

**B.E. PRODUCTION ENGINEERING
THIRD YEAR
FIRST SEMESTER EXAM 2025**

Mass Production Technology & Automation

Time: 3 Hours

Full Marks - 100

Answer any 5 Questions

Attempting extra questions may attract penalty.

Give sketches, wherever possible.

Answer a Question fully, "i.e., parts a), b) etc.", before attempting the next question.

1. a) Differentiate between the Capstan Lathe & Turret Lathe with description & neat sketches. 10
b) Write the differences between Blanking & Punching. 4
c) What are chucks & collets? Classify them. 6

2. Write shortly on:

- a) Wheel forming (in Thread Grinding),
b) Fly Press,
c) Gear Hobbing Method.

5+5+10=20

3. Write the names of **two** production methods for producing each shape/feature of the following:

Small holes, Curvature on thin sheets, Tubular shapes, Cross sections, Very large parts, Thin hollow shapes, Surface textures, Square edges, Flat surfaces, Detailed surface features.

2X10

4. a) Write short notes on:

- i) Sunderland method;
ii) Gear shaping method.

5+5

b) Using the following values, determine the no. of pieces that would have to be made to justify the use of a jig costing Rs. 1.8 lac; $R = \text{Rs. } 345/-$; $R_t = \text{Rs. } 270/-$; $t_t = 1.25$; $t = 2.5$; $i = 10\%$; $R_m = \text{Rs. } 270/-$; $n = 3$. The notations have their usual meanings.

5

c) Write a short note on Thread Milling.

5

5. a) Describe the following:

i) Interchangeability, ii) Generation of gear by rack.

5+5

b) Explain the following terms giving examples of each:

[Turn over

- Tools or tooling, Job (or station), Production System, Operation or process. 10
6. a) Briefly describe with sketches (if possible):
- i) Automatic gear cutting machine.
 - ii) Circular Die Rolling Process (of producing screw threads) 5+5
- b) Describe the basic elements of adaptive control loop. 3
- c) Describe the “Injection Moulding” process. 7
7. a) Elucidate the following plastic moulding processes using figures:
Positive Mould, Transfer Mould 5+5
- b) What are the different orders of automation? Describe each with examples. 7
 - c) What are the safety arrangements of power presses that are considered while designing it? Explain. 3
8. a) Calculate the blank dia. suitable for rolling to a 60 °vee thread of 12 mm. dia. & 1.25 mm. pitch. Deduce the expression for solving the Problem. 4+6
- b) How is the capacity of a press expressed? Explain. 2
 - c) What are the basic forms of raw materials required for moulding of plastics? Describe each. 8
9. Describe briefly the following processes (with sketches, if possible):
- a) Blow Moulding.
 - b) Screw Thread Grinding.
 - c) Hot compression Moulding.
 - d) Open flash method of moulding. 5X4=20