Reg. No.													

Question Paper Code	11621

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Fifth Semester

Mechanical Engineering

20MEEL514 - PROCESS PLANNING AND COST ESTIMATION

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Recall the stages in machine selection process.	*2,K1,CO1*
2.	Classify various approaches of process planning.	*2,K2,CO1*
3.	Memorize the purpose of work holding device.	*2,K1,CO2*
4.	Recognize the meaning of break-even analysis.	*2,K1,CO2*
5.	Write the objectives of cost estimation.	*2,K1,CO3*
6.	What is prime cost?	*2,K1,CO3*
7.	Reproduce the flash loss in forging operation.	*2,K1,CO4*
8.	Match the expression for power consumption cost in arc welding process.	*2,K1,CO4*
9.	What is meant by machine timing?	*2,K1,CO5*
10.	Infer the expression for drilling and boring machining time operation.	*2,K2,CO5*

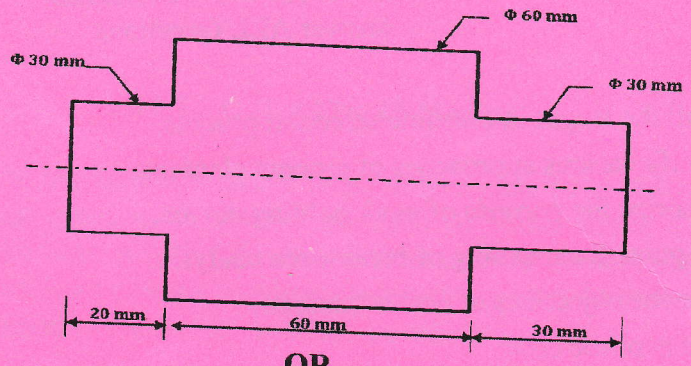
PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Describe in detail the various process planning activities.	*13,K2,CO1*
		OR	
	b)	Illustrate the components of retrieval type CAPP system with a block diagram.	*13,K2,CO1*
12.	a)	Estimate the types of basic quality strategies with an example.	*13,K2,CO2*
		OR	
	b)	Extend the types of jigs and fixtures with neat diagram and the clamping effectiveness.	*13,K2,CO2*
13.	a)	Discuss in detail about various elements involved in costing.	*13,K2,CO3*
		OR	

b) A company has purchased a bus for its officers for Rs. 10,00,000. The expected life of the bus is eight years. The salvage value of the bus at the end of its life is Rs. 1,50,000. Find the following using the sinking fund method of depreciation (i=10%): *13,K2,CO3*
(i) Depreciation at the end of the third and fifth year.
(ii) Book value at the end of the second year and sixth year.

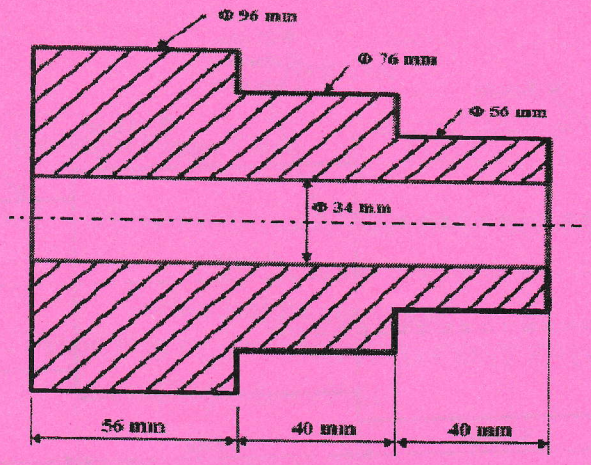
14. a) 500 shafts as shown in figure are to be drop forged from a bar stock of diameter 30 mm. calculate the selling price by assuming, *13,K2,CO4*
(i) Material Cost Rs. 125/m.
(ii) Forging Cost Rs. 0.025/cm^2 of surface area to be forged.
(iii) Overhead Charges 50% of material cost.
(iv) Profit is =25% of total cost.



