A   **Reg. No. :** ☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 99712

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Elective

Mechanical Engineering

19UME912– PROCESS PLANNING AND COST ESTIMATION

(Regulations 2019)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Work study involves   CO1- U

   (a) Only Method study   (b) Only work measurement

   (c) Only Motion study   (d) Method study and work measurement

2. In time study, the rating factor is applied to determine   CO1- U

   (a) standard time of a job   (b) merit rating of the worker

   (c) fixation of incentive rate   (d) normal time of a worker

3. Operation sheets also called   CO2- U

   (a) Instruction sheet   (b) Material requisition sheet   (c) Gantt chart   (d) Check sheet

4. The _____is a listing of the sequence of operations which must be performed on   CO2- U
   the work part.

   (a) Route Sheet   (b) White Sheet   (c) Gantt chart   (d) Material sheet

5. Direct expenses include   CO4- U

   (a) factory expenses   (b) selling expenses

   (c) administrative expenses   (d) none of the above

6. Cost of sales plus profit is _____.   CO4- U

   (a) selling price   (b) value of finished product

   (c) value of goods produced   (d) value of stocks

7. Standard time is   CO5- U

    (a) observed time x rating factor   (b) observed time - rating factor

    (c) Normal time + allowances   (d) Normal time x allowances

8. The following is cost of direct materials   CO4- U

    (a) MS for spindle   (b) grease   (c) coolant   (d) cotton waste

9. The speed at which the cutting tool penetrate the work piece   CO6- U

    (a) Cutting speed   (b) Feed rate   (c) Depth of cut   (d) All of the above

10 Which of the following motion does a milling machine has?   CO5- U

    (a) vertical motion   (b) crosswise motion

   (c) longitudinal motion   (d) All of the above

PART – B (5 x 2= 10 Marks)

11 List the objectives of method study   CO1- U

12 List the factors consider for process planning   CO2- U

13 State the objectives of cost estimating   CO4- U

14 Differentiate hot forging and cold forging.   CO4- U

15 Estimate the machine time to turn a M.S. bar of 30 mm diameter down to   CO6- U
    25 mm for a length of 100 mm in a single cut. Assume cutting speed as 30
    m/min and feed as 0.4 mm/rev

PART – C (5 x 16= 80 Marks)

16 (a) List down the various steps in conducting a stop watch time study CO1-U   (16)
        and explain in detail

            Or

    (b) Explain in brief the steps involved in conducting the method study CO1-U   (16)
        procedure

17 (a) A component can be made either on an ordinary lathe or on an CO3-App   (16)
        automatic lathe. The time taken in first case is 1.5 hours per piece
        and overheads are 30 percent of labour cost. In the second case, the
        time taken is 30 minutes per item and overheads are 200 per cent of
        labour cost. If the material cost is Rs. 20 per piece and labour
        charges are Rs. 5 per hour, compare the total cost in both the cases.

            Or

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(b) The initial cost for machine A is Rs.12000 and the unit production cost of the machine is Rs.6.00 each. For the other machine B, the initial cost is Rs. 48000 and the unit production cost is Rs.1.20 each. Do the break even analysis   CO3-App   (16)

18 (a) Explain the objective of cost estimation and cost accounting.   CO5-U   (16)

Or

(b) Explain in detail the classification and elements of cost.   CO5-U   (16)

19 (a) In a manual operation, observed time for a cycle of operation is 0.5 minute and the rating factor as observed by the time study engineer is 125%. All allowances put together is 15% of N.T. (Normal Time). Estimate the Standard Time.   CO6-App   (16)

Or

(b) In a manufacturing process, the observed time for 1 cycle of operation is 0.75 min. The rating factor is 110%. The following are the various allowances as % of normal time : Personal allowance = 3% Relaxation allowance = 10% Delay allowance = 2% Estimate the standard time   CO6-App   (16)

20 (a) A M.S shaft is to be turned out of a 15 mm φ and 75 mm long ms bar as shown in the following figure. The following operations are to be done on the shaft:
(i) Facing 15 mm φ (both ends). (ii) Turning to 12.5 mm φ.
(iii) Turning to 10 mm φ, a portion of the length 9.25 mm.
(iv) Chamfering on the 10 mm φ end 3 mm × 45°   CO6-App   (16)
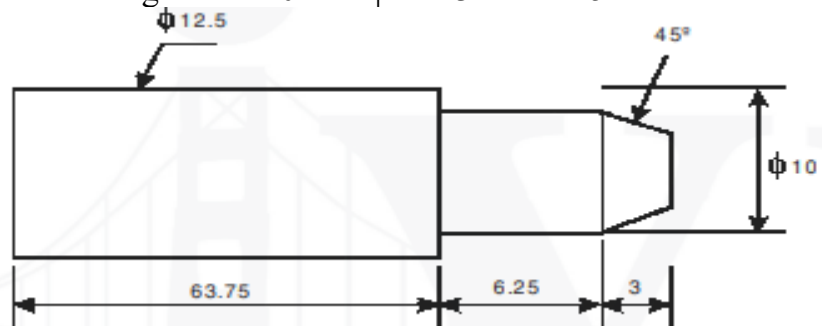
All dimensions are in mm

Take, 'f' for facing 0.125 mm/rev; 'f' for turning 0.35 mm/rev 'f' for chamfering 0.25 mm/rev Depth of cut = 1.25 mm

Or

(b) Determine the machining time to turn the dimensions given in CO6-App (16) figure. The material is brass, the cutting speed with H.S.S tool being 80 m/min and the feed is 0.8 mm.rev

All dimensions are in mm