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**Eighth Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**Tool Engineering and Design**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting  
atleast TWO questions from each part.**

**PART – A**

- 1 a. Explain the different types of chip formation with neat sketches. (10 Marks)
- b. According to Ernst-Merchants theory, prove that  $\phi = \frac{\pi}{4} - \frac{\beta}{2} + \frac{\alpha}{2}$  with the usual notations. (10 Marks)
- 2 a. Briefly explain the desirable properties of cutting tool materials. (10 Marks)
- b. Explain the following cutting tool materials usage, properties and composition: (10 Marks)
  - (i) High speed steel
  - (ii) Ceramics
- 3 a. With a neat sketch explain the nomenclature of single point cutting tool. (10 Marks)
- b. Explain clearly the design of the profile of a flat form tool with a sketch. (10 Marks)
- 4 a. What are the important angles provided twist drill and explain their influence on the cutting performance. (10 Marks)
- b. Design a profile sharpened milling cutter of arbor diameter 30 mm. (10 Marks)

**PART – B**

- 5 a. A M.S. washer of 20 mm thickness is to be enlarged from 30 mm to 32 mm. Design a sketch the broach. (10 Marks)
- b. Explain clearly the design procedure of Broach. (10 Marks)
- 6 a. Clearly explain 3-2-1 principle of location. (10 Marks)
- b. Explain the following : (10 Marks)
  - i) Pin and button locator
  - ii) Diamond locating pin
- 7 Sketch and explain the following : (20 Marks)
  - i) Latch jig
  - ii) Plate jig
- 8 a. Sketch and explain the gang milling fixtures. (10 Marks)
- b. Discuss the essential features of turning fixtures. (10 Marks)

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