Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**PDDC - SEMESTER–VII EXAMINATION – WINTER 2015**

**Subject Code: X71902** **Date:11/12/2015**

**Subject Name: Production Technology**

**Time: 10:30pm to 1:00pm** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Describe electrical discharge machining (EDM) stating its advantages, limitation and application. | **07** |
| | **(b)** | Enlist various types of locating devices used for Jigs and Fixture and explain any three with neat sketch. | **07** |
| **Q.2** | **(a)** | Describe the methods of reducing cutting forces in press working. | **07** |
| | **(b)** | Classify different presses and describe any one of it with neat sketch. | **07** |
| | | **OR** | |
| | **(b)** | Explain Shearing, Drawing, Bending, stretch forming, Spinning and Hydro-forming operations with neat sketches. | **07** |
| **Q.3** | **(a)** | What is tool signature? Define various tool angles with neat sketch and discuss their effect on machining. | **07** |
| | **(b)** | The data observed during orthogonal cutting are: Depth of cut = 0.3 mm, Chip thickness = 0.6 mm, Rake angle = $20^o$, Cutting velocity = 102 m/min, Cutting force = 300 N and Feed force = 120 N. Determine Shear angle, Shear strain, Velocity of chip along tool face and Work done in shear. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | 1. Derive velocity relationship in orthogonal cutting. | **04** |
| | | 2. Define shear zone, shear plane and shear angle for metal cutting. | **03** |
| | **(b)** | For turning operation, tool life is given by $\mathbf{VT^{0.14} \times f^{0.78} \times d^{0.38} = C}$. One hour tool life was obtained while cutting at V=28 m/min, f=0.3 mm/rev and d=2.6 mm. Calculate the tool life if the cutting speed, feed and depth of cut are increased by 25 percent individually and also taken together. | **07** |
| **Q.4** | **(a)** | Explain principle of Laser Beam Machining (LBM) with neat sketch stating its advantages and application. | **07** |
| | **(b)** | Explain Hinged Clamp, Quick Action Nut and Hydraulic Clamp with neat sketches. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Describe the degrees of freedom for workpiece located in space. Explain 3-2-1 locating principle with neat sketch. | **07** |
| | **(b)** | Explain process principle of Ion Beam Machining (IBM). Also discuss major process parameters affecting machining. | **07** |
| **Q.5** | **(a)** | What are different methods for mass production of spur gear? Explain any one in detail. | **07** |
| | **(b)** | Discuss the various types of multi spindle automates. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Discuss (i) Chasing (ii) Rolling (iii) Tapping thread manufacturing methods with neat sketches. | **07** |
| | **(b)** | Explain Controls in CNC Machine tools. | **07** |