Code: 15O-4305 **PRODN**

THIAGARAJAR POLYTECHNIC COLLEGE, SALEM

(Autonomous) **Reg. No.** [ ]

October/November 2018 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 Polymer?
2 What are the different operations done on a Slotter?
3 What is Broaching?
4 List out the types of milling cutters.
5 State any two factors considered in selection of grinding wheel.
6 What is Plasma?
7 What is Part Program?
8 What is in-process probing?

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 List out three merits of composite materials.
10 Illustrate with a sketch the principle of operation of a Shaper.
11 Find out the Index Crank Movement for milling 14 equal divisions.
12 Distinguish between Gear Shaping and Gear Hobbing.
13 List out three aspects taken into account while mounting a grinding wheel.
14 State three applications of Laser Machining.
15 Compare NC and CNC.
16 Explain continuous broaching 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 divisions carry equal marks.

17 A (i) What are the special properties of plastics? 5
(ii) Mention the characteristics of composite material. 5

(OR)

B Describe Glass Fibre manufacture with sketch. 10

18 A With simple sketch, describe the electric drive quick return mechanism used for planer table. 10

(OR)

B (i) Enumerate the various advantages of hydraulic drive employed in shaping machine. 5
(ii) Describe the nomenclature of a pull broach with sketch. 5

19 A With the aid of neat sketches, describe the following operations. 10
(i) Straddle Milling (ii) Gang Milling.

(OR)

B Write short notes on, 10
(i) Stub Arbor (ii) Differential Indexing (iii) Gear Grinding.

20 A Describe the working of Internal Centre less Grinder with neat sketch. 10

(OR)

B (i) Explain Electro Chemical Grinding with neat sketch. 5
(ii) Enumerate the applications, advantages, and limitations of Electric Discharge Machining. 5

21 A (i) Explain the working principle of CNC system with a line diagram 5
(ii) Explain with sketch the working of bridge type CMM. 5

(OR)

B (i) Explain Rotary Encoder. 5
(ii) Explain the Re-circulating Ball Screw and Nut type of slide ways with sketch. 5

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DIPLOMA IN PRODUCTION ENGINEERING

Engineering Metrology

Year/Sem: III / V (ODD-III) Max. Marks : 75 Time : 3 hrs.

PART-A **(5 x 2 = 10 Marks)**

Note: (i) Answer any FIVE questions out of which question No.8is compulsory.
(ii) All questions carry equal marks.

1 What is the necessity of metrology?
2 What is the relationship between sensitivity and range?
3 Write any four angular measuring instruments.
4 What is sine bar?
5 What is flatness?
6 What is surface texture?
7 Define calibration.
8 List out 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 Write any three objectives of metrology.
10 Explain about source of errors.
11 What is interferometry?
12 Write note on thread gauge.
13 Explain about three wire method.
14 Write the effects of poor surface.
15 List out three uses of universal measuring machine.
16 Explain about tool maker's microscope.

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 divisions carry equal marks.

17	A		Explain the types of metrology.	10
			(OR)	
	B	(i)	Explain the systematic and random errors.	5
		(ii)	Explain the selection and care of instruments.	5
18	A		Explain the working of vernier height gauge with neat sketch.	10
			(OR)	
	B	(i)	Explain about any one type of vernier caliper.	5
		(ii)	Explain about slip gauges.	5
19	A		Explain about the screw thread terminology.	10
			(OR)	
	B	(i)	Explain floating carriage micrometer.	5
		(ii)	Explain flatness and roundness measurement.	5
20	A		Describe any one method of measuring surface finish.	10
			(OR)	
	B	(i)	Explain about surface texture with neat sketches.	5
		(ii)	Describe the adverse effects of poor surface finish.	5
21	A		Explain the construction of a CMM with neat sketch.	10
			(OR)	
	B	(i)	Explain the calibration of vernier caliper.	5
		(ii)	Explain working of LASER interferometer.	5

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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 What is chip breaker?
2 What is the purpose of providing radial rake angle in plain milling cutter?
3 Define perforating.
4 What is deep drawing?
5 Define Jig.
6 Name any four types of reamer.
7 What is the point angle of a twist drill?
8 List the use of drill bushing.

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 Write the composition of 18-4-1 HSS tool.
10 Draw any one type of broach tool.
11 Explain the bending allowance.
12 Explain the bulging dies.
13 Write any two design aspects of welding fixture.
14 Write the importance of helix angle provided in a milling cutter.
15 Explain Bending terminology.
16 How you will calculate the blank diameter for drawing operation?

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 divisions carry equal marks.

17 A Design a plain milling cutter for the following conditions: 10
Machine tool : 10hp Horizontal milling machine;
Work piece size : 150 mm x 100 mm x 50 mm;
Work piece material : Mild Steel; Cutting speed : 60 m/min;
Depth of cut : 5mm.

(OR)

B i) Explain about chip formation. 5
ii) Compare orthogonal cutting and oblique cutting. 5

18 A Design a taper shank twist drill to machine a hole in cast iron gear housing. The hole is 25mm in diameter, 20mm deep and is a through hole. 10

(OR)

B i) Illustrate the nomenclature of a tap. 5
ii) Explain any three design features of broach tool. 5

19 A Explain the design principles of a bending die. 10

(OR)

B i) Explain the principle of metal cutting. 5
ii) Explain a simple blanking die with neat sketch. 5

20 A A cup 50 mm diameter and 75 mm deep is to be drawn from 2.5mm thick drawing steel with a tensile strength of 315N/mm^2. The corner radius is negligible. Determine a)blank diameter; b)number of draw; c)force and energy for the first draw with 40% reduction. 10

(OR)

B i) Explain the twisting operation performed by a forming die. 5
ii) Explain the importance of swaging die. 5

21 A Explain the six point location principle with the help of suitable sketches. 10

(OR)

B i) Explain any one type of milling fixture with sketch. 5
ii) Explain any two types of clamps with sketch. 5

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October/November 2018 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 are the components of stress?
2 List out the advantages of cold working process.
3 What do you mean by residual stress?
4 What is the difference between forging press and forging hammer?
5 What is the purpose of gutter in a forging die?
6 What are the fluids used in hydrostatic extension process?
7 List out the explosives used in explosive forming.
8 What are HERF and HVF?

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 What do you mean by principal stresses?
10 List out the effect of friction in metal forming.
11 State the importance of lubrication in metal forming.
12 What is arc of contact and angle of bite?
13 List out the methods of tube drawing.
14 Explain deep drawing with neat sketch.
15 Explain blanking operation with neat sketch.
16 Explain Hydrostatic extrusion with neat sketch.

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 divisions carry equal marks.

17 A What are the factors affecting metal forming? How do the forming load calculations are generally arrived? 10

(OR)

B Explain the following :
(i) State of stress 5
(ii) Octahedral shear stress. 5

18 A Explain the Flow stress deformation. 10

(OR)

B Explain the effect of temperature strain rate and metallurgical structure on metal working. 10

19 A Explain forging defects, causes and their remedies. 10

(OR)

B Explain sendzimir mill and planetary rolling mill with neat sketches. 10

20 A Explain forward extrusion both for solid and hollow products with neat sketches. 10

(OR)

B Explain wire and rod drawing process with neat sketch. 10

21 A Explain the types of dies used in press working with sketches. 10

(OR)

B (i) Explain dynapak with neat sketch. 5
(ii) Explain petro forge forming with neat sketch. 5

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