S.E./Mechanical/Sem-IV/CBSGS/PP-II

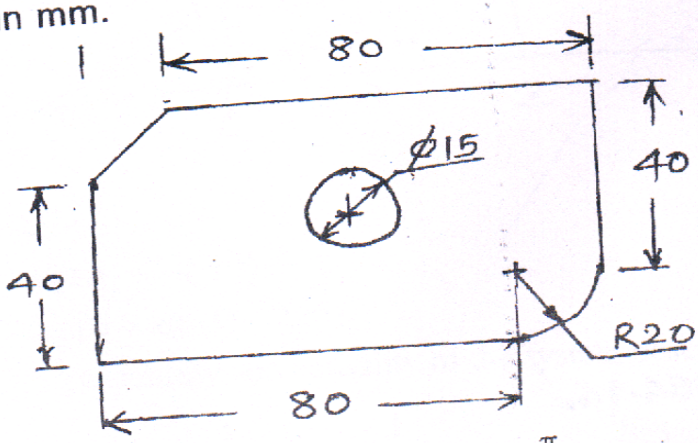
QP Code : 12500

(3 Hours) **[Total Marks : 80**

N.B. : (1) Questions No. **1** is **compulsory.**
(2) Attempt any **three** questions out of remainirig **five** questions.
(3) Assume **suitable** data if **necessary.**
(4) Illustrate your answer with **neat sketches** wherever **necessary.**

1. Attempt any **four** :– **20**
   (a) Show that in metal cutting operation, $Vv = V.\gamma_c$.
   (b) Describe Ratial drilling machine with neat sketch.
   (c) Explain orthogonal rake system.
   (d) Describe internal grinding machine with neat sketch.
   (e) Discuss cutting fluids.

2. (a) Write a part programme using G-code and M code for machining external contour and drilling hole, at the centre as shown in figgur. All dimensions are in mm. **10**



   (b) Derive the relationship $2\phi + \beta \ \gamma = \frac{\pi}{2}$ in merchant's theory, clearly stating the assumptions.

3. (a) Explain the various steps involved in designing circular pull type broach. Draw approprate sketches.
   (b) Derive expression for tool life for minimum cost criteria in metal cutting

4. (a) Describe carbides and ceramics as cutting tools.
   (b) Draw two dimensional tool dynamometer and explain it features.
   (c) List gear manufacturing methods explain any one in detail with neat sketch

[TURN