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: 2020-21 **TY B Tech**	**School of Technology**	**Department:** Mechanical Engineering
Course Code: MET 303	**Course Title:** Dynamics of Machines	**Semester : V**
Day : Tuesday **Date : 16.02.2021**	**Re-End Semester Examination**	**Time : 2Hrs** **Max Marks : 50**

Instructions: 1) All Questions are compulsory.
2) Assume relevant data and state them clearly.

Q.1	**Answer the following (Any Two)**–	**Marks**	**Bloom's Level**	**CO**
a)	Give the classification of Toothed Gearing and define the following terms. 1. Module 2. Backlash	8	L2	CO 303.1
b)	An epicyclic gear train is arranged as shown in Figure No.1. How many revolutions does the arm, to which the pinions B and C are attached. Assume that gear A makes one revolution clockwise and D is stationary. The number of teeth on A and D are 40 and 90 respectively.	8	L2	CO 303.1
c)	The turning moment diagram has been drawn to a scale 1 mm= 600 Nm vertically and 1 mm= 3^0 horizontally. The integrated areas between output torque curve and mean resistance line ,taken from one end are as follows, +52, -124, +92, -140, +85, -72 and +107 mm^2. Engine is running at a speed of 600 rpm. If total fluctuation of speed is not to exceed ±1.5% of the mean, find the necessary mass of the flywheel if radius of gyration is 0.5 m	8	L2	CO 303.2

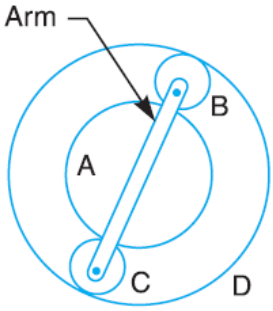


Figure 1

Q.2 Answer the following (Any Two) –

a)	Derive the equation of correction couple to be applied to make two mass systems dynamically equivalent.	8	L1	CO 303.3
b)	Explain partial balancing of unbalanced primary force in a reciprocating engine.	8	L1	CO 303.4
c)	The turbine rotor of a ship has a mass of 8 tonnes and a radius of gyration 0.5 meter. It rotates at 1800 rpm clockwise, when looking from the stern. Determine the gyroscopic couple, if the ship travels at 120 km/hr and steer to the left in a curve of 75 m radius.	8	L1	CO 303.5

Q.3 Answer the following (Any Two) –

a)	The four masses m_1, m_2, m_3 and m_4 having their radii of rotation as 200 mm, 150 mm, 250 mm and 300 mm are 200 kg, 300 kg, 240 kg, and 260 kg in magnitude respectively. The angles between the successive masses are 45^0, 75^0 and 135^0 respectively. Find the position and magnitude of the balance mass required, if its radius of rotation is 200 mm.	9	L3	CO 303.4
b)	Derive the equation for stability condition of four wheeler vehicle with usual notations.	9	L3	CO 303.5
c)	Two mating teeth with module of 6.5 mm have 19 and 47 teeth of 20^0 pressure angle, and 6.5 mm addenda. Determine the number of pairs of teeth in contact.	9	L3	CO 303.1

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