

**College of Engineering, Pune – 5.**  
**(An Autonomous Institute of Government of Maharashtra)**

**END-SEMESTER EXAM**  
**Machining Science and Technology (PE 204)**

Programme: S.Y.B. Tech. (Production)  
Semester: Summer Term  
Duration: 3 Hrs.

Year: 2011–12  
Date: 12/5/2012  
Max. Marks: 50

Instructions:

1. Figures to the right indicate full marks.
2. Draw neat sketches wherever required.
3. Use of pocket calculators is allowed.

|     |    |   |   |
|-----|----|---|---|
| Q.1 | a. | Draw and explain merchant's circle for cutting forces in metal cutting and the assumptions made in it.          | 5 |
|     | b. | What is the effect of speed, feed and depth of cut over the cutting forces? Explain with suitable graphs.       | 5 |
|     |    | OR  |   |
|     | c. | What is the effect of shear angle over chip thickness and explain the procedure to calculate the shear angle.   | 5 |
| Q.2 | a. | Explain thrust and torque calculations in drilling operation.   | 5 |
|     | b. | Show with neat sketches the geometrical features of a Pull Broach and label the important features.             | 5 |
|     |    | OR  |   |
|     | c. | Explain how the broaching machines are classified and write a short note on Horizontal broaching machine.       | 5 |
| Q.3 | a. | Explain the process of Gear Shaping and Shear Speed process with suitable neat sketch.                          | 5 |
|     | b. | Describe the various processes used for gear finishing.   | 5 |
|     |    | OR  |   |
|     | c. | Explain following methods of gear manufacture:<br>a. Extrusion b. Cold Working c. Stamping d. Powder metallurgy | 5 |
| Q.4 | a. | What is EBM? Sketch its set up and indicate its main parts and explain the principle.                           | 5 |
|     | b. | Explain the method of AJM with help of schematic diagram and state its applications.                            | 5 |
|     |    | OR  |   |
|     | c. | Explain in detail the ECM process with neat sketch and also mention its advantages.                             | 5 |
| Q.5 | a. | Describe the process of external thread manufacturing on lathe machine.   | 5 |
|     | b. | Explain thread grinding process and its types with suitable diagram and state its advantages and applications.  | 5 |
|     |    | OR  |   |
|     | c. | Explain the procedure of examination of Plane surfaces using Spirit level and Autocollimator.                   | 5 |