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B.E. / B.Tech. DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2011

MANUFACTURING ENGINEERING BRANCH

VI SEMESTER

MF 9026 PROCESS PLANNING AND COST ESTIMATION

(REGULATIONS 2008)

Time: 3 Hours

Maximum: 100 Marks

Answer ALL questions

PART A - (10 X 2 = 20 marks)

1. What do you mean by the term, 'Standardization'?
2. Name the types of production activity for the following:
Aircraft machine tools cars boilers
3. How costing is different from estimation?
4. What shall be the effects of underestimating in an enterprise?
5. Differentiate between fixed and variable costs.
6. State any four causes for depreciation.
7. How welding cost is estimated?
8. List out various pattern allowances.
9. What do you understand by the terms, 'Approach length' and 'over travel'?
10. Top of a C.I. table of size 300 mm X 800 mm is to be ground by a wheel having 20mm 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.

PART B – (5X16=80 Marks)

11. i. Enumerate various steps in estimation. (10)
 - ii. Describe briefly any six aims and objectives of costing (6)
 12. a i) Explain various steps in manual process planning. (8)
 - ii) Describe Retrieval computer aided process planning. (8)
- (Or)
- 12 b i) From the following data for a sewing machine manufacturer prepare a statement showing prime cost, factory cost, production cost, total cost and profit. (10)

Value of stock of material as on 01-04-2010	Rs.2,00,000/-
Material purchased	Rs.9,00,000/-
Wages to labor	Rs.6,00,000/-
Depreciation of plant and machinery	Rs.30,000/-
Depreciation of office equipment	Rs. 12,000/-
Rent, taxes and insurance of factory	Rs.50,000/-
General administrative expenses	Rs.12,000/-
Material transportation in factory	Rs.10,000/-
Insurance and rent of office building	Rs.9,000/-
Direct Expenses	Rs.19,000/-
Commission and pay of Sales man	Rs.40,000/-
Repair and maintenance of plant	Rs.20,000/-
Works manager salary	Rs.6,50,000/-
Salary of office staff	Rs.7,50,000/-
Value of stock material as on 31-03-2011	Rs.1,90,000/-
Sale of products	Rs 45,00,000/-

- ii) From the following data, calculate break even point expressed in terms of units and also the new break even point, if selling price is reduced by 10%. (6)

Fixed expenses

Depreciation : Rs 1,00,000
Salaries : Rs 1,00,000

Variable expenses

Materials : Rs 6 per unit
Labour : Rs 4 per unit
Selling price : Rs 20 per unit

- 13a i) A factory is producing 1000 bolts and nuts per hour on a machine. Its material cost is Rs 750, labour cost is Rs 490 and the direct expenses is Rs 160. 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 Rs2.60, calculate whether the management is going in loss or gain and by what amount? (8)

- ii) The market price of a lathe is Rs 3,00,000 and the discount allowed to the distributor is 20% of the market price. It is found that the selling expense cost is $\frac{1}{4}$ th the factory cost and if the material cost, labour cost and factory overhead charges are in the ratio of 1 : 4 : 2 ; what profit

is made by the factory on each lathe, if the material cost is Rs 24,000? Neglect other overheads. (8)

(Or)

13 b i) A boiler was purchased in Rs 4,50,000 on 1st January 1981, the erection and installation cost was Rs 50,000. The boiler was to be replaced by a new one on 31st December 2000. If the scrap value was estimated as Rs 75,000 what should be the rate of depreciation and depreciation fund on 15th June 1996 using straight line method of depreciation.

After 12 years of running, some boiler tubes were replaced and the replacement cost is Rs 15,000, what will be the new rate of depreciation? (8)

ii) The factory overhead costs of four production departments of a company engaged in executing job orders for an accounting year are:

Department A	Rs 1,93,000
Department B	Rs 42,000
Department C	Rs 40,000
Department D	Rs 20,000

Overhead has been charged as under:

Department A	: Rs 15 per machine hour for 14,000 hours
Department B	: Rs 13 per direct labour hour for 3000 hours
Department C	: 80% of direct labour cost or Rs 60,000
Department D	: Rs 20 per piece for 950 pieces

Find out the amount of department-wise under or over-absorbed overheads. (8)

14a) Calculate the cost of welding two pieces of mild steel sheets 1 meter long and 7 mm thick. A 60^oV is prepared by means of gas cutting before welding is to be commenced. The cost of oxygen is Rs 7/ cu. meter and of acetylene is Rs.40 / cu. meter. The filler metal costs Rs.30/ kg. The following data are available: (8)

For cutting

- Cutting speed is = 20m/hr.
- Consumption of oxygen = 2 cum / hr.
- Consumption of acetylene= 0.2 cum / hr.

