

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME - SEMESTER-I(New course)• EXAMINATION – WINTER- 2015**

**Subject Code: 2712802****Date: 04/01/2016****Subject Name: Machining Science****Time:2:30 pm to 5:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain chip formation with neat sketch for lathe tool. Explain mechanism of built-up-edge formation. **07**  
 (b) Derive the formula for cutting forces using Merchant circle diagram method. **07**
- Q.2** (a) Discuss economics of machining with respect to maximum production rate criterion. **07**  
 (b) Explain the measurement of shear angle based on slip line field theory. **07**
- OR**
- (b) Describe Mohr's circle diagram to measure shear angle. **07**
- Q.3** (a) What is tool wear? Discuss basic three causes of tool wear. **07**  
 (b) Explain geometry of twist drill with neat sketch. **07**
- OR**
- Q.3** (a) What is machinability? Explain factors affecting machinability. **07**  
 (b) Explain geometry of milling cutters with sketch. **07**
- Q.4** (a) Discuss dynamometer requirement for turning. **07**  
 (b) Explain specification of a grinding wheel. **07**
- OR**
- Q.4** (a) What is the mechanics of grinding process? Explain honing and lapping operation. **07**  
 (b) Explain working principle & mechanism of Lathe tool dynamometer with neat sketch. **07**
- Q.5** (a) Explain mechanism of plastic deformation by slip. **07**  
 (b) List various methods to measure tool chip interface temperature and explain tool work thermo-couple technique. **07**
- OR**
- Q.5** (a) List various methods to measure tool chip interface temperature and explain Infrared photographic technique. **07**  
 (b) How to measure rake angles in different planes? **07**

\*\*\*\*\*