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Total No. of Questions : 09] [Total No. of Pages : 02

B.Tech. (Sem. - 6th)

TOOL AND CUTTER DESIGN

SUBJECT CODE : PE - 308

Paper ID : [A0223]

[Note : Please fill subject code and paper ID on OMR]

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 x 2 = 20)*

a) Name any two newer cutting tool materials.

b) Why the twist drill is named so?

c) Explain the principle of milling operation.

d) Define the term lip relief angle.

e) Differentiate between profile relieved and form relieved milling cutters.

f) What do you understand from the term hot hardness?

g) What is the use of chip breakers in cutting tools?

h) List the milling cutter principle elements with a sketch?

i) Define the term tool signature of a single point cutting tool.

j) Differentiate between in the use of reamers and core drills.

Section - B

(4 x 5 = 20)

Q2) What are the principal types of twist drills? Describe the geometrical and constructional features of a twist drill with a neat sketch.

Q3) What are the reasons of cutting tools failure? What must be the important properties of cutting tool materials.

Q4) Define and discuss the impact of rake angle, clearance angle, principal cutting edge angle, end cutting edge angle and nose radius on turning operations.

Q5) Describe the different types of gear cutting tools explaining their operational principles.

Q6) Illustrate the constructional details of the reamer. Discuss type of reamers.

Section - C

(2 x 10 = 20)

Q7) Discuss the design procedure to design a single point cutting tool in detail.

Q8) Calculate the cutting length, number of teeth and other geometrical parameters of a broach to be used to cut a keyway 12 mm wide and 6 mm deep in a 50 mm long boss of a job.

Q9) Explain the working principle of a hob used to produce gears. Briefly explain the constructional and geometrical parameters of a hob.