

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Fifth Semester

Mechanical Engineering

CME396 - Process Planning and Cost Estimation

Regulations - 2021

Duration : 3 Hrs

Maximum Marks : 100

PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Summarize the information required to do process planning.	2	1	2
2.	List out the stages of machine selection process.	1	1	2
3.	Explain break-even point.	2	2	2
4.	Define quality assurance.	1	2	2
5.	Explain conceptual cost estimating.	2	3	2
6.	List out the components of a job estimation.	1	3	2
7.	Illustrate the formula for flash loss.	2	4	2
8.	Define Inadequacy.	1	4	2
9.	Relate the chamfering and chamfering operations.	2	5	2
10.	Compare the drilling, boring and reaming.	2	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

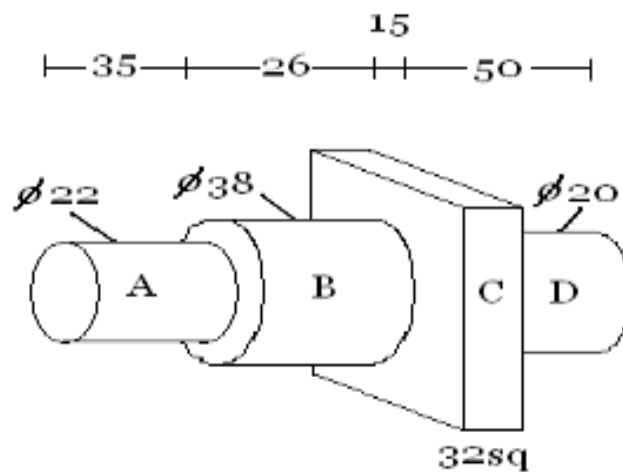
<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Define CAPP? Explain in detail about the types CAPP and mention the benefits of CAPP.	2	1	13
	Or			
	b Explain the main functions of Product design and manufacture and its interface in detail.	2	1	13
12.	a i Explain the Break Even analysis in detail with derivation.	2	2	4
	ii A 25 cm× 10 cm C.I surface is to be faced on a milling machine with a cutter of diameter of 15 cm and 16 teeth. If the cutting speed and feed are 55 m/min and 6 cm/min. respectively, identify the rpm of the cutter, feed/tooth and the milling time.	3	2	9

Or

- b A component can be produced with equal ease on either a capstan lathe or on a single spindle cam operated automatic lathe. Analyze the break even quantity QE if the following information in capstan lathe. 4 2 13

1 Tooling cost	Rs. 40.00	Rs. 40.00
2 Cost of cams	-----	Rs. 150.00
3 Material cost/components	Rs. 0.32	Rs. 0.32
4 Operating labour cost	Rs. 2.50 /hour	Rs. 1.36 /hours
5 Cycle time/component	6 minutes	2 minutes
7 Setting up labour cost	Rs. 4.00/hours	Rs. 4.00/hours
8 Setting up time	1.5 hours	8 hours
9 Machine overheads	300 % of (d)	950 % of (d)

13. a An isometric view of the work piece is shown in figure. What will be the weight of the material required to produce it. The density of material is 2.681gm/cm³. Analyze also the material cost, if its rate is 13.60 per kg. 4 3 13

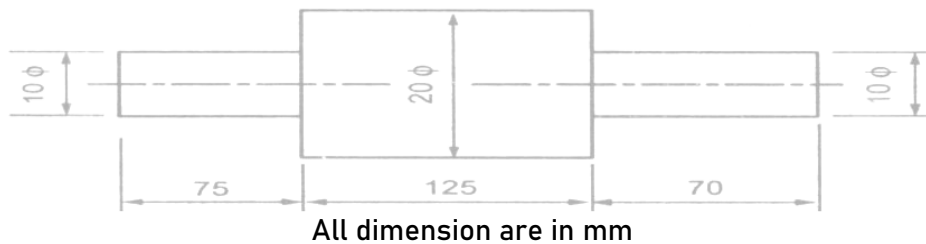


All dimensions in mm

Or

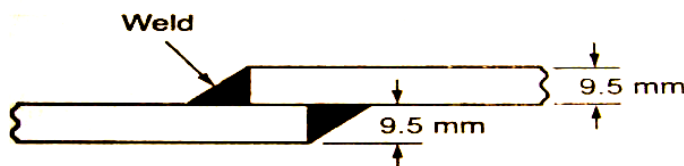
- b Identify the three methods used in conceptual cost estimation? Explain any two methods briefly. 3 3 13