Data for right ward welding

- Consumption of oxygen = 0.8 cum / hr.
- Consumption of acetylene= 0.8 cum / hr.
- Diameter of filler rod used = 3.5 mm.
- Filler used per meter of weld = 3.4 m.

Welding speed = 3 meters/hr.

Density of filler metal = 8 gm /cc.

(Or)

14 b i) Calculate the net weight and gross weight for the component shown in Fig Q 14 bi).

Density of material used is 7.87 gm/cm³.

Also calculate length of 15 mm diameter bar required to forge the component.

Cost of forging / piece, its material cost is Rs 30 / kg, labour cost is Rs 7 /piece and

overheads are 130% of labour cost (8)

ii) Find the cost of 2000 C.I. pulleys shown in Fig Q 14 b ii). Its surfaces are to be machined after casting. The pattern is supplied by the customer itself. Following data can be used: (8)

Cost of the metal	: Rs 20 per kg
Moulds prepared by each worker / day	: 20
Melting charges	: 20% of metal cost
Machining allowance on each side may be taken as 2 mm.	
Wages of each moulder	: Rs 150 per day
Density of C.I.	: 7.2 gm/cc
Overhead charges	: 20% of metal cost

15 a) Estimate the items taken to prepare a job as shown in Fig. 15.a) from mild steel stock bar 4.00 cm in diameter and 7.5 cm long. Assumes the following data:

Cutting speed for turning and boring operation - 20m/minute

Cutting speed for drilling operation - 30m/minute

Feed for turning and boring operation - 0.2mm/min

Feed for 20mm drill - 0.23mm/min

Depth of cut not to exceed 3mm in any operation

(Or)

15 bi) A 20 x 5 cm C.I. surface is to be faced on milling machine with a cutter having a diameter of 10 cm and 16 teeth. If the cutting speed and feed rate are 50 m/min and 5 cm/min respectively, determine the milling time, r.p.m of the cutter and feed per tooth. (8)

ii) A C.I. rectangular block of 10 cm X3 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/in and feed is 0.2 mm/stroke and the cutting time ratio is 3/5. (8)

All Dimensions are in mm.

Fig Q 15 a)

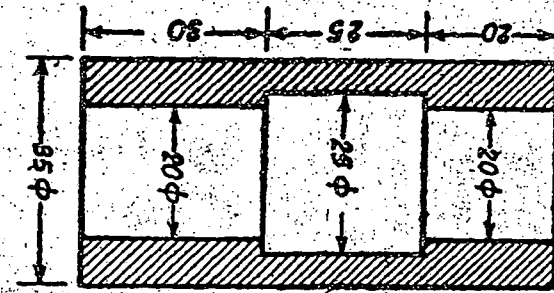


Fig Q 14 b ii)

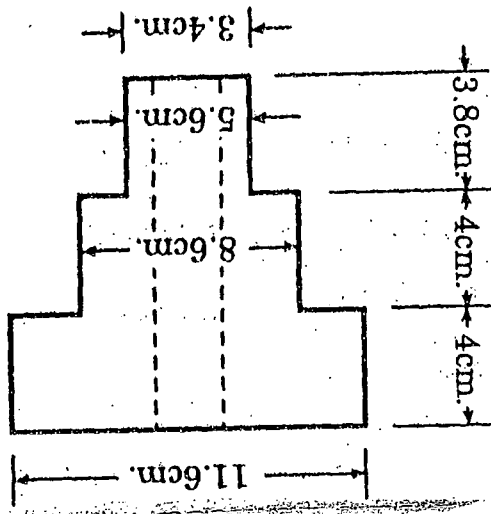


Fig Q 14 b i) All Dimensions are in mm.

