gear	The model is mounted on a wooden board.	


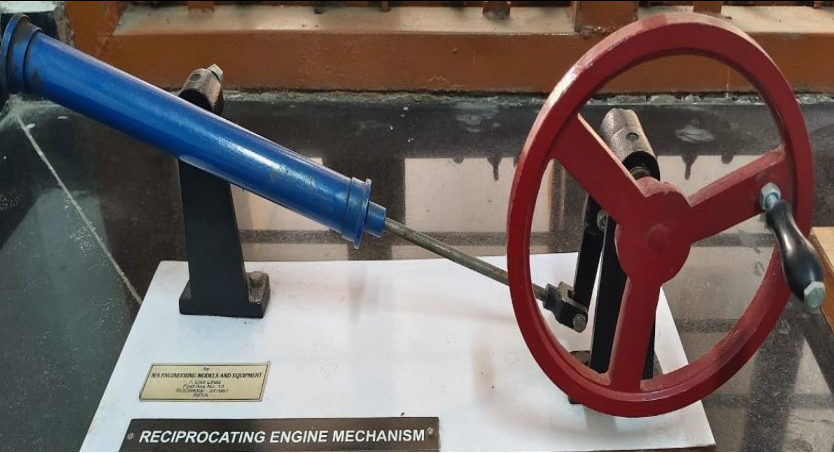


10.	Two Stage Spur Gears (Compound Train of Gears)	The model is mounted on a wooden board.	 A photograph of a two-stage spur gear model. It features three gears: a large blue gear on the left, a medium silver gear in the middle, and a small red gear on the right. They are mounted on a grey metal frame with a wooden base. A label at the bottom left reads "TWO STAGE SPUR GEAR".
11.	Three Stage Spur Gears (Compound Train of Gears)	The model is mounted on a wooden board.	 A photograph of a three-stage spur gear model. It features four gears: a large silver gear on the left, followed by two medium blue gears, and a small silver gear on the right. They are mounted on a white metal frame with a wooden base. A label at the bottom left reads "THREE STAGE SPUR GEAR".
12.	Internal Gear with Pinion Drive	The model is mounted on a wooden board.	 A photograph of an internal gear pinion drive model. It shows a large internal gear meshing with a smaller pinion. The assembly is mounted on a white metal frame with a wooden base. A label at the bottom reads "INTERNAL GEAR PINION DRIVE".
13	Spur Rack and Pinion	The model is mounted on a wooden board	 A photograph of a rack and pinion gear model. It features a red pinion gear meshing with a silver rack gear. The assembly is mounted on a grey metal frame with a wooden base. A label at the bottom left reads "RACK & PINION GEAR".
14.	Bevel Gears	Single Stage Bevel Gear. The model is mounted on a wooden board	 A photograph of a single stage bevel gear model. It features a large black bevel gear meshing with a smaller silver bevel gear. The assembly is mounted on a white metal frame with a wooden base. A label at the bottom reads "BEVEL GEAR".


15.	Single Stage Helical Gear	The model is mounted on a wooden board.	
16	Double Stage Helical Gear (Herringbone Gear)	The model is mounted on a wooden board.	
17.	Single Stage Spiral Gears	The model is mounted on a wooden board.	
18.	Worm Gear	The model is mounted on a wooden board.	

19.	Train of Gear Wheels (Sets)	This will be consisting of (a) Gear train apparatus with adjustable reference pointer (b) Set of 4 gears having the following number of teeth: 50 teeth, 100 teeth, 60 teeth and 75 teeth	
20.	Epicyclic Gear	Model consists of three gears and a train arm. The model is mounted on a wooden board.	
21.	Epicyclic Gear Box (Sun and Planet Type)	The metallic model consists of a sun gear, arm and a planetary gear inside a casing.	
22.	Differential Gear	Actual Model shows the action of differential gear	
23.	Interconnected Gears	Model consists of interconnected gears namely spur gear, Bevel gear, Worm gear and Rack and pinion.	

