Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER – VI • EXAMINATION – WINTER 2012

Subject code: 162505 **Date: 08/01/2013**

Subject Name: Estimating, Costing and Engineering Economics

Time: 02.30 pm - 05.00 pm **Total Marks: 70**

Instructions:

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

Q.1 **(a)** List the functions of Estimating. Also give the qualities of an 'Estimator, **07**

(b) Explain in brief the following allowances . **07**

(i) Personnel allowances

(ii) Fatigue allowance

(iii) Tool changing and grinding allowances

Q.2 **(a)** A factory produces two components A & B. Component A requires 20 hours and is manufactured by the workers paid at the rate of Rs 1 per hour, while component B also requires 20 hours but the workers producing it are paid at the rate of Rs 0.75 per hour. Find the on-cost of each components if (i) it is 40% of the direct labour cost (ii) Rs 0.40 per man hour. **07**

(b) Two workmen engaged on a forging hammer complete 20 connecting rods, each weighing 4 kg. The workmen are paid at the rate of Rs 5 and Rs 3 per day and material cost is Rs 2 per kg. If 40% of direct labour is charged to compensate for both factory overheads and administrative expenses, what will be per unit cost of production of these units? **07**

OR

(b) How would you calculate the cost of a finished product in a factory? **07**

Q.3 **(a)** A machine is purchased for Rs 40000. The estimated life of machine is 15 years and scrap value Rs 15000. If the rate of interest on the depreciation fund is charged at 5%, calculate the rate of depreciation by Sinking fund method. **07**

(b) The estimated life of a lathe is 10 years and it works 16 hours a day. The initial cost of lathe is Rs 8000 and scraps value after 10 years, is Rs 2500. If the machine works for 5840 hours in a year, calculate the rate of depreciation charged annually under machine hour basis method. **07**

OR

Q.3 **(a)** Give the following: **07**

(i) Formula for calculating volume of circular ring.

(ii) Formula for calculating area of a sector

(iii) Simpson's rule

(b) Find out the weight of 10 M.S. spindles, the shape and size **07**

of which are given in fig.1. Also calculate the weight of scrap , if they are turned out from a M.S. rod of 25 mm dia. and facing and parting off allowances can be taken as 1 mm and 5 mm respectively. Assume that 15 mm length of rod is required for grip in the chuck. Density of M. S. is 7.8 gm/cc

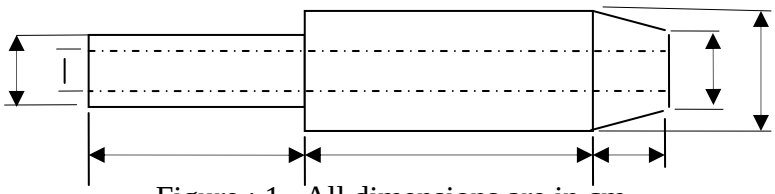

Figure : 1 All dimensions are in cm

Q.4 **(a)** A 15 mm long M.S. bar is to be turned from 4 cm dia.in single cut in such a way that for 5 cm length the dia. is reduced to 3.8 cm and remaining 10 cm length is reduced to 3.4 cm. Estimate the total time required for turning it, assuming cutting speed as 30 m/min, feed as 0.02 cm/rev and time required for setting and mounting of the job in a three jaw chuck to 30 sec. Neglect the tool setting time. **07**

(b) Estimate the time for reaming a 2 cm dia. hole having 3 cm depth to make it 2.05 cm dia. hole. Assume the cutting speed as 10 m/min and feed as 0.03 cm/rev. **07**

OR

Q.4 **(a)** Find out the time for threading on a 3 cm dia. spindle for a length of 10 cm by single point tool. If 3 threads per cm are to be cut and speed of the spindle is 66 r.p.m. Assume suitable approach and overtake for the tool. **07**

Q.4 **(b)** A 20 x 5 cm C.I. surface is to be faced on a milling machine with a cutter having a dia. of 10 cm and 16 teeth. If the cutting speed and feed are 50 mm/min. and 5 cm/ min respectively, determine the milling time, r.p.m. of the cutter and feed per tooth. **07**

Q.5 **(a)** Top of a C.I. table of size 30cm x 80 cm is to be ground by a wheel having 2 cm face width. If the feed is ¼ th of the width of the wheel and table moves 8 m in one minute, find out the time required for grinding in two cuts. **07**

(b) A C. I. rectangular block of 10 cm x 3 cm is required to be shaped to reduce the thickness from 1.5 to 1.3 cm in one cut. Determine the time required for shaping if cutting speed is 20 m/min and feed is 2 mm/stroke and the cutting ratio is 3/5. **07**

OR

Q.5 **(a)** Cylindrical drums of size 1.5m high and 1 m mean dia. are to be fabricated from sheet of 5 mm thickness by grooved seam joint and both the covers should be jointed with single joint. Calculate the material cost, if sheet is available @ Rs 15 per m^2 **07**

(b) What do you mean by ‘cost control’? Explain the various steps involved in the process of cost control. **07**

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