Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 40807

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

Fifth/Sixth Semester

Mechanical Engineering

CME 396 – PROCESS PLANNING AND COST ESTIMATION

(Common to : Industrial Engineering and Management/Manufacturing Engineering/ Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering/Mechatronics Engineering/Robotics and Automation)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define process planning.

2. List the factors considered in tooling selection for machining a component in an automated process planning environment.

3. Brief the term administrative expenses.

4. Outline the functions of route sheet in a shop floor.

5. A manufacturing concern produces 600 machines per year. If the total overheads during that year was Rs. 1,80,000, calculate the overhead cost for each machine by unit rate method.

6. Define man hour and machine hour rate.

7. Define pattern allowances in foundry sector.

8. Distinguish between welding and soldering.

9. Compare the parameter of cutting speed in regards to facing and turning operations.

10. Write down the formulas for calculating machining time for milling operations.

PART B — (5 × 13 = 65 marks)

11. (a) With a case example, outline the steps in CAPP steps with a sample product manufactured in a batch production. (13)

Or

(b) Interpret the steps in converting given design drawing in to manufacturing requirements with an illustrative case example. (13)

12. (a) Develop the process parameters calculation for the production process of a gear box which is manufactured in a modernized shop floor. (13)

Or

(b) Outline the parameters in consideration with the selection of jigs and fixtures for an aircraft component manufactured in general planning procedures. (13)

13. (a) Illustrate the step by step procedure for doing cost estimation for a new product of your own. (13)

Or

(b) Elaborate about an concept of appreciation and depreciation for a sample of product of your own with an case example. (13)

14. (a) Explain various types of losses incurred at estimation of forging shop with examples. (13)

Or

(b) Discuss the procedure for production cost estimation of welding shop with a suitable case example for a modern welding. (13)

15. (a) Illustrate the steps in finding machining time for an sample component which consists of following operations,

(i) Drilling and Tapping (6)

(ii) Boring and Taper turning (7)

Or

(b) Explain the steps in calculating machining time for shaping and planning operation with an illustrative numerical case example. (13)

PART C — (1 × 15 = 15 marks)

16. (a) A wedge block shown in below figure 16 (a) is being manufactured. Estimate the material weight of the block if the mild steel weighs 7.8 g/cu.cm. Allowance for finishing purposes is 15% of the finishing material.

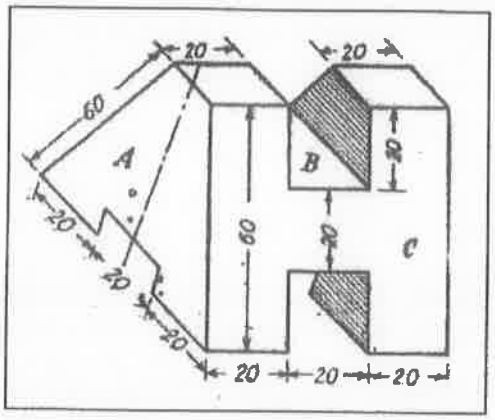

Figure 16 (a) All the given dimensions are in 'mm'

Or

(b) Calculate the machining time required to produce one piece of the component as shown in figure 16 (b) from 25 mm bar.

The following data are available.

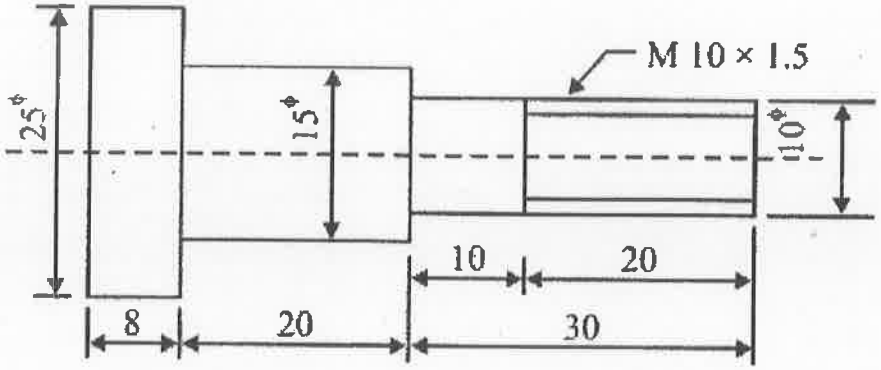

Figure 16 (b) All the given dimensions are in 'mm'

For turning

Cutting speed = 40 m/min

Feed = 0.4 mm/rev

Depth of cut = 2.5 mm/pass

For threading

Cutting speed = 8 m/min