

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Winter Examination – 2022

Course: B. Tech. Branch : Mechanical Engineering Semester : V

Subject Code & Name: BTMC503 Theory of Machines- II

Max Marks: 60 Date:02/02/2023 Duration: 3.00 Hrs.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
Q. 1 Solve any two of the following.		12
A) Explain with Figure types of Flat belt drives.	Understand	4
Compare flat and V-Belt drive.	/CO1	2
B) Derive the formula for Ratio of Driving tensions in Flat belt drive.	Evaluate/ CO1	6
C) The power is transmitted from pulley 1.5m diameter running at 210 RPM to a pulley 2.25 m diameter by means of belt. Find the speed lost by driven pulley as a result of creep, if the stress on tight and slack side of belt is 1.5Mpa and 0.5 Mpa respectively the young's modulus for belt material is 100Mpa.	Evaluate/ CO1	6
Q.2 Solve any two of the following.		12
A) Explain terminology of helical gear with diagram.	Understand / CO2	6
B) A pinion having 35 teeth drives gear having 80 teeth. The profile of gears is involute with 20° pressure angle, 12mm module and 10mm addendum Find the length of path of contact, arc of contact and contact ratio.	Evaluate/ CO2	6
C) State and prove law of gearing.	Evaluate/ CO2	6
Q. 3 Solve any two of the following.		12
A) Explain types of gear trains with neat sketch.	Understand / CO2	6

<p>B) In an Epicyclic gear train an arm carries two gears A and B having 36 to 45 teeth respectively if the arm rotates at 150 rpm in anticlockwise direction about centre of gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed makes 300 rpm in clockwise direction, what will be speed of gear B?</p>	<p>Evaluate/ CO2</p>	<p>6</p>
<p>C) Explain differential gear box and draw table of motion for it.</p>	<p>Understand /CO2</p>	<p>6</p>
<p>Q.4 Solve Any Two of the following.</p>		<p>12</p>
<p>A) Give detailed classification of governors.</p>	<p>Understand /CO3</p>	<p>6</p>
<p>B) Explain coefficient of fluctuation of Energy and speed in case of flywheel.</p>	<p>Understand /CO4</p>	<p>6</p>
<p>C) Explain the effect of Gyroscopic couple on Naval ship during Steering, Pitching and rolling.</p>	<p>Understand /CO5</p>	<p>6</p>
<p>Q. 5 Solve any two of the following.</p>		<p>12</p>
<p>A) Explain the terms longitudinal vibrations, transverse vibrations and torsional vibrations with neat sketch and application of each.</p>	<p>Understand /CO6</p>	<p>6</p>
<p>B) Compare natural (free) vibration with forced vibration. Also provide two examples for each.</p>	<p>Apply/ CO6</p>	<p>6</p>
<p>C) A cantilever shaft 50 mm diameter and 300 mm long has a disc of mass 100 kg at its free end. The Young's modulus for the shaft material is 200 GN/m. Determine the frequency of longitudinal and transverse vibrations of the shaft.</p>	<p>Evaluate/ CO6</p>	<p>6</p>

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