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: TY B Tech 2021	**School of Technology**	**Department: Mechanical**
Course Code: MET 303	**Course Title: Dynamics of Machines**	**Semester :V**
Day and Date:	**End Semester Examination**	**Time : 2 Hrs.** **Max Marks : 50**

Instructions: 1) All Questions are compulsory.

Q.1	**Answer/Solve the following (any Two)–**	**Marks**	**Bloom's Level**	**CO**
a)	Two mating teeth with module of 5 mm have 20 and 45 teeth of 20^0 pressure angle, and 7 mm addenda. Determine the number of pairs of teeth in contact.	8	L2	CO1
b)	Derive the expression for maximum efficiency for spiral gears	8	L2	CO1
c)	In the Gear Train as shown in Fig 1, pinion A has 15 teeth and is rigidly fixed to the motor shaft. The wheel B has 20 teeth and gears with A and also with annular fixed wheel E. Pinion C has 15 teeth and is integral with B (C-B is compound gear wheel). Gear C meshes with wheel D, which is keyed to machine shaft. The arm rotates about the shaft on which A is fixed and carries the compound wheel B-C. If the motor runs at 1000 rpm, find the speed of machine shaft.	8	L2	CO1

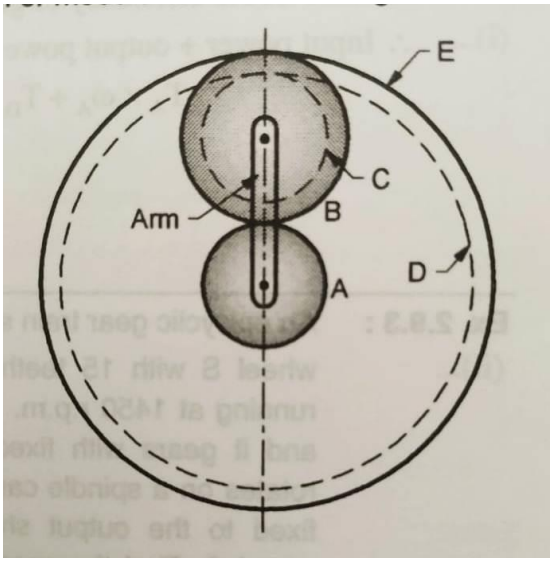


Fig 1

Q.2 Answer/Solve the following (any two) –

a)	Derive the equation of correction couple to be applied to make two mass systems dynamically equivalent.	8	L1	CO3
b)	A connecting rod is suspended from a point 25 mm above the small end centre and 650 mm above its C.G. It takes 50 seconds for 20 oscillations. Find dynamically equivalent system of two masses when one mass is located at small end centre. Mass of the connecting rod is 50 kg.	8	L1	CO3
c)	Explain maximum fluctuation of energy and coefficient of fluctuation of energy.	8	L1	CO2

Q.3 Answer/Solve the following (any two) -

a)	Four masses m_1, m_2, m_3 and m_4 are 250 kg, 350kg, 290kg and 310 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively. The angles between successive masses are 45^0,$75^0$and 135^0.Find the magnitude of the balance mass required, if its radius of rotation is 0.5 m.	9	L3	CO4
b)	The turbine rotor of ship has mass 2000 kg and it rotates at a speed of 3000 rpm clockwise when seen from rear. The radius of gyration of rotor is 500 mm. Determine the gyroscopic couple and its effect if the ship is steering to left in a curve of 100 m radius at a speed of 30 km/hr.	9	L3	CO5
c)	Derive the equation for stability condition of two wheeler vehicle with usual notations	9	L3	CO5

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