24.	Crank and Connecting Rod Model	Model shows the turning effect on the crank and the linear stress along with the connecting rod on the slide bar (with graduated scale).	 <p>A mechanical model showing a red crank disk connected to a black connecting rod, which is attached to a black slide bar with a graduated scale. The model is mounted on a white base.</p>
25.	Crank & Slotted Lever Mechanism	Metallic model mounted on the wooden board.	 <p>A metallic model of a crank and slotted link mechanism mounted on a wooden board. It features a red crank disk and a transparent slotted link. A label at the bottom reads "CRANK & SLOTTED LINK MECHANISM".</p>
26.	Ellipse Tracer Model	Metallic model mounted on the wooden board.	 <p>A metallic model of an ellipse tracer mechanism mounted on a wooden board. It consists of a red horizontal bar and a yellow frame with a black rod. A label on the right side reads "ELLIPSE TRACER MODEL".</p>
27.	Four Bar Link Mechanism	Model is mounted on the base.	 <p>A four-bar link mechanism model mounted on a clear acrylic base. It features a green frame and a yellow connecting rod. A label at the top reads "Four Barlink Mechanism".</p>
28.	Inversion of Four Bar Mechanism	Model is made up of aluminum and other metallic parts. Model is mounted on a wooden board of size 90 x 60 cm. Angular and linear scales are provided to find the displacement of points in links.	 <p>A model of the inversion of a four-bar mechanism mounted on a wooden board. It features a yellow frame and a black connecting rod. A label in the center reads "LOCOMOTIVE COUPLING".</p>

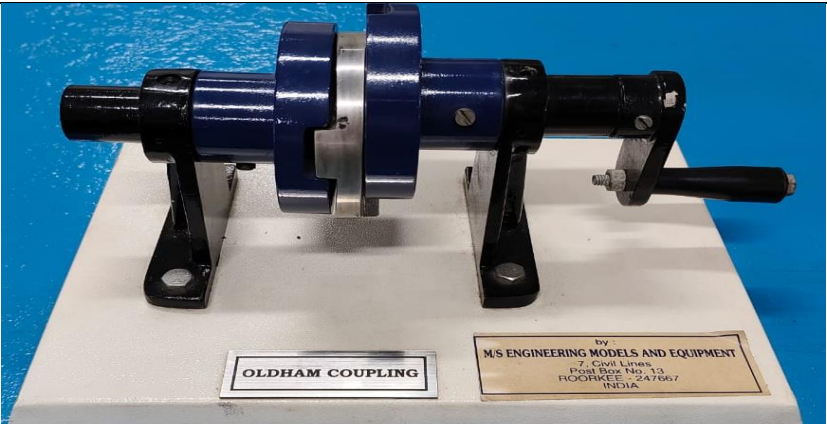





29.	Kinematic Pairs	<p>Model consists of different types of pair viz sliding pairs, turning pair, rolling pair (two types), screw pair (two types), spherical pair, completely constrained motion, gear wheels and two types of links.</p> <p>All pairs mounted on a wooden board.</p>	
30.	Oscillating Cylinder Mechanism	Metallic model mounted on the wooden	
31.	Pantograph Mechanism	Model explains the working of pantograph mechanism.	
32.	Pawl and Ratchet Motion	Model shows intermittent motion of ratchet wheel.	

33.	Peaucellier Mechanism	As per Standard	 A Peaucellier Linkage Drive model, featuring a red linkage mechanism mounted on a white base with a label "Peaucellier Linkage Drive". The mechanism consists of several red links connected by joints, with a purple handle at the bottom.
34.	Reciprocating engine mechanism/ Slide Crank Mechanism	Metallic model mounted on the wooden board.	 A reciprocating engine mechanism model, featuring a blue crankshaft and a red flywheel, mounted on a white base with a label "RECIPROCATING ENGINE MECHANISM".
35.	Scotch Yoke Mechanism	Metallic model mounted on the wooden board.	 A Scotch Yoke Mechanism model, featuring a black yoke and a blue circular scale, mounted on a white base with a label "SCOTCH YOKE MECHANISM". A red strip is visible on the right side of the base.
36.	Two Crank Linkage Drive Model	As per Standard	 A Two Crank Linkage Drive Model, featuring a black and red linkage mechanism mounted on a white base with a label "TWO CRANK LINKAGE DRIVE MODEL". The mechanism is shown in a transparent enclosure.

