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

R 3438

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Seventh Semester

(Regulation 2004)

Mechanical Engineering

ME 1007 — PROCESS PLANNING AND COST ESTIMATION

(Common to Production Engineering)

(Common to B.E. (Part-Time) Sixth Semester Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define method study.

2. Write down any two important applications of work measurement.

3. Brief about scope of process planning.

4. What are the documents used in process planning?

5. What is manufacturing logic?

6. Define costing.

7. List the types of estimates.

8. Brief about indirect material cost.

9. What is administrative overhead?

10. Find the weight of steel sphere of diameter 140mm taking steel density as 7150 Kg/m^3.

PART B — (5 × 16 = 80 marks)

11. (a) State and explain major principles of motion economy. (16)

Or

(b) (i) Describe the procedure for stop watch time study. (8)

(ii) Explain the applications of ergonomics. (8)

12. (a) List and explain process planning activities. (16)

Or

(b) (i) Describe material selection parameters. (6)

(ii) Determine the time to face mill a C.I. casting 1.2 m long and 266.7 mm wide, considering start and end allowances. Assume the following:

No. of teeth in the cutter	:	32
Cutter diameter	:	375 mm
Spindle speed	:	75 rpm
Table feed	:	287.5 mm per minute. (10)

13. (a) (i) State and explain objectives of cost estimation. (8)

(ii) What are different classifications of cost? Explain. (8)

Or

(b) (i) Describe cost accounting with an example. (8)

(ii) Explain major elements of cost. (8)

14. (a) Explain various methods of estimates. (16)

Or

(b) (i) Discuss data requirements and sources for cost estimation. (10)

(ii) Write short notes on cost allowances in estimation. (6)

15. (a) (i) For manufacture of 1000 bolts and nuts per hour, a factory incurs following expenses:

Direct Material cost	:	Rs.350
Direct labour cost	:	Rs.200
Direct expenses	:	Rs.75
Factory over heads	:	150% of labour cost
Office overheads	:	30% of factory cost

Determine whether the factory is making profit or loss in selling one set of bolt and nut for Rs.1. (8)

(ii) A welded platform top is made by 20 mm steel plates requiring 10 joints of 1 metre length each. Welding is done on one side only by arc welding process. Labour charges are Rs.15 per hour. Electrode required per metre run in 2.5 m and costs Rs.6 per metre. Power consumption is 6 Kwhr per metre of the weld and cost Rs. 3 per Kwhr. Time for welding 1 m length is 18 min. Assuming over heads as Rs.10 per hour, calculate welding expenses. (8)

Or

(b) (i) Determine selling price of a component made from steel bar 50 mm long and 20 mm in diameter machining time as $1\frac{1}{2}$ hour.

Assume the following:

Steel Density	:	8000 Kg/m^3
Steel cost	:	Rs.60/ Kg
Labour cost	:	Rs.15/hour
Overheads	:	100% of labour cost
Profit	:	20% of total cost (6)

(ii) 150 pieces of a stepped shaft are to be drop forged from raw stock of 20 mm diameter. Estimate the cost assuming the following:

(1) Shaft size : Step on left :10 mm diameter × 75 mm long
Step in the middle :20 mm diameter × 125 mm long
Step on right : 10 mm diameter × 75 mm long

(2) Material cost : Rs.200 metre

(3) Cost of forging : Rs.1200 per sq.metre of forged surface

(4) Over heads :100% of forging cost.

Consider scale loss, shear loss, flash loss, tong hold loss and sprue loss while making required assumptions. (10)
