A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 99712

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

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 the work part. CO2- U

   (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 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 CO6- U

PART – C (5 x 16= 80 Marks)

16 (a) Explain two-handed process chart with an example. CO1-U (16)

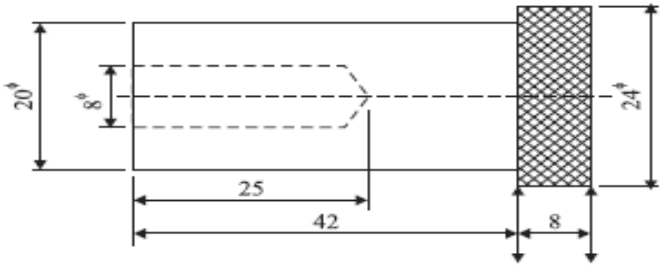
Or

(b) Explain the operation process chart with an example CO1-U (16)

17 (a) A component can be made either on an ordinary lathe or on an 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. CO3-App (16)

Or

	(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 various types of estimation.	CO5-U	(16)
		Or		
	(b)	Explain the procedure involved in cost estimation	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 mild steel shaft, shown in Figure is to be turned from a 24 mm diameter bar.	CO6-App	(16)



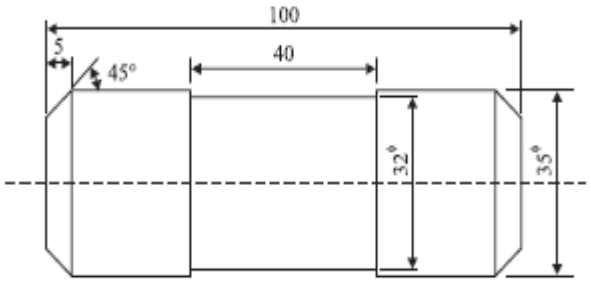
All dimensions are in mm

The complete machining consists of the following steps :
(i) Facing 24 mm on both sides (ii) Turning to 20 mm.
(iii) Drilling 8 mm hole (iv) Knurling.
With H.S.S tool the cutting speed is 60 m/min. The feed for longitudinal machining is 0.3 mm/rev. The feed for facing, 0.2 mm/rev., feed for knurling 0.3 mm/rev., and feed for drilling is 0.08 mm/rev. Depth of cut should not exceed 2.5 mm in any operation. Find the machining time to finish the job.

Or

(b) A mild steel bar 100 mm long and 38 mm in diameter is turned to 35 mm dia. and was again turned to a diameter of 32 mm over a length of 40 mm as shown in the following Figure. The bar was machined at both the ends to give a chamfer of 45° × 5 mm after facing. Calculate the machining time. CO6-App (16)

Assume cutting speed of 60 m/min and feed 0.4 mm/rev. The depth of cut is not to exceed 3 mm in any operation.



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