Sanjay Ghodawat University, Kolhapur

2020-21

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

EXM/P/09/00

Year and Program: Final Year Mechanical Engg	**School of Technology**	**Department: Mechanical**
Course Code: MET 401	**Course Title: Design of Power Transmission Elements**	**Semester : VII**
Day : Tuesday **Date : 15.12.2020**	**End Semester Examination**	**Time : 2 Hrs.** **Max Marks : 50**

Instructions: 1) All Questions are compulsory.
2) Assume suitable data if required

			Marks	Bloom's Level	CO
Q.1		**Answer the following (Any Two)**–			
	a)	Explain by procedure How endurance limit is determined by approximate method	8	II	401.1
	b)	Explain with sketches design considerations of machined parts. What is design for manufacturing and assembly	8	II	401.2
	c)	Explain followings for bearings a) dynamic load carrying capacity b) equivalent bearing load c) load-life relationship d) designation of rolling contact bearings with example	8	II	401.3
Q.2		**Answer the following (Any Two)**			
	a)	Explain with neat sketches the working principle of hydrodynamic journal bearings	8	II	401.4
	b)	Derive the Lewis equation for the beam strength of spur gear with assumptions	8	III	401.5
	c)	It is required to design a pair of spur gears with 20^0 full-depth involute teeth consisting of 18 teeth meshing with a 48 teeth gear. The pinion shaft is connected to a 20 kW, 1400 rpm electric motor. The starting torque of a motor is 150% of rated torque. The pinion and gear material is steel having S_{ut} =420 N/mm^2.The factor of safety is 1.5. Design the gears using i) velocity factor for dynamic load ii) Spots equation for dynamic load. Assume C_v=3/3+v	8	III	401.5
Q.3		**Answer the following (Any Two)** –			
	a)	What is virtual number of teeth for helical gear? Derive the relation for it	9	III	401.5

b)	Draw sketch of pair of bevel gears showing its nomenclature. Explain force analysis of bevel gears	9	III	401.6
c)	Write a note on a) Material selection of worm gears & b) Thermal considerations of worm gears	9	II	401.6

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