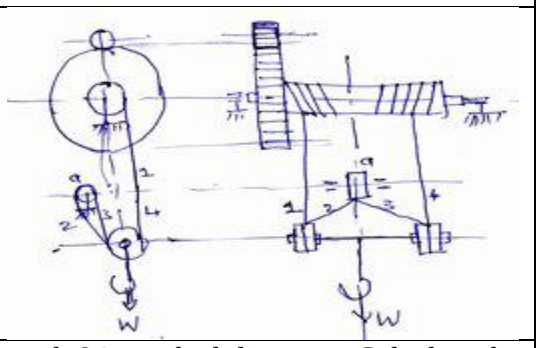
1	Design a 3.5 tonnes MS Forged crane hook of trapezoidal cross section as per standards. Determine the maximum stress induced in the hook when subjected to designed load.
2	A central horizontal section of hook is a symmetrical trapezium 60 mm deep, the inner width is 60 mm, and outer width is 30 mm. Estimate the extreme intensities of stresses when the hook carries a load of 20 KN. The load line passes at 40 mm from the inside edge of the section and the centre of curvature lies in the load line.
3	Determine the maximum compressive and tensile stress in the critical section of a crane hook lifting a load of 50 KN. The line of application of the load is at a distance of 80 mm from the inner fibre. The cross section of hook is a trapezium with 120 mm deep, inner width is 80 mm and outer width is 40 mm.
4	Design a crane hook to lift a load of 40 KN with 50% over load capacity. Allowable tensile stress in crane hook section = 18 MPa, allowable tensile stress in shank = 45 MPa. Determine the maximum stress developed in critical section of hook.
5	Select the ropes, pulleys and drum for an over head travelling crane with a lifting magnet. Lifting capacity = 4500 kg (mass), Weight of lifting magnet = 210 kg (mass), weight of lifting tackle = 110 kg (mass), Lifting height = 8.5 m, No. of rope parts = 4. 
6	A single point hook is made from a 50 mm M.S. bar with 84 mm bed diameter. Calculate the safe load that can be taken by this hook, if the design permissible stress is limited to 160 MPa. If the hook section is changed to trapezoidal section from triangular section for the same bar what will be the change in load carrying capacity?
7	Design a crane hook for lifting capacity of 5 tones. Take permissible tensile stress 80N/mm^2 for forged steel. Assume a triangular section for hook design.
8	Design a single rope drum to transmit a torque of 8 kN.m with a 32 mm rope. Assume the height of the load to be raised as 2.7 meter and the ratio of the pulley system as 2. The mean diameter of the drum is 576 mm. Assume the drum to be made of Grey cast iron, grade 20 having allowable shear strength of 33 MPa. Make a neat sketch of the arrangement.
9	Design a wire rope for a lift using following details: Number of ropes = 02 Maximum load on the ropes including the cabin weight = 8 kN Tensile strength of 6×19 wire rope = 43.5 d2 kN where d = Rope diameter in cm. Factor of safety = 12 and assume necessary data.
10	Find the main dimensions of a cast iron rope drum from the following data for winding rope (two sides): Maximum load to be lifted = 40 kN Diameter of wire rope = 14 mm Lifting height = 10 m iv. Number of falls = 04 Drum diameter is 30 times rope diameter Allowable stress for cast iron = 25 MPa Use two movable sheaves.