Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – WINTER • 2014

Subject Code: 152504 Date: 01-12-2014

Subject Name: Dynamics of Machine and Production Engineering Drawing

Time: 10.30 am - 01.00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What do you mean by balancing machines? Describe any ONE type of balancing machine. **07**

(b) A single cylinder reciprocating mass of 60Kg.The crank rotates at 60 rpm and the stroke is 320 mm. Mass of the revolving parts at 160 mm radius is 40 Kg. If two-thirds of the reciprocating parts and the whole of the revolving parts are to be balanced, determine **07**

(i) The balance mass required at a radius of 350 mm

(ii) The unbalanced force when the crank has turned 50°from the top-deadcentre

Q.2 **(a)** Derive the expression for velocity and acceleration of piston with usual notations. **07**

(b) Define the terms coefficient of fluctuation of energy and coefficient of fluctuation of speed. Also find a relation for the coefficient of fluctuation of speed in terms of maximum fluctuation of energy and the kinetic energy of the flywheel at mean speed. **07**

OR

(b) The turning-moment diagram for a petrol engine is drawn to a scale of 1 mm = 500 N.m and a horizontal scale of 1 mm = 3°. The turning moment diagram repeats itself after every half revolution of the crankshaft. The areas above and below the mean torque line are 260,-580,80,-380,870 and -250 mm^2.The rotating parts have a mass of 55 Kg and radius of gyration of 2.01m. If the engine speed is 1600 rpm, determine the coefficient of fluctuation of speed. **07**

Q.3 **(a)** Explain the following terms with respect to vibrations (i) Damping co-efficient(ii) Damping Factor (iii) Free Vibration (iv) Degree of Freedom (v) Logarithmic Decrement (vi) Magnification Factor (vii) Transmissibility **07**

(b) A vibrating system consists of a mass of 45 Kg, a spring of stiffness 30 KN/m and a damper. The damping provided is only 20% of the critical value. Determine: (i) the damping factor (ii) the critical damping co-efficient (iii) the natural frequency of damped vibrations (iv) the logarithmic decrement (v) the ratio of two consecutive amplitudes. **07**

OR

Q.3 **(a)** Describe a two rotor vibratory system and find the ratio of their amplitude of rotors. **07**

(b) Four masses P, Q, R and S are completely balanced. Masses R and S make angles of 90° and 195° respectively with that of mass Q in the counter-clockwise direction. The rotating masses have following properties: m_q=25 Kg, m_r= 40 Kg, m_s=35 Kg, r_p=150 mm, r_q= 200 mm, r_s= 180 mm. Planes Q and R are 250 mm apart. Determine **07**

(i) The mass P and its angular position with that of mass Q

(ii) The positions of all the planes relative to plane of mass P.

Q.4 **(a)** **07**

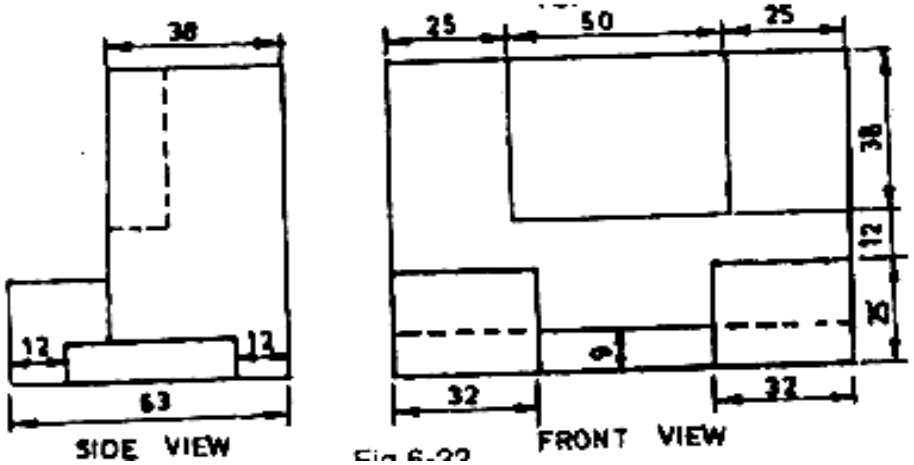

Fig 6-22

Draw the Missing Top View for the above figure in First Angle Projection Method. Consider all dimensions are in mm.

(b) A vertical cylinder of 50 mm diameter and height 75 mm , resting on its base on H.P.,is completely penetrated by another cylinder of 32 mm diameter with 15 mm extensions on both sides of the vertical cylinder such that their axes bisect each other at right angle and 6 mm apart. Draw the projections showing curves of interpretation, assuming the axis of penetrating cylinder to be parallel to both H.P. and V.P. **07**

OR

Q.4 **(a)** What is the use of Foundation bolt? Draw freehand sketch with proportionate dimensions of any THREE foundation bolt. **07**

(b) Draw any THREE types of thread profiles using freehand sketch. **07**

Q.5 **(a)** Explain following geometrical tolerances : (i) Angularity (ii) Run out (iii) Flatness (iv) Circularity **07**

(b) Draw any SEVEN welding symbol with its designation. **07**

OR

Q.5 **(a)** What is a detail drawing? What are an assembly drawing and a set of working drawings? **07**

(b) What is the use of Keys in Coupling? Draw free hand sketch of any THREE type of Keys. **07**

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