KUMARAGURU
college of technology
character is life

Register Number: ……..

**B.E DEGREE EXAMINATIONS: NOV/DEC 2014**

(Regulation 2009)

Seventh Semester

**MECHANICAL ENGINEERING**

MEC132**:** Process Planning and Cost Estimation

**Time: Three Hours** **Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. _____ is used for deciding manufacturing and scheduling dates.

   a) Bill of Materials b) Inventories

   c) Operations management d) Costing

2. Assigning tasks or jobs to sequential workstations in an assembly line based on the precedence relationships among tasks is

   a) Man power Planning b) Line Balancing

   c) Production planning d) Process Planning

3. The scientific study of the relationship between man and his working environment is known as

   a) Industrial Psychology b) Ergonomics

   c) Industrial Engineering d) Industrial Management

4. The space within which a seated worker can reach and use tools is termed as

   a) Maximum working area b) Minimum working area

   c) Normal working area d) Float working area

5. The variable cost of manufacturing a product (V) varies with equation 4Q where Q is no of products. The fixed cost (F) of the same product reduces with Q according to the equation F=100/Q. How many units are to be produced to minimize the total cost (V+F)

   a) 4 b) 5

   c) 6 d) 7

6. Market price is the sum of selling price and

   a) Profit b) Discount

   c) Expenses d) Total Cost

7. The process of recording the expenses incurred in producing a product and computing the cost of the produced article is known as _____

a) Budgeting b) Estimating

c) Costing d) Allocating

8. Which of the following wages are not included in Indirect labor cost?

a) Store keeper b) Supervisors

c) Inspectors d) Welders

9. The overheads are generally expressed as percentage of

a) Labour charges b) Total cost

c) Prime cost d) Selling price

10. Sum of Direct material cost + Direct labor cost + Direct expenses is

a) Prime cost b) Total cost

c) Production cost d) Overheads

**PART B (10 x 2 = 20 Marks)**

11. Outline the factors affecting process planning.
12. Define manpower planning.
13. Classify the types of controls.
14. Enumerate the objectives of Human factors engineering.
15. Define cost centre.
16. List the various elements of cost.
17. What are all data sources for cost estimation?
18. Differentiate between personal and fatigue allowances.
19. Classify the overheads.
20. List the losses to be considered in estimating the gross weight of the forging component.

**PART C (5 x 14 = 70 Marks)**

21. a) (i) Explain the components retrieval type CAPP system with block diagram. (8)

(ii) Compare manual and computer aided process planning. (6)

**(OR)**

b) Explain the Process and Equipment Selection Procedure in detail.

22. a) With the help of neat sketches describe the Man Machine system and its characteristics.

**(OR)**

b) (i) Explain the importance of working condition. (7)

(ii) State and explain the multi disciplinary nature of ergonomics. (7)

23. a) Apply the break even analysis procedure and select the machine for the following. A component can be produced on either a capstan lathe or an automatic lathe. The different cost factors for the two machines are given below.

| **Machine I** | **Machine II** |
|---|---|
| Fixed cost = Rs.500 | Fixed cost = Rs.1500 |
| Variable cost = Rs.3 /piece | Variable cost = Rs.1/ piece |

Assume that cycle time for production of the component is same for both the machines. Which machine will you select for producing

(a) 800, (b) 700 components.

**(OR)**

b) (i) List and explain the different types of cost components and explain with suitable examples. (10)

(ii) Differentiate between estimation and costing. (4)

24. a) (i) Describe in detail the methods of cost estimates. (7)

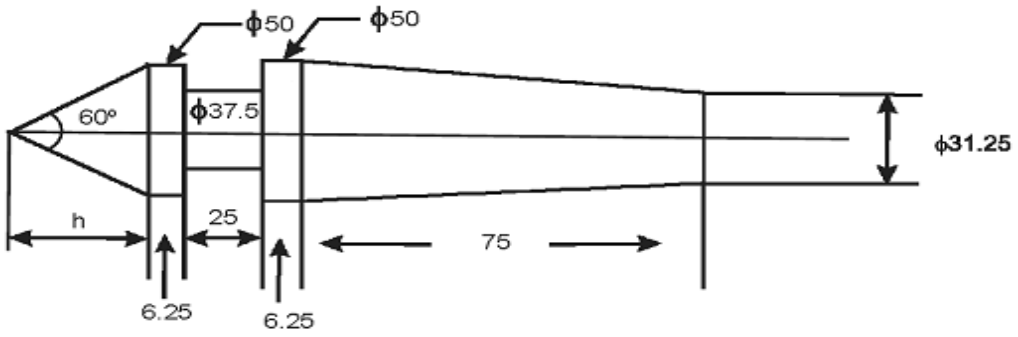
(ii) A small firm is producing 100 pens per day. The direct material cost is found to be Rs. 160, direct labour cost is Rs.200 and factory overheads chargeable to it are Rs.250. If the selling on-cost is 40% of factory cost, what must be the selling price of each pen to realize a profit of 14.6% of the selling price? (7)

**(OR)**

b) (i) Make use of neat block diagram explain the Ladder of cost. (7)

(ii) The catalogue price of a certain machine is Rs. 1,050, the discount allowed to the distributors being 20%. Data collected at a certain period show that the selling cost and factory cost are equal and that the relations among materials costs, labour cost and on cost in the factory are 1: 3: 2. If the labour cost is Rs. 200, what profit is being made on the machine? (7)

25. a) The following figure (Fig. 1) shows a “lathe tail stock”. Estimate the weight and cost of material if C.I. weighs 7.787 gm/cm$^3$ and material cost is 11.45 /kg.




All dimensions are in mm

Fig. 1

**(OR)**

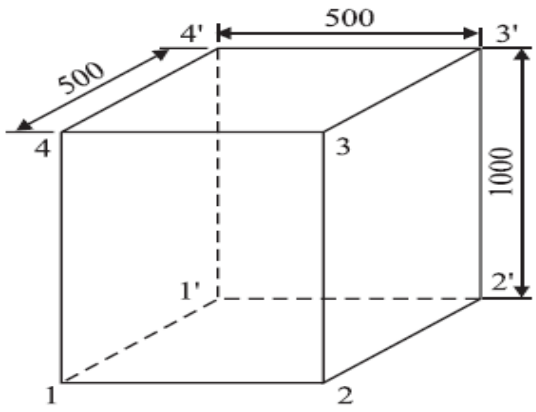
b) A container open on one side of size 0.5 m × 0.5 m × 1 m is to be fabricated from 6 mm thick plates as shown in Fig. 2. The plate metal weighs 8gm/cc. If the joints are to be welded, make calculations for the cost of container. The relevant data is :

Cost of plate = Rs. 10/kg

Sheet metal scarp (wastage) = 5 percent of material

Cost of labour = 10 percent of sheet metal cost

Cost of welding material = Rs. 20/meter of weld. Calculate the selling price of the container.




All dimensions are in mm

Fig.2

**********