PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 80   Max Time: 120 Mins   Weightage: 40 %

END TERM FINAL EXAMINATION

I Semester AY 2017-18   Course: **MEC 204 Production Techniques**   19 DEC 2017

Instructions: (i) Answer all Questions.
(ii) Figures are not to scale.
(iii) Draw neat sketch wherever necessary.

Part A

(6Q x 5M= 30Marks)

1. Explain the functions of Jigs and Fixtures

2. What is the basic concept involved in break-even-analysis? List out the different methods of reducing the BEP.

3. List out the advantages and disadvantages of Electro Chemical Machining (ECM)

4. What is Inventory control? List out consequences of taking wrong decisions on inventory control.

5. List out the function and characteristics of electrolyte.

6. Explain the need for the use of unconventional machining processes compared to the conventional ones.

Part B

(5Q x 6M= 30 Marks)

7. Explain Product layout facility system used in industrial organization.

8. Briefly explain the Direct (Forward) and Indirect (Indirect) extrusion process in metal forming.

9. A certain component can be manufactured either by welding or by forging process. The factory has an order for 7,00,000 units. The costs involved for two methods of manufacturing are as follows:

	Welding	Forging
Fixed Cost	Rs. 17,000	Rs. 98,000
Variable cost/unit	Rs. 4.75	Rs. 5.50

Which is the most economical method of manufacturing the components? What will be the loss if a wrong choice is made?

10. Briefly explain the working of an Ultrasonic machining (USM) process showing important elements.

11. Briefly explain the flushing techniques used in Electric Discharge Machine (EDM).

12. Describe the process of Electron Beam Machining (EBM) with neat Sketch and list out the advantages and disadvantages.

13. A component shown in fig.1 below is to be machined on a CNC machine along the face ABCDEFGHA. Write the positional commands, if (a) Absolute system is used & (b) Incremental system is used. Assume, path of movement of tool as O-A-B-C-D-E-F-G-H-A-O (O-origin) and 'O' as reference point.
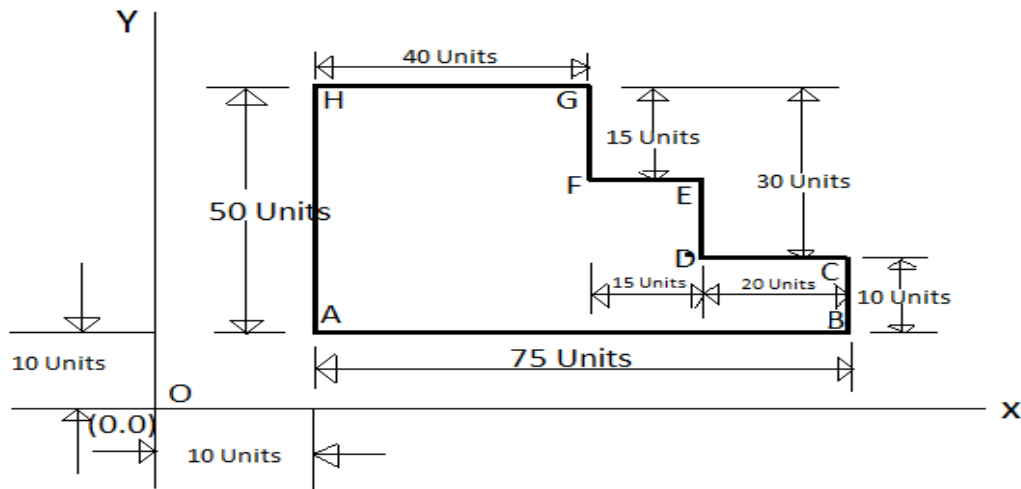

Fig. 1

Max Marks: 40   Max Time: 60 Min   Weightage: 20 %

TEST 2

I Semester AY 2017-2018   **MEC 204- Production Techniques**   26th October 2017

Note: Answer all Questions.
.

Part A

(4 Q x 5M= 20 Marks)

.

1. List the difference between Up milling and Down milling.

2. What is Honing. Explain the Honing process in detail.

3. List the application of following abrasive materials

   a) Corundum   b) Emery   c) Silicon Carbide   d) Cubic boron nitride   e) Diamond

4. What is Indexing. Explain the simple indexing method to generate gears on the work piece.

Part B

(2Q x 6M= 12 Marks)

5. Explain how the Spindle alignment test carried out by taking examples of any machine.

6. Estimate the time required to machine a cast iron surface 325 mm long and 120 mm wide on a shaper with cutting-to-return ratio of 3/2. Use a cutting speed of 25 m/min, a feed of 1.5mm/stroke and a clearance of 20 mm. The available ram strokes on the shaper are: 28, 40, 60 and 90 strokes/min. Also, determine MRR assuming depth of cut as 4 mm.

Part C

(1Q x 8M = 8 Marks)

7. With a flow chart explain the Methodology developed by Boothroyd and Dewhurst for DFMA (Design for manufacture and assembly).

Max Marks: 40   Max Time: 60 Min   Weightage: 20 %

TEST 1

I Semester 2017-2018   MEC 204- Production Techniques   18th September 2017

Note: (i) Answer all Questions.
 (ii) All dimensions are in mm and figures are not to scale.

.

Part A   (4 Q x 5M= 20 Marks)

1. Discuss in brief the different types of chip formed in machining process.
2. With a neat sketch explain the geometry of a single point cutting tool.
3. With a neat sketch explain the importance of positive rake angle and negative rake angle.
4. Calculate the time required to drill a hole of 25 mm diameter in a 60 mm thick plate. Assume the cutting speed to be 14 m/min. and feed of 0.3 mm/rev as shown in fig (a). Assume length of approach and over travel as 5 mm.
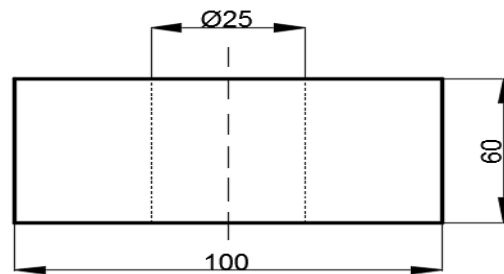

Fig. (a)

Part B   (2Q x 6M= 12 Marks)

5. List the different method of taper turning operation and explain any one method with neat sketch.
6. A carbide-cutting tool when machined with mild steel work piece material at a cutting speed of 60 m/min lasted for 90 minutes. Determine the life of the tool when the cutting speed is increased by 20 %. At what speed the tool is to be used to get a tool life of 200 minute. Assume $n = 0.26$ in the Taylor's expression.

Part C   (1Q x 8M = 8 Marks)

7. With a neat sketch explain the different cutting forces involved in cutting process in Merchant circle diagram