775 Register No.:

October 2018

Time – Three hours
(Maximum Marks: 75)

[N.B: (1) Q.No. 8 in PART – A and Q.No. 16 in PART – B are compulsory. Answer any FOUR questions from the remaining in each PART – A and PART – B

(2) Answer division (a) or division (b) of each question in PART – C.

(3) Each question carries 2 marks in PART – A, 3 marks in Part – B and 10 marks in PART – C.]

PART – A

1. State the factors affecting process planning.
2. What is the need of line balancing.
3. Mention the factors that affecting the process selection.
4. What is micro motion study?
5. What are the objectives of work measurement?
6. Name the various methods by which the overheads can be estimated.
7. Define setup time and machining time.
8. A shaft of 35 mm diameter is turned at a cutting speed of 50 m/min. Determine the speed of the shaft.

PART – B

9. State the difference between cost control and cost reduction.
10. How will you determine the man power requirement?
11. State any three objectives of method study.
12. State the applications of ergonomics. Explain briefly any one.
13. Explain performance factor.
14. Differentiate between feed and depth of cut.
15. A CI flange 400 mm outer diameter has a bore of 120 mm. This is to be faced on a lathe. Calculate the machining time to face the part, given the feed 0.8 mm/rev and cutting speed 30m/min.

[Turn over.....

16. A tool will cut for 6 hours before it needed re-sharping. It takes 20 minutes to change the tool. If the tool can be sharpened 12 times before it is discarded, determine the unit tool change time per cycle.

PART – C

17. (a) A company is buying a component for ₹. 40 per unit. The annual requirement of that component is ten thousand units. If it is made in the factory it self, the variable cost is ₹. 20 per unit. Additional fixed cost will be ₹. 2, 25,000 per year. Can we stop buying and make the component in factory it self? What is the minimum quantity to be produced to avoid loss?

(Or)

(b) Explain briefly the procedure involved in value analysis.

18. (a) What is process selection? Explain the following in process selection. (i)Technological choice (ii)Specific component choice and (iii)Process flow choice.

(Or)

(b) A semi automatic turret lathe costs ₹.80,000 and it produces 16 pieces per hour and its operator receive ₹. 2 per hour. An engine lathe which costs ₹. 32,000 produces 10 pieces per hour and its operator receives ₹. 2.50 per hour. Calculate the minimum number of pieces which makes turret lathe more economical.

19. (a) Explain SIMO chart, cycle graph and chrono cycle graphs.

(Or)

(b) The data given below refers to the time study conducted for an operation. The table shows the actual time for elements in minutes.

Elements	Cycle time in minute				
	1	2	3	4	5
1	3.2	3.1	5.2	3.3	3.2
2	2.3	2.0	2.1	2.1	2.2
3	7.1	7.0	6.9	7.1	7.2
4	2.5	2.6	2.7	2.8	2.9

(i) Element 3 is a machine element.
(ii) If any timing is more than 20% of the average time for the element, it can be treated as abnormal and omitted.
(iii) Take the performance ratting of the operator as 110.
(iv) Allow personal allowance of 20 min. in a shift of 8 hrs.
(v) Allow fatigue allowance of 15% and contingency allowance of 5%. Estimate the standard time and calculate the production per shift.

20. (a) Explain with a block diagram about how the selling price of a product is arrived at.

(Or)

(b) 40 castings are to be machined in 5 setups. Calculate the cost of production with the help of the following given data:

Machining time	=10min/casting;
Non-machining time	=20min/casting;
Setup time	=45min/setup;
Tool sharpening	=5min/casting;
Fatigue allowance	=20%;
Personal needs allowance	=10%;
Total change time	=12min;
Tool life	=8 hours;
Checking time	=15sec with 5checks/casting;
Performance factor	=1.5;
Direct labour cost	=₹. 8/hours.

21. (a) Calculate the time taken for shaping a CI block 500mm long and 400mm wide in a single cut. Feed is taken to be 1.5 mm per stroke and cutting speed is 10m/min. The return time to cutting time ratio is 3:5. Assume length wise and width wise clearance 25mm each.

(Or)

(b) A 200 X 50mm CI surface is to be faced on milling machine with a cutter having a diameter of 100mm and 16 teeth. If the cutting speed and feed are 50m/min and 50mm/min respectively, determine the milling time, rpm of the cutter and feed per tooth.