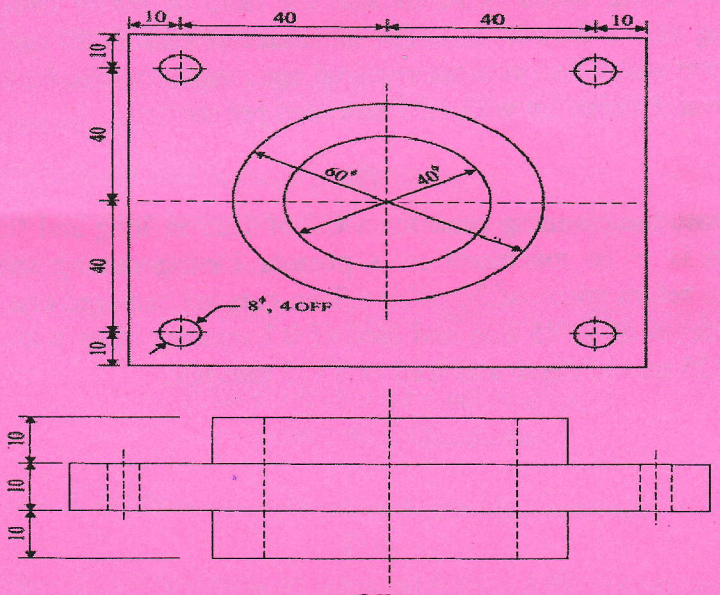
OR

b) Find the selling price of CI pulley as shown in figure. Its surfaces are to be machined after casting. The pattern is supplied by the customer. The pattern which costs Rs. 5000 can produce 1000 units before being scraped. The following data can be used, *13,K2,CO4*
(i) Density of the material is 8g/cc.
(ii) Cost of molten metal at cupola spout is Rs.30/kg.
(iii) Process scrap is 20% of net weight.
(iv) Scrap return value is Rs. 7/kg.
(v) Administrative overhead is Rs. 20/hour.
(vi) Sales overhead is 20% of factory cost.
(vii) Profit is 20 % of factory cost.
(viii) Other expenditure

Operation	Time (min)	Labor Cost / hour	Shop Overhead / Hour
Moulding & Pouring	15	Rs. 40	Rs. 35
Shot Blasting	5	Rs. 35	Rs. 30
Fettling	6	Rs. 30	Rs. 30

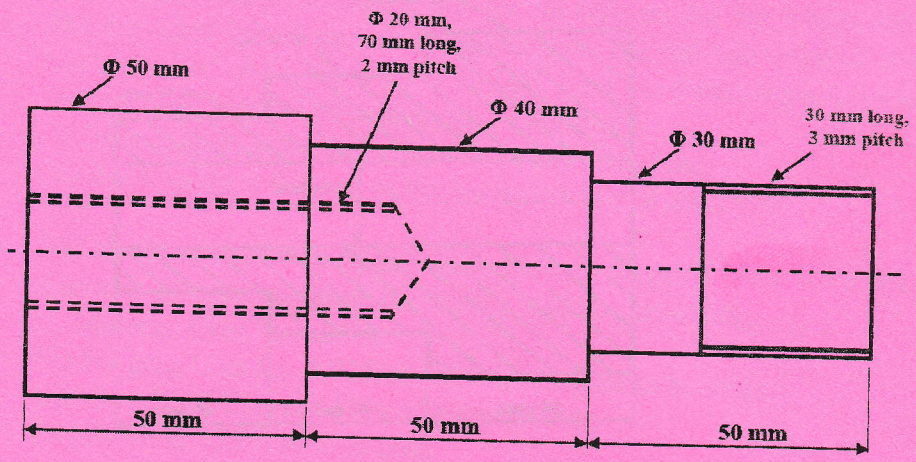


15. a) Calculate the machining time to drill four 8 mm dia holes and one 40 mm dia central hole in the flange shown in Fig. 20 mm dia hole is drilled first and then enlarged to 40 mm full hole. Take cutting speed 10 m/min, feed for 8 mm, drill 0.1 mm/rev, for 20 mm and drill feed is 0.2 mm/rev for 40 mm drill feed is 0.4 mm/rev. *13,K2,CO5*



OR

b) Find the machining time to complete the job as shown in the figure from a basic raw material of 60 mm and length 150 mm. For Turning: Cutting Speed = 25 m/min, feed rate = 1 mm/rev, Depth of cut = 2 mm. For Thread Cutting: Cutting Speed =10m/min, For Drilling: Cutting Speed=25m/min, feed rate=0.2mm/rev. *13,K2,CO5*



PART - C (1 × 15 = 15 Marks)

16. a) Estimate 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 stroke time is 2: 3. The clearance at each is 20 mm long and 165 mm wide. Two cuts are required one rough cut with feed 2 mm per stroke and finish cut with 1.25 mm feed per stroke. *15,K2,CO6*

OR

b) Estimate the planning time for a C.I of 1.25 m long and 0.5 m wide which is to be machined on a planner having cutting speed of 12 m/min return speed of 30 m/min. Two cuts are required one rough cut with depth of 3.125 mm and feed of 0.1 mm/rev other with finish cut of 0.125 mm of depth and feed of 0.125 mm/rev. *15,K2,CO6*