Reg. No.												

Question Paper Code	12199

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

Seventh Semester

Mechanical Engineering

ME8793 - PROCESS PLANNING AND COST ESTIMATION

(Regulations 2017)

Duration: 3 Hours Max. Marks: 100

PART-A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Define Process Planning.	*2,K1,CO1*
2.	List the main types of Drawing Interpretation.	*2,K1,CO1*
3.	What are uses of control chart?	*2,K1,CO2*
4.	Summarize the seven statistical tools of quality.	*2,K1,CO2*
5.	Define standard time.	*2,K1,CO3*
6.	Define direct material cost.	*2,K1,CO3*
7.	Differentiate leftward and rightward welding.	*2,K2,CO4*
8.	Define upset forging.	*2,K1,CO4*
9.	Define cutting speed. List the various factors affecting the cutting speed.	*2,K2,CO5*
10.	Differentiate plain milling cutter and face milling cutter.	*2,K2,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain in detail process planning activities.	*13,K3,CO1*
		OR	
	b)	Enlist the common approaches in CAPP system and state their advantages and limitations.	*13,K3,CO1*
12.	a)	What is Inspection? Write briefly about the different methods of inspections followed in industries.	*13,K3,CO2*
		OR	
	b)	Discuss about the principles of jigs and fixtures design.	*13,K3,CO2*
13.	a)	Explain elements of cost estimation.	*13,K3,CO3*
		OR	
	b)	Calculate the material cost for the machine part shown in figure-1. Assume the density of gunmetal as 8.2 gm per cc and its cost is Rs 30 per kg. Consider 20% material loss during process and 6 holes for bolt. All dimensions are in mm.	*13,K3,CO3*

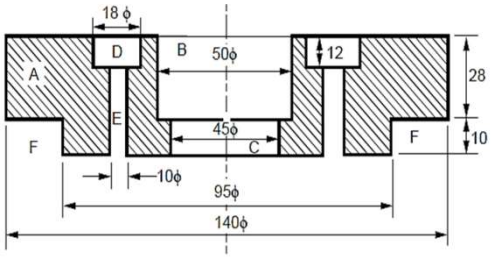

Figure - 1.

14. a) 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 Fig-2. The plate metal weighs 8 gms/cc. If the joints are to be welded, make calculations for the cost of container. The relevant data is: Cost of plate = Rs. 10 per kg ; Sheet metal scarp (wastage) = 5 percent of material; Cost of labour = 10 percent of sheet metal cost; Cost of welding material = Rs. 20 per meter of weld. All Dimensions are in mm. *13,K3,CO4*

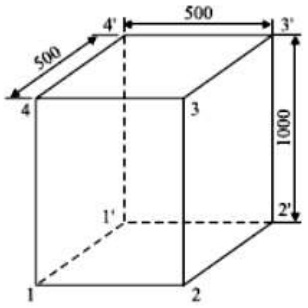

Figure - 2.

OR

b) Estimate the assuming for the following 150 pieces of stepped shaft are to be drop forged from raw stock of 20mm diameter. (i) Shaft size: Step on left: 10 mm diameter x75mm long. Step in the middle; 20 mm diameter x 125mm long. Step on right: 10 mm diameter x75 mm long. (ii) Material cost: Rs.200 per metre (iii) Cost of forging: Rs.1200 per sq. metre of forged surface (iv) Overhead: 100% of forging cost. Consider scale loss, shear loss, flash loss, tong hold loss and sprue loss while making required assumptions. *13,K3,CO4*

15. a) Estimate the machining time required to produce one piece of the component shown in Fig-3. Starting from f 25 mm bar. The following data is available. *13,K3,CO5*

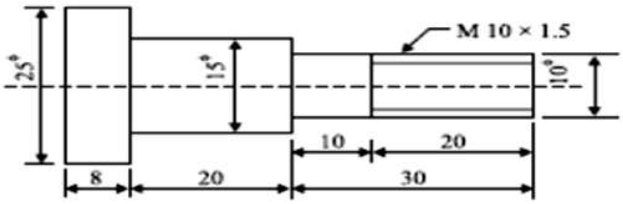

Figure - 3.

For turning: Cutting speed = 40 m/min. Feed = 0.4 mm/rev. Depth of cut = 2.5 mm/per pass for thread cutting: Cutting speed = 8 m/min.

OR

b) The mild steel shaft shown in the Fig-4. is to be machined on a lathe from 25mm diameter bar. Calculate the machining time if speed V is 60 m/min., turning feed is 0.2 mm/rev, drilling feed is 0.08 mm/rev and knurling feed is 0.3 mm/rev. *13,K3,CO5*

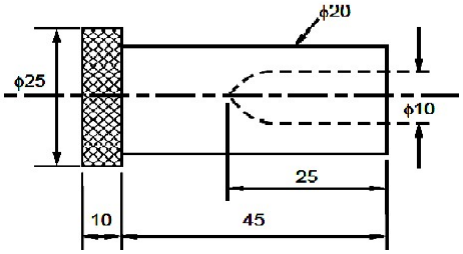

Figure - 4.

PART - C (1 × 15 = 15 Marks)

16. a) Find the time required on a shaper to machine a plate 1100 x 500 mm, if the cutting speed is 16 m/min. The ratio of return stroke time to cutting time is 2: 3. The clearance at each end is 20 mm along the length and 15 mm on width. Two cuts are required, one roughing cut with cross feed of 2 mm per stroke and one finishing cut with feed of 1.25 mm per stroke. *15,K3,CO6*

OR

b) Solve the time required to shape a block 400mm x 250mm on a shaper working with a cutting speed of 12m/min and cross feed of 0.85 mm/stroke. Ratio of return stroke to cutting stroke speed is 3:2.Take allowances as 25mm pm each side pm length and 5mm on each side on width. Solve T-slot is to be cut in a C.I. slab as shown in Fig-5. Analyze the machining time. Take cutting speed 25 m/min, feed is 0.25 mm/rev. Dia of cutter for channel milling is 80 mm. *15,K3,CO6*

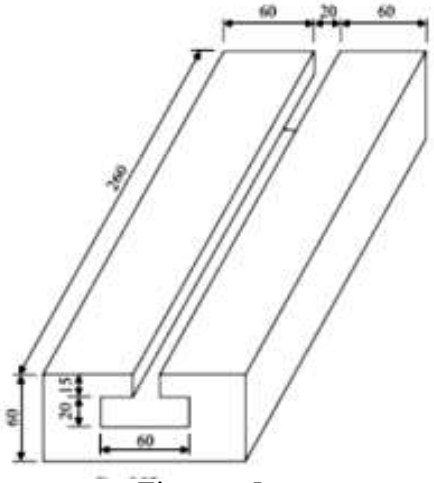

Figure - 5.