

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech. Winter 2019 - 20 Examination**

**Semester: 3****Subject Code: 03109203 / 203109205****Subject Name: Manufacturing Processes****Date: 29/11/2019****Time: 2:00pm to 4:30pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Objective Type Questions - ( Fill in the blanks, one word answer, MCQ-not more than Five in case of MCQ) (All are compulsory) (Each of one mark) (15)**

1. The chips are not produced while doing which operation out of mentioned below.  
(a) Grooving (b) Turning (c) Parting (d) Knurling
2. A twist drill is a  
(a) side cutting tool (b) end cutting tool (c) front cutting tool (d) none
3. The main purpose of a boring operation, as compared to drilling is to  
(a) drill a hole (b) finish the drilled hole (c) correct the hole (d) enlarge the existing hole
4. Lathe bed is made of  
(a) high speed steel (b) high carbon steel (c) cast iron (d) mild steel
5. A flat surface can be produced by a lathe machine, if the cutting tool moves \_\_\_\_\_  
(a) parallel to the axis of rotation of work piece (b) perpendicular to the axis of rotation of work piece (c) at an angle of  $45^\circ$  (d) none of the above
6. The process of chamfering the entrance of a drilled hole is known as \_\_\_\_\_.
7. The rake angle of carbide tool is usually kept \_\_\_\_\_. (negative, positive, neutral)
8. The point angle of a twist drill is \_\_\_\_\_.
9. For making taper of long and slender work piece on a lathe, \_\_\_\_\_ method is used.
10. While machining cast iron \_\_\_\_\_ type of chip is produced.
11. What is the time taken to drill a hole through a 25 mm thick plate with the drill rotating at 100 rpm and moving at a feed rate of 0.25 mm/revolution?
12. What is the equation to calculate the cutting speed in case of a simple turning operation on a lathe machine?
13. Which types of surfaces can be generated on a shaper machine?
14. Under which circumstances, you will prefer machining by grinding operation?
15. What is the meaning of 18-4-1HSS?

**Q.2 Answer the following questions. (Attempt any three) (15)**

- A) Classify different type of chips and explain them.
- B) With the help of neat sketch, explain jig boring machine.
- C) A 500 mm X 100 mm flat surface of a plate is to be machined on a shaper. The plate has been fixed with the 500 mm side along the tool travel direction. If the tool over travel at each end of the plate is 10 mm, average cutting speed is 8 m/min, feed rate is 0.3 mm/stroke and the ratio of return to cutting time of the tool is 2:1, calculate the time required to machine the flat surface.
- D) 200 shafts of steel 58 mm diameter and 150 mm length are to be turned on a lathe in one cut each using carbide tool. The suggested speed and feed for the above job are 1.67 m/s and 0.25 mm/rev. Calculate the total time required for the lot allowing 2 minutes for centre hole drilling and 2 minutes for handling for each one piece. The spindle speeds available on the machine are 140, 200, 280, 400, 560 and 800 rpm.

**Q.3 A) What are the advantages and limitations of broaching? Draw neat sketch of broaching tool or broaching machine and label its parts. (07)**

- B) What is up milling and down milling? Draw the neat sketch of column and knee type milling machine and label its parts. (08)**

**OR**

B) What is the difference between Cylindrical grinding and Centreless grinding process? Explain cylindrical grinding with its applications. (08)

Q.4 A) What are the advantages, limitations and application of sand casting process? Discuss shrinkage allowance. (07)

**OR**

A) What are the different drilling operations? (07)

A hole with 40mm diameter and 50 mm depth is to be drilled in mild steel component. The cutting speed can be taken as 65 m/min and the feed rate as 0.25 mm/revolution. Calculate the machining time and the material removal rate. Take  $A = D/3.3286$ .

B) Explain with the neat sketch, the investment casting process. State the advantages. (08)