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Question Paper Code : 30934

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Seventh/Eighth/Ninth Semester

Mechanical Engineering

ME 8793 – PROCESS PLANNING AND COST ESTIMATION

(Common to Manufacturing Engineering/Material Science and
Engineering/Mechanical Engineering (Sandwich)/Mechanical and Automation
Engineering/Mechatronics Engineering/Production Engineering/
Robotics and Automation)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a manufacturing system?
2. Write a short note on break even analysis.
3. Which of the factors considered for the tooling decision are the most influential on the calculation of the process parameters?
4. What change could be made on the equipment selection to eliminate the need for a jig?
5. Why costing is important in manufacturing sector?
6. What are the three stages of estimating procedure?
7. Why allowances are required in pattern?
8. What are the difference in estimating cost of arc and gas welding component?
9. What do you understand by the term 'approach length' and 'over travel' of a milling cutter?
10. What are the two factors comprise drilling time?

PART B — (5 × 13 = 65 marks)

11. (a) What are the four traditional approaches to manufacturing systems? Briefly describe each one.

Or

- (b) Explain the importance of process planning with reference to production control.

12. (a) List and Explain the information and documents required for process planning.

Or

- (b) The following information is available for two machines in a workshop.

Item of Expenditure	Machine – I	Machine – II
	Rs.	Rs.
Tooling cost	1500	8000
Operating labour cost/hr	20	8
Cycle time per piece	10 min	5 min
Setting up cost	200	2000
Overheads	200	3500
Maintenance per hour	14	120
Power charges per hour	12	18

Draw break-even chart for the two machines and find out break-even quantity. Also find out which process is suitable for producing 60000 items.

13. (a) List and explain the various methods of costing with example for each.

Or

- (b) Explain with an example the various constituents of estimating the cost of a product.

14. (a) Estimate the time required for making an open tank of size 50 × 50 × 50 cm by gas welding size of the sheets used in 60 × 50 × 0.3 cm. Welding is to be done on inner sides only. Assume fatigue allowance to be 5%.

Or

- (b) Explain in detail the various losses considered while calculating the cost of a forged component.

15. (a) Explain the planning time for a casting 1.5 m long and 0.75 m wide, which is machined on a planner having cutting speed of 14 m/min and a return speed of 35 m/min. Two cuts are required one roughing with a depth of 3.25 mm, a feed of 0.2 mm/rev and other finishing with a depth of 0.175 mm and using a feed of 0.12 mm/rev.

Or

- (b) Find the time required for rough grinding of a 15 cm long steel shaft to reduce its diameter from 4 cm to 3.8 cm, with a grinding wheel of 2 cm face width. Assume wheel traverse speed at 15 cm/min the depth of cut is not to exceed 0.25 mm and total over travel is 0.5 cm.

PART C — (1 × 15 = 15 marks)

16. (a) Estimate the weight and cost of the mild steel casting shown in Fig. 1. Assume density of steel as 7.85 gm/cm³ and the steel cost as Rs. 11 per kg.

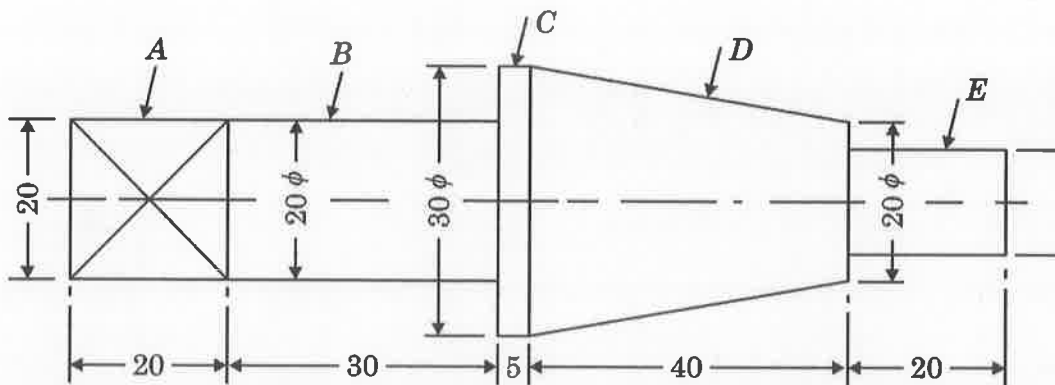


Fig. 1

Or

- (b) Calculate the machining time for different Lathe operations of your choice.