

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – WINTER 2013****Subject Code: 162505****Date: 09-12-2013****Subject Name: Estimating, costing & Engineering Economics****Time: 02:30 pm to 05:00 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)** Give the importance of costing. Distinguish between Estimating and Costing. **07**
- (b)** Explain in brief the following allowances of time. **07**
(i) set- up time (ii) operation time (iii) tear down time
- Q.2 (a)** Explain in brief the following elements of costs **07**
(i) Material (ii) Labour
- (b)** A factory produces two components A and B. Components A requires 20 hours and is manufactured by the workers paid at the rate of Rs 10 per hour, while components B also requires 20 hours but the workers producing it are paid at the rate of Rs 7.50 per hour. Find out the on-cost of each component, if **07**
(i) it is 40% of the direct labour cost (ii) Rs 4 per man hour
- OR**
- (b)** A certain piece of work is produced by a firm in batches of 100. The direct material cost for that 100 pieces work is Rs 160 and the direct labour cost is Rs 200. Factory on-cost is 35% of the total material and labour cost. Over head charges are 20% of the factory cost. Calculate prime cost and factory cost. If the management wants to make a profit of 10% on the gross cost, determine the selling price of each article. **07**
- Q.3 (a)** A small firm is producing 100 pens per day. The direct material cost is found to be Rs 160, direct labour cost Rs 200 and factory overheads chargeable to it Rs 250. If the selling on-cost is 40% of the factory cost, what must be the selling price of each pen to realize a profit of 14.6% of the selling price? **07**
- (b)** A factory is producing 1000 bolts and nuts per hour on a machine. Its material cost is Rs 375, labour cost Rs 245 and the direct expense is Rs 83. The factory on-cost is 150% of the total labour cost and office on-cost is 30% of the total factory cost. If the selling price of each bolt and nut is Rs 1.30, calculate whether the management is going in loss or gain and by what amount. **07**
- OR**
- Q.3 (a)** A lathe is purchased for Rs 8000 and the assumed life is 10 years and scrap value Rs 2000. If the depreciation is charged by Diminishing Balance method, calculate the percentage by which value of the lathe is reducing every year and depreciation fund after 2 years. **07**
- (b)** The cost of a machine is Rs 16000 and its scrap value is Rs 4000. Determine depreciation charges for each year, if the estimated life of machine is 4 year. Use sum of the year's digit method of depreciation. **07**
- Q.4 (a)** Determine the weight of 10 M.S. spindles as shown 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. **07**

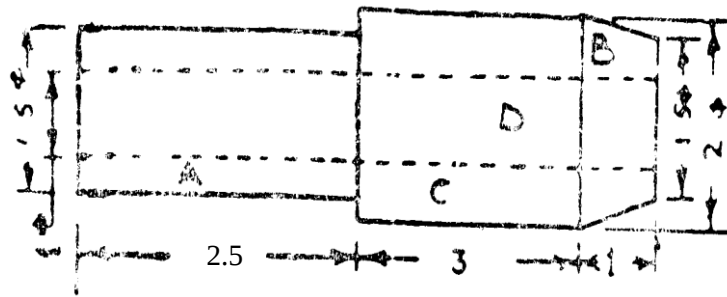


Fig.1 Que. 4(a) All dimensions are in cm.

- (b) Estimate the machining time to turn a M.S. bar of 3 cm diameter down to 2.5 cm for a length of 10 cm in a single cut. Assume cutting speed as 30 m/min and feed as 0.4 mm/rev. 07

OR

- Q.4 (a) Calculate the number of rivets of dimensions shown in Fig.2 which can be manufactured from 4 kg of M.S. Assume that there is no wastage of material. Density of M.S. is 8 gm/cc. 07

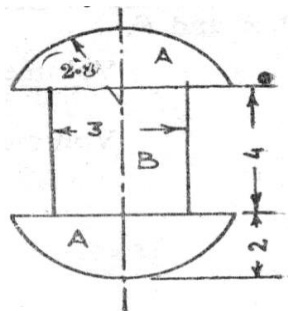


Fig. 2 Que.4 (a) All dimensions in cm.

- (b) A circular Aluminium rod is to be reduced from 5 to 4 cm for a length of 8 cm in two cuts. Assuming cutting speed as 300 m/min and feed as 0.01 cm/rev, estimate the time required for turning 07
- Q.5 (a) A nickel-chrome-steel rod of 5 cm diameter is to be reduced to 3.8 cm diameter for 30 cm length from one of its end. Assume cutting speed as 30 m/min, depth of cut as 2 mm, and feed as 0.03 cm/rev. Calculate the time of machining the job on a centre lathe. 07
- (b) A 20 X 5 cm C.I. surface is to be faced on a milling machine with a cutter having a diameter of 10 cm and 16 teeth. If the cutting speed and feed are 50 m/min and 5 cm/min respectively, determine the milling time, rpm of the cutter and feed per tooth. 07

OR

- Q.5 (a) Top of a C.I. table of size 30 cm X 80 cm is to be ground by a wheel having 2 cm face width. If the feed is $\frac{1}{4}$ 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 rectangular container open on one side of size 0.5 x 0.5 x 1 m height is to be made from plate of 6 mm thickness. Take density of plate metal 8 gm/cc and joints are to be welded. Estimate the cost of container from the following data: 07
- Cost of plate = Rs 1 per kg
 Sheet metal scrap = 5% of the material
 Cost of labour = 10% of the material cost
 Cost of welding material = Rs 2 per metre weld
