

Code: 150-4305

PRODN

THIAGARAJAR POLYTECHNIC COLLEGE, SALEM

(Autonomous)

Reg. No.

October/November 2019 Examinations
DIPLOMA IN PRODUCTION ENGINEERING

Special Machines

Year/Sem: III / V (ODD-III)

Max. Marks : 75

Time : 3 hr.

PART-A

(5 x 2 = 10 Marks)

Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.

(ii) All questions carry equal marks.

- 1 What is composite?
- 2 What is calendaring?
- 3 How is the cross feed given in a planer?
- 4 How does a pull broach move while broaching?
- 5 Define face milling.
- 6 What are the types of turning centres?
- 7 What is encoder?
- 8 State the purpose of grinding.

PART-B

(5 x 3 = 15 Marks)

Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.

(ii) All questions carry equal marks.

- 9 Give the basic difference between thermoplastics and thermosetting plastics.
- 10 List the advantages and disadvantages of autoclave processing.
- 11 Explain any two shaper tools.
- 12 Write the specification of slotter.
- 13 How the grinding wheel is designated?
- 14 List the applications and advantages of PAM.
- 15 List the requirements of slide ways.
- 16 Explain about up milling process.

PART-C

(5 x 10 = 50 Marks)

Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question. (ii) All questions carry equal marks.

- 17 A Describe in detail about polymers and liquid crystal polymers. 10
(OR)
B i. Explain the plunger type injection moulding with a neat sketch. 5
ii. Explain the glass fiber manufacturing process with a neat sketch. 5
- 18 A i. Explain the hydraulic drive quick return mechanism of a planer. 5
ii. Explain with a sketch the working of a universal shaper. 5
(OR)
B i. Explain with a neat sketch about the push type vertical broaching machine. 5
ii. Name the various operations in a slotter and explain any two operations. 5
- 19 A Describe with neat sketch the construction and operation of vertical milling machine. State its uses. 10
(OR)
B i. Sketch and explain the nomenclature of plain milling cutter. 5
ii. Explain the gear finishing process a) Gear shaving b) Gear burnishing. 5
- 20 A Explain the working of an external centreless grinder with sketch. State its advantages. 10
(OR)
B Explain Electro chemical grinding process. State its applications and advantages. 10
- 21 A i. Explain with a neat sketch, Horizontal spindle machining centre. 5
ii. Write a short notes on recirculation ball screw used in CNC machines. 5
(OR)
B i. Explain the working of linear transducer. 5
ii. Explain in process probing. 5

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DIPLOMA IN PRODUCTION ENGINEERING

Engineering Metrology

Year/Sem: III / V (ODD-III)

Max. Marks : 75

Time : 3 hr.

PART-A

(5 x 2 = 10 Marks)

Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.

(ii) All questions carry equal marks.

- 1 What are the objectives of metrology?
- 2 Explain the term accuracy.
- 3 List any four linear measuring instruments.
- 4 What are the limitations of sine bar?
- 5 What do you mean by straightness?
- 6 Name various methods surface inspection by comparison method.
- 7 What are the adverse effect of poor surface finish?
- 8 What are the types of CMM?

PART-B

(5 x 3 = 15 Marks)

Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.

(ii) All questions carry equal marks.

- 9 Name the various method of measurement and explain any one of them.
- 10 Draw a neat sketch of Vernier depth gauge and mark salient parts on it.
- 11 Distinguish between comparator and a measuring Instrument.
- 12 What are the Progressive pitch errors in screw threads?
- 13 Explain roundness measurement.
- 14 Classify-surface texture.
- 15 List any three uses of numerical control for measurement.
- 16 Write the procedure to calibrate Vernier caliper.

PART-C

(5 x 10 = 50 Marks)

Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question. (ii) All questions carry equal marks.

- 17 A Explain the principles of Mechanical Measuring Instruments. 10
(OR)
B Describe the following types of errors and state how they can be taken care of 10
i. Controllable errors ii. Random errors
- 18 A With the help of a neat sketch explain the construction, working and applications of 10
tool makers microscope.
(OR)
B Explain construction and uses of vernier bevel protractor and optical bevel protractor. 10
- 19 A Explain the working of Gleason gear testing machine. 10
(OR)
B Describe the following methods of measuring the effective diameter of screw threads. 10
i. Thread micrometer method ii. One wire method
- 20 A With a neat sketch explain how i. Tom Linson surface tester and ii. Talysurf meter is 10
used to measure roughness.
(OR)
B i. Draw the surface roughness symbol and explain. 5
ii. Describe any one method of numerical evaluation of surface texture with neat 5
sketch.
- 21 A Explain with neat sketch the construction and working of Laser Interferometer. 10
(OR)
B Explain the calibration of Vernier height gauge, Vernier depth gauge and Micrometer. 10

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October/November 2019 Examinations
DIPLOMA IN PRODUCTION ENGINEERING

Tool Design

Year/Sem: III / V (ODD-III)

Max. Marks : 75

Time : 3 hr.

PART-A

(5 x 2 = 10 Marks)

Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.

