

Roll No.

Total No. of Questions : 09]

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Paper ID [PE308]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 6th/7th)

TOOL & CUTTER DESIGN (PE - 308)

MAY 2008

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 × 2 = 20)

- a) Write the name of different properties of cutting tool materials?
- b) What is the purpose of chip breakers?
- c) What is the magnitude of helix angle for a reamer?
- d) How the number of teeth on a milling cutter is decided?
- e) Define broaching allowance?
- f) What are combination tools?
- g) How the pitch of teeth of a broach selected?
- h) Sketch a twist drill with full nomenclature?
- i) How milling cutters are sharpened?
- j) What factor is recognized as contributing to tool wear more than any other?

Section - B

(4 × 5 = 20)

- Q2) What is 18-4-1 type of cutting tool material? Discuss its properties and specific uses.
- Q3) Why are negative rake angles necessary when taking interrupted cuts with carbide tools?

- Q4)** Explain with neat sketches the nomenclature of a milling cutter?
- Q5)** Discuss the design features of form tools?
- Q6)** Estimate the moment, thrust force and power required for 12.7 mm drill having a feed of 0.254 mm/rev, turning at 100rpm, cutting a steel of Brinell hardness 200. Take $K = 1.10$.

Section - C

(2 × 10 = 20)

- Q7)** The feed of an 8-tooth face mill is 0.033 cm per tooth at 200 rev/min. The material cut is 300 BHN steel. Depth of cut is 0.32 cm and the width is 10 cm. Calculate the (a) HP at the cutter (b) HP at the motor if the efficiency of the machine is 60%.
- Q8)** (a) What are possible causes of oversize holes when drilling?
(b) Sketch the tooth shape of a broach and write briefly about its elements?
- Q9)** (a) What happens when steel is allowed to cool slowly through the transformation range?
(b) How the size of single point cutting tool is designated?

