Time: 3 Hours   **Marks: 80**

NB.:   (1) Question No.1 is **compulsory**.
                 (2) Attempt **any three** questions from remaining **five** questions
                 (3) Assume **suitable** data if **required**.
                 (4) Figures to the right indicate **full** marks

Q.1   Explain **any five**:-   **20**
        (a)   Feeding systems used in injection molds
        (b)   Plasma Arc Machining
        (c)   Drill bushes used in Jigs
        (d)   IT/IS in Agile Manufacturing
        (e)   Differentiate between Blanking and Piercing with diagram
        (f)   SPM and its applications

Q.2 (a)   Find the Center of Pressure of the component given below using suitable coordinate   **08**
              axis and also design the scrap strip layout, indicating important dimensions for the
              same. Also calculate length of strip for producing 60,000 blanks.
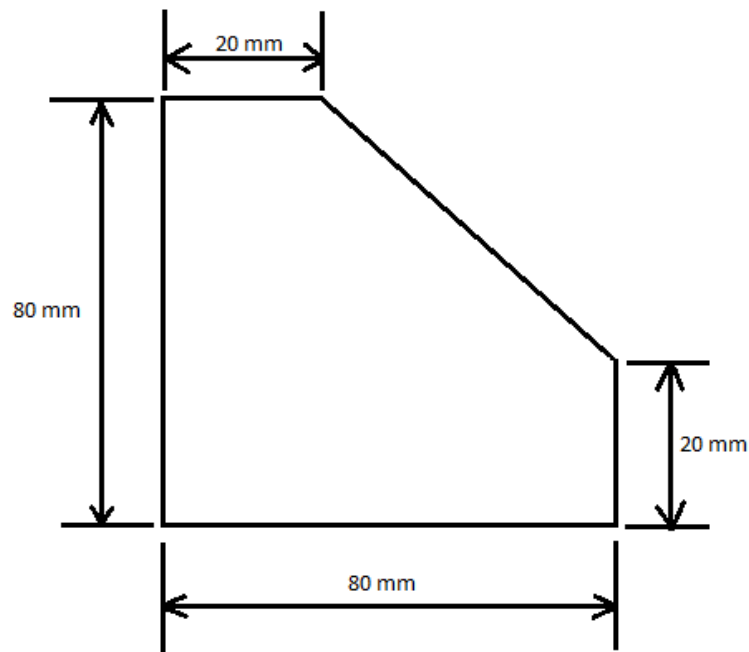
        (b)   What is EBM process? Explain in detail with the help of diagram.   **06**
        (c)   Explain about Indexing mechanisms used in Jigs and Fixtures.   **06**

Q.3 (a) Write short notes on the following: **10**
        (i) 3-2-1 Location principle for Jigs and Fixtures.
        (ii) Drawing Press Tool for sheet metal.

    (b) A deep drawing operation is used to make a cup of diameter 75 mm and length 65 mm and **10** corner radius of 1.6 mm from C.R. steel sheet of thickness 1.7 mm. Calculate the blank size, percentage reduction, number of draws, punch and die radius, corner radius for punch and die, clearance and drawing pressure. Ultimate tensile strength is 400 N/mm², C = 0.67

Q.4 (a) Write about different types of transfer lines using neat sketches. **10**
    (b) What are the different components of Agile Manufacturing? Explain in detail. **10**

Q.5 (a) Explain the following: **10**
        (i) Design principles of clamping elements and any 2 types of clamping elements.
        (ii) Water Jet Machining.

    (b) Explain with the help of neat sketch the working of two plate mold. **05**

    (c) Write about advantages and limitations of Hot Runner injection mold. **05**

Q.6 (a) Write in detail about different types of Milling fixtures and Turning fixtures with neat **10** sketches.

    (b) Explain the following: **10**
        (i) Ultrasonic Machining
        (ii) Ejection System in Injection Molding machine

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