(ii) All questions carry equal marks.

- 1 Mention the types of chip formation.
- 2 Define the term cutting feed.
- 3 What is a reamer?
- 4 Define the term die clearance in blanking die.
- 5 What is spring back?
- 6 What is drawing operation?
- 7 What is jig feet?
- 8 Name the materials suitable for deep drawing dies.

PART-B

(5 x 3 = 15 Marks)

Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.

(ii) All questions carry equal marks.

- 9 Compare orthogonal and Oblique cutting.
- 10 What is the purpose of giving relief angle in milling cutter?
- 11 Mention the types of taps.
- 12 What are the factors influence the strip layout ?
- 13 Write a note on piercing.
- 14 Draw a simple sketch of embossing die.
- 15 Compare jig and fixtures.
- 16 What is the purpose of mandrel in grinding fixture?

PART-C

(5 x 10 = 50 Marks)

Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question. (ii) All questions carry equal marks.

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|----|---|---|----|
| 17 | A | Explain Merchant's theory of mechanics of metal cutting. | 10 |
| | | (OR) | |
| | B | i. Describe about the force analysis of milling cutter. | 5 |
| | | ii. Write the ISO designation of cutting tools. | 5 |
| 18 | A | Explain the nomenclature of Twist drill. | 10 |
| | | (OR) | |
| | B | Explain the constructional detail of a broach with neat sketch. | 10 |
| 19 | A | Find the total pressure, dimensions of tools to produce a washer 50 mm outside diameter with a 24 mm diameter hole, from material 4 mm thick, having a shear strength of 360N / mm ² . | 10 |
| | | (OR) | |
| | B | i. Explain Bend radius in design of bending dies. | 5 |
| | | ii. Explain Bend allowances in design of bending dies. | 5 |
| 20 | A | Explain any two design consideration of drawing dies. | 10 |
| | | (OR) | |
| | B | i. Explain the principle of curling die with simple sketch. | 5 |
| | | ii. Explain the operation in coining die with simple sketch. | 5 |
| 21 | A | Explain the construction of indexing jig with sketch. | 10 |
| | | (OR) | |
| | B | With an example explain a welding fixture. | 10 |

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October/November 2019 Examinations

DIPLOMA IN PRODUCTION ENGINEERING

Metal Forming Processes

Year/Sem: III / V (ODD-III)

Max. Marks : 75

Time : 3 hr.

PART-A

(5 x 2 = 10 Marks)

Note: (i) Answer any FIVE questions out of which question No.8 is compulsory.

(ii) All questions carry equal marks.

- 1 What is Stress?
- 2 Define the term Stress Deviator.
- 3 Write short notes on Flow Stress.
- 4 What are the merits of Strain Rate?
- 5 Classify the various Forging Operations.
- 6 List any three defects in Rolling Process, how it can be rectified?
- 7 Write any two merits of Port-Hole Extrusion Die.
- 8 What are the basic concepts of Blanking?

PART-B

(5 x 3 = 15 Marks)

Note: (i) Answer any FIVE questions out of which question No. 16 is compulsory.

(ii) All questions carry equal marks.

- 9 Explain the salient features of Principal Stress.
- 10 Describe the main purpose of Strain Rate.
- 11 Explain the importance of workability.
- 12 Differentiate between Open and Closed Die Forging .
- 13 Draw about Hydrostatic Extrusion Process.
- 14 State the important defects in Extrusion Process.
- 15 What is Explosive Forming?
- 16 Derive the working principles of Electro Magnetic Forming.

PART-C

(5 x 10 = 50 Marks)

Note: (i) Answer all the questions choosing either sub-division (A) or sub-division (B) of each question. (ii) All questions carry equal marks.

- | | | | |
|----|---|--|----|
| 17 | A | Enumerate the key principles involved in the Von-Mises and Tresca yield criterion. | 10 |
| | | (OR) | |
| | B | Make a detailed discussions of | |
| | | i. Shear Stress | 5 |
| | | ii. Shear Strain | 5 |
| 18 | A | Explain the relationship between Friction and Lubrication with suitable examples. | 10 |
| | | (OR) | |
| | B | Describe the objectives of | 5 |
| | | i. Workability | 5 |
| | | ii. Residual Stresses | |
| 19 | A | With neat sketch explain about the various types of Presses and Hammers. | 10 |
| | | (OR) | |
| | B | What are the key problems involved in | 5 |
| | | i. Rolling Defect | 5 |
| | | ii. Causes and Remedies | |
| 20 | A | Give the detailed explanation of Direct and Indirect Extrusion Process with neat sketch. | 10 |
| | | (OR) | |
| | B | Write a detailed notes on | 5 |
| | | i. Seamless Pipe | 5 |
| | | ii. Drawing of Rods | |
| 21 | A | With suitable illustrations, discuss | 5 |
| | | i. Stretch Forming | 5 |
| | | ii. Bending | |
| | | (OR) | |
| | B | What is meant by Electro Hydraulic Forming? Explain the working principles with neat sketch. | 10 |
