GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-V • EXAMINATION – SUMMER • 2015

Subject Code: 152504Date: 07/05/2015Subject Name: Dynamics of Machine & Production Engineering Drawing
Time: 02.30pm-05.00pmTotal Marks: 70Instructions:Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions (Including Dimensions if not readable) wherever necessary.
- 3. Figures to the right indicate full marks.
- 4. Use Answer-Book for theoretical & drawing sheet for graphical solution in Engg. Drawing answers.(Follow First Angle Projection Method)
- Q.1 (a) Draw and explain pivoted-cradle type balancing machine.
 - (b) The axes of a three-cylinder radial engine are at 120° to one another and their connecting rods are coupled to a single crank. The length of each connecting rod is 240 mm and stroke is 160 mm. The reciprocating parts have a mass of 2.4 kg per cylinder. Determine the primary and secondary forces if the engine runs at 2000 rpm.
- Q.2 (a) Draw and explain turning moment diagram for (i) Single-cylinder Double acting 07 Steam engine & (ii) Single-cylinder Four-stroke Engine.
 - (b) The turning moment diagram for a multicylinder engine has been drawn to a vertical scale of 1 mm = 650 N.m and for horizontal scale of 1 mm = 4.5°. The areas above and below the mean torque line are -28, +380,-260, +310,-300,+242,-380,+265 and -229 mm². The fluctuation of speed is limited to +-1.8% of the mean speed which is 4000 rpm. Density of the rim material is 7000 kg/m³ and width of the rim is 4.6 times its thickness. The centrifugal stress in the rim material is limited to 6 N/mm². Neglecting the effect of boss and arms, determine the diameter and cross-sectional area of the flywheel rim.

OR

- (b) Derive an equation for finding the counter mass and its angle in two planes to 07 balance the static unbalance of rotating masses.
- Q.3 (a) Discuss the effect of damping on vibratory systems. What is meant by under 07 damping, over damping and critical damping?
 - (b) Determine the equivalent spring stiffness and the natural frequency of the vibrating system when (i) The mass is suspended to a spring (ii) the mass is suspended at the bottom of the two springs in series. (iii) The mass is fixed in between two springs. Draw the schematic diagram and take $S_1=5$ N/mm, $S_2=8$ N/mm, m = 10 Kg. For the first case consider S_1 .

OR

Q.3 (a) With the usual notation derive an expression for finding velocity and acceleration 07 of piston.

07

(b) The shaft carries in Fig. 1 carries two masses. The mass A is 300 kg with radius 07 of gyration of 0.75 m and the mass B is 500 kg with the radius of gyration of 0.9m. Determine the frequency of torsional vibrations.



- **Q.4 (a)** Describe the use of foundation bolt. Draw freehand sketch of any TWO 07 foundation bolt.
 - A cylinder 50 mm diameter and 70 mm axis is completely penetrated by another 07 **(b)** of 40 mm diameter and 70 mm axis horizontally. Both axes intersect and bisect each other. Draw projections showing curves of intersections.

OR

- **0.4** With the help of freehand sketch draw a thread profile of (i) Buttress thread (ii) 07 **(a)** Acme thread (iii) Square thread.
 - Draw a missing L.H.S.V. with the given elevation and plan shown in figure 2. 07 **(b)**



- Q.5 **(a)** Draw the following geometrical tolerances symbol (i) Straightness (ii) Flatness 07 (iii) Roundness (iv) Cylidricity (v) Angularity (vi) Parallelism (vii) Runout 07
 - Draw the missing line in the given figure 3. **(b)**



- Q.5 What do you mean by working drawings? What kind of information is provided 07 **(a)** by Assembly drawing and Detail drawing?
 - **(b)** Draw any SEVEN welding symbols.

07