BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BE **SEMESTER : VI**
BRANCH: PROD **SESSION : SP/17**

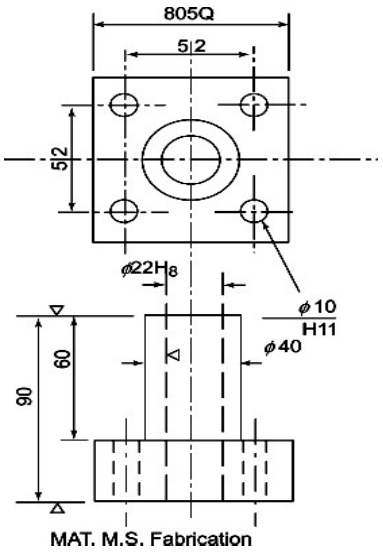
SUBJECT: PE6001 TOOL DESIGN

TIME: 03:00 **FULL MARKS: 60**

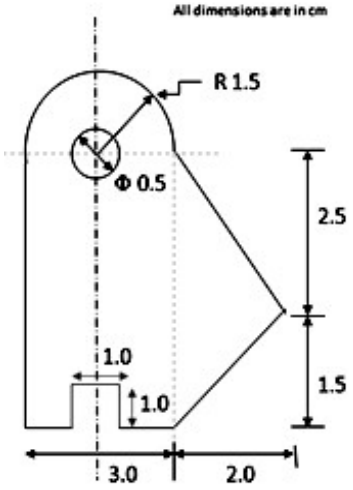
INSTRUCTIONS:
1. **The question paper contains 7 questions each of 12 marks and total 84 marks.**
2. **Candidates may attempt any 5 questions maximum of 60 marks.**
3. **The missing data, if any, may be assumed suitably.**
4. **Before attempting the question paper, be sure that you have got the correct question paper.**
5. **Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**
6. **Nothing should be written on front or back of the question paper except tick marking.**

Q.1(a) Distinguish between complete and partial location with simple examples. [2]
(b) With neat sketch, explain the 3-2-1 principle of location. [4]
(c) What are the main requirements for clamping devices? Discuss the broad principles involved in the design of clamping elements of jigs and fixtures. [6]

Q.2 Analyze the following part drawing. Four holes of 10 mm diameter are to be drilled. Select the best jig for the same. Draw the Jig and write down the locating and clamping methods used by you giving suitable reasons. [12]



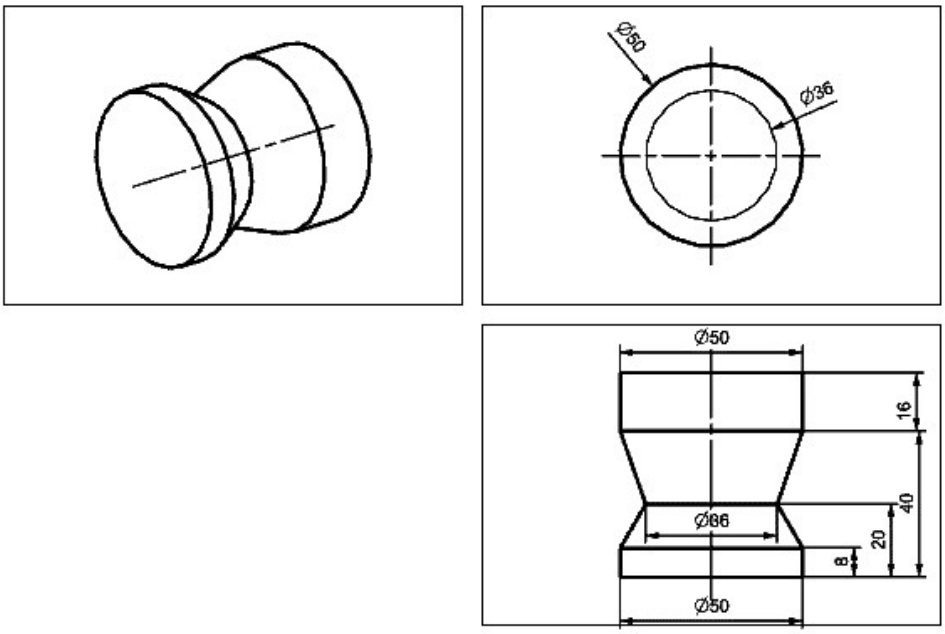
Q.3 Make a progressive die layout. Calculate the center of pressure through which the center line of the ram should pass. [12]



PTO

Q.4 An HSS tool shank is to be designed for turning. The permissible bending stress of the tool material is $75N/mm^2$. Find the cross-sectional dimensions of the rectangular shank. Assume a rectangular shank with a height to width ratio of 1.6 and the tool overhang is 1.5 times the height. The cutting force was measured to be 2500N. Assume the value of the young's modulus to be 200×10^3 N/mm^2. [12]

Q.5 Design a circular form tool for machining of the part shown in the figure. The part is made of steel having σ_u=40 Kgf/cm^2. The axis of the bolt on which the tool is mounted is 10mm above the workpiece axis. The rake and clearance angle of the tool are 20^0 and 10^0 respectively. [12]



Q.6(a) What is the function of a stripper? [2]
(b) Draw a cup drawing die and label its different parts. [4]
(c) Draw neatly and distinguish between a compound die and a combination die. [6]

Q.7(a) What is economics of tooling means? [2]
(b) Name some materials used for Jig and fixture fabrication. [4]
(c) List various types of lathe fixture, explain any two in details [6]

*******24/04/17******M**