37.	Watt Mechanism	As per Standard	 <p>A model of Watt's Parallel Motion Linkage. It features two red horizontal bars connected by a central yellow vertical link. The mechanism is mounted on a white base plate with the text "WATT'S MECHANISM" in red. A small label on the base reads: "by: M/S ENGINEERING MODELS AND EQUIPMENT, 7, Civil Lines, Post Box No. 13, ROORKEE - 247667, INDIA".</p>
38.	Whitworth Quick Mechanism	Metallic model mounted on the wooden board.	 <p>A metallic model of a Whitworth Quick Return Mechanism. It consists of a blue crank handle, a connecting link, and a slider block moving along a horizontal guide. The model is mounted on a white wooden board. A label on the board reads: "WHITWORTH QUICK RETURN MECHANISM".</p>
39.	Crank Shaft to Slider Mechanism	As per Standard	 <p>A model of a Single Slider Crank Mechanism. It features a blue crank handle connected to a slider block that moves along a horizontal guide. The model is mounted on a white wooden board. A label on the board reads: "SINGLE SLIDER CRANK MECH.". A small label on the board also reads: "by: M/S ENGINEERING MODELS AND EQUIPMENT, 7, Civil Lines, Post Box No. 13, ROORKEE - 247667, INDIA".</p>
40.	Crank Drive to Oscillating Link Mechanism	As per Standard	 <p>A model of a Crank Drive to Oscillating Link Mechanism. It features a yellow crank handle connected to a red oscillating link. The model is mounted on a white base plate with the text "CRANK DRIVE TO OSCILLATING LINK MECHANISM" in red.</p>
41.	Belt Drive Single Speed	Model consists of two pulleys with a V belt, Model is fitted on a board with crank handle.	 <p>A model of a Belt Drive Single Speed mechanism. It consists of two pulleys of different sizes connected by a black V-belt. The larger pulley has a blue crank handle. The model is mounted on a white base plate.</p>
42.	Belt Drive Two Speed	Model consists of two single pulleys, one double pulley and two V belt. Model is fitted on a board with crank handle.	 <p>A model of a Belt Drive Two Speed mechanism. It consists of two single pulleys, one double pulley, and two V-belts. The model is mounted on a white base plate. A label on the base reads: "FHP 2200".</p>

43.	Belt Drive (Loose and fast pulleys)	Model consists of a driven pulley on one shaft and other shaft has two pulleys, one fixed and other loose one. Model is fitted on a board with crank handle. Model shows starting and stopping of a machine.	
44.	Chain Drive	Model is mounted on a wooden board	
45.	Friction Wheel Drive	Model shows the system of giving variable speeds. Model is mounted on a wooden board.	
46.	Geneva Drive	Model shows intermittent motion.	
47.	Cam and Follower	Five different types, mounted individually on separate boards. Model displays circular and displacement of the cams and followers respectively.	
48.	Keys set of five Box or Muff Coupling	Metallic models mounted on shaft with collars. Metallic model consists of two shafts whose ends are made to butt together by means of a sunk key.	

49.	Cotter Joint	Metallic model	
50.	Flanged Couplings	Model with bolts, key groove and key	
51.	Flexible Coupling	As per Standard	
52.	Hook Coupling, Double Type	Metallic model with pointer and graduated scale in degrees is provided.	
53.	Knuckle Joint	Metallic model	
54.	Nipple Joint	Metallic model mounted on base.	

55.	Oldham's Coupling	Metallic section cut model explains the transmission between two shafts which are not co-axial. The model is mounted on a wooden base.	
56.	Pin Joint Pipe Joint	Metallic model Italic model	
57.	Rivets (Different types)	An all metallic models mounted on a base with nomenclature. 1- Cup head 2-Pan Head 3-Conical head 4-Counter sunk head	
58.	Riveted Joint	A set of four wooden models consists of single and double lap joint, single and double strap joint.	
59.	Splined Shaft	As per Standard	
60.	Union Joint	As per Standard	

61.	Free & Forced Vibration Apparatus & Universal Vibration Apparatus	<p>EXPERIMENTAL CAPABILITIES</p> <ul style="list-style-type: none"> ➤ To Verify the relation $T = 2\pi\sqrt{l/g}$ for a simple pendulum. ➤ To determine the radius of gyration of compound pendulum. ➤ To determine the radius of gyration of given bar by using bifilar suspension. ➤ Experiment on Longitudinal Vibration ➤ To determine natural frequency of spring mass system. ➤ Equivalent mass system. ➤ To determine natural frequency of free torsional vibrations of single rotor system.
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