CONTINUOUS INTERNAL EVALUATION- 2

Dept:ME	Sem / Div:VI A	Sub:DME II	S Code:18ME62
Date:24/06/2021	Time: 3:00-4:30 pm	Max Marks: 50	Elective:N
Note: Answer any 2 full questions, choosing one full question from each part.			

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QN		Questions	Marks	RBT	COs
		PART A			
1	a	Design a pair of bevel gears to connect two shafts at 60°. The gears are alloy steel of case hardened and precision cut with form cutters. The gear ratio is 5:1. Power transmitted is 30kW at 900 rpm of pinion. The teeth are 20° full depth . The pinion has 24 teeth. Suggest suitable surface hardness for gear pair	25	L4	CO2
		OR			
2	a	A pair of straight bevel gears transmit 15kW at 1250 rpm of 120mm diameter of pinion. Speed reduction is 3.5. Use 14.5° full depth tooth system. Pinion is made of alloy steel of case hardened and gear is cast steel 0.2% C heat treated. Suggest suitable hardness	25	L4	CO2
		PART B			
3	a	A compressor requiring 90kW is to run at 250 rpm. The drive is from an electric motor running at 750 rpm. The diameter of the pulley on the compressor shaft is 1m while the centre distance between the pulleys is limited to 1.75m. The belt speed should not exceed 1600 m/min. Determine the number of V belts required to transmit the power if each belt has a cross section area of 375mm² and density of 1 Mg/m³ and allowable stress of 2.5 N/mm². Groove angle of the pulley is 25˚ and coefficient of friction is 0.25	15	L4	CO1
	b	A 25mm 6X37 steel wire rope is used in a mine of 80m deep. The velocity of the cage is 2m/sec and time required is 10 seconds. The diameter of the drum is 1.25m. Determine the safe load that the hoist can handle by assuming FOS 8.Also calculate safe load by considering impact	10	L4	CO1
		OR			
4	a	Select a V belt to transmit 10kW of power from a pulley of 200mm pitch diameter mounted on an electric motor running at 720 rpm to another pulley mounted on a compressor running at 200 rpm. The service is heavy duty varying from 10 hrs to 14 hrs per day and centre distance between centre of pulleys is 600mm.	15	L4	CO1
	b	Select a wire rope to lift a load of 10kN through a height of 600m from a mine. The weight of bucket is 2.5kN. The load should attain a maximum speed of 50m/min in 2 seconds.	10	L4	CO1

Prepared by: Ajith K HOD