14. a A 150 pieces of shafts as shown in figure are to be forged from the raw stock. Analyze the cost incurred assuming that material cost =Rs5.20 per metre. Cost of forging = Rs120.50 per sq.m of surface area to be forged. Overhead expenses to be 100% of the cost of forging. Consider all losses. 4 4 13



Or

- b A lap joint is to be prepared in 9.5 mm M.S. sheet using flat welding position and 6 mm electrode .Current used is 250 A and voltage is 30 V. Welding speed is 12 m/Hr and 0.3 Kg of metal is deposited per metre length of joint. Labour cost Rs 1.5 per hour, Power Rs.0.20 per KWhr and Electrode Rs.4 per Kg. Efficiency of machine is 50% and operating factor is 60 %. Calculate the cost of labour, power and electrode per metre of weld. 4 4 13



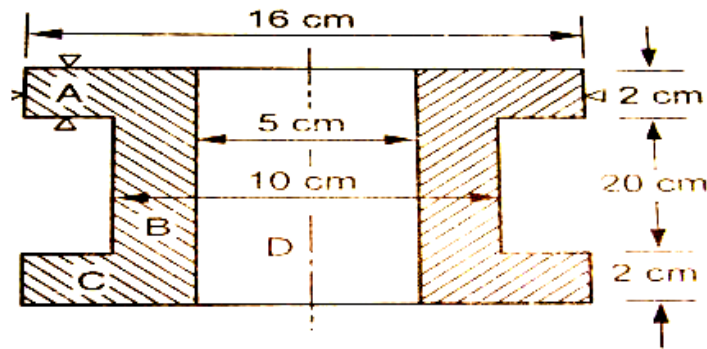
15. a i A 25 cm x 10 cm C.I surface to be faced on a milling machine with a cutter of diameter of 15 cm and 16 teeth. If the cutting speed and feed are 55 m/min and 6 cm/min respectively, Discover the rpm of the cutter, feed/tooth and the milling time. 4 5 7
- ii Analyze the time required for finish grinding a 20 cm long steel shaft to reduce its diameter from 4.5 cm to 4.3 cm with a grinding wheel of 2.5 cm face width. Cutting speed is 16 m/min and depth of cut is 0.2 mm. 4 5 6

Or

- b Analyze the time for producing the threads in drilling and tapping for mild steel of 25 mm thickness. The size of H.S.S drill to be used is 20 mm and the number of threads to be cut is 3 per cm. Taking cutting speed and feed for drill as 20 m/min and 0.25 mm/rev respectively, tapping speed as 5m/min. Neglect the time taken for setting up and approaching and over travelling of tools. 4 5 13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	Estimate the total cost of 20 CI flanged pipe casting shown in figure, assuming the following data, cost of CI = Rs.5/kg, cost of process scrap = Rs.2/kg, process scrap 2% of net weight of casting, moulding and pouring charges = Rs.2/piece, casting removal and cleaning = Rs.0.5/piece, administrative overheads = 5% factory cost, selling overheads = 70% administrative overheads.	5	4	15



Or

- | | | | | |
|---|--|---|---|----|
| b | <p>It is required to produce a hole 15 mm in dia and 10 cm deep through the mild steel piece. Estimate the time taken for completing the hole in the following two cases.</p> <p>(i) The hole is drilled by a 15 mm drill .Assume the cutting speed for the mild steel to be 30 m/min and the feed for 15 mm drill to be 0.2 mm/rev.</p> <p>(ii) First, a 10 mm hole is drilled which is then brought to accurate size by boring. Assume the cutting speed for boring and drilling to be 30 m/min. The feed for 10 mm drill to be 0.15 mm/rev and the feed for the boring operation to be 0.13 mm/rev.</p> | 5 | 5 | 15 |
|---|--|---|---|----|