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**Question Paper Code : 50820**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Sixth/Seventh/Eighth Semester

Mechanical Engineering

ME 6005 – PROCESS PLANNING AND COST ESTIMATION

(Regulations 2013)

(Common to : Manufacturing Engineering / Mechanical and Automation Engineering / Production Engineering / Robotics and Automation Engineering)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. List the objectives of process planning.
2. What is bilateral tolerance ? Give examples.
3. What are the most influential factors in terms of tool performance ?
4. What are the main reasons for using jigs and fixtures ?
5. Distinguish between cost estimation and cost accounting.
6. Classify the allowances considered in cost estimation.
7. Define roll forging.
8. Give the formula for calculating the cost of power consumed in arc welding.
9. Write short notes on tear down time.
10. Give the formula for estimation of machining time for drilling.



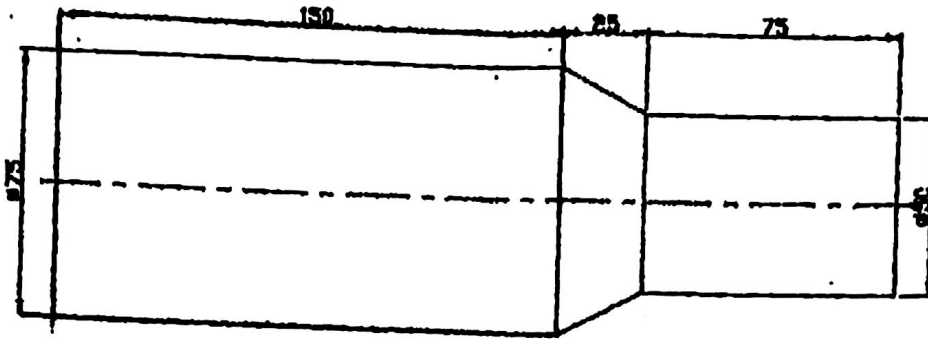
## PART – B

(5×16=80 Marks)

(Question No. 11 is Compulsory)

11. a) Describe the set of documents required for Process Planning. (16)  
(OR)
- b) Explain the steps in process selection with suitable example. (16)
12. a) Describe the steps or procedures involved in process planning. (16)  
(OR)
- b) Describe the basic method employed for the selection of cutting tools. (16)
13. a) Calculate the selling price per unit from the following data : Direct material cost = Rs. 8,000, Direct labour cost = 60 percent of direct material cost. Direct expenses = 5 percent of direct labour cost, Factory expenses = 120 percent of direct labour cost, Administrative expenses = 80 percent direct labour cost, Sales and distribution expenses = 10 percent of direct labour cost, Profit = 8 percent of total cost, No. of pieces produced = 200. (16)  
(OR)
- b) Describe the various components of job estimate. (16)
14. a) Calculate the welding cost for a cylindrical boiler drum  $2\frac{1}{2}\text{m} \times 1\text{m}$  diameter which is to be made from 15 mm thick mild steel plates. Both the ends are closed by arc welding of circular plates to the drum. The cylindrical portion is welded along the longitudinal seam and welding is done both inner and outer sides. Assume the following data : (i) Rate of welding = 2 meters per hour on inner side and 2.5 meters per hour on outer side (ii) Length of electrodes required = 1.5 m/ meter of weld length (iii) cost of electrode = Rs. 0.60 per meter (iv) Power consumption = 4 kWh/meter of weld (v) Power charges = Rs. 3/kWh (vi) Labour charges = Rs. 40/hour (vii) Other overheads = 200 percent of prime cost (viii) Discarded electrodes = 5 percent (ix) Fatigue and setting up time = 6 percent of welding time. (16)  
(OR)
- b) i) What are the various losses considered while calculating the material cost for a forged component ? Explain. (12)
- ii) List the various sections that will be normally found in a foundry shop. (4)

15. a) Consider the component as shown in the figure. The component is to be made from mild steel with carbide tooling at a constant surface speed of 100 m/min. on a lathe with a maximum spindle speed of 1500 rev/min. The machining allowance is 2 mm. Determine : (i) if the lathe is capable of turning the component at the required surface speed (ii) the total machining time for the component if the lathe is capable. (16)



(OR)

- b) i) Find the time required on a shaper to machine a plate 600 mm  $\times$  1,200 mm. If the cutting speed is 15 meters/min. The ratio of return stroke time to cutting time is 2 : 3. The clearance at each end is 25 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 mm per stroke. (8)
- ii) A T-slot is to be cut in a Cast Iron slab as shown in figure. Estimate the machining time. Take cutting speed 25 m/min, feed is 0.25 mm/rev. Diameter of cutter for channel milling is 80 mm. (8)

