(3 Hours) **[Total Marks : 80]**

N.B. **(1)** Question no. **1** is **compulsory.**
(2) Attempt any **three** questions out of remaining **five** questions.
(3) Illustrate your answer with **necessary** sketch wherever **necessary**.
(4) Figures to the **right** indicate full **marks**.
(5) Assume suitable data wherever **necessary**.

1. **Attempt any FOUR of the following :** **(20)**

(a) How does Additive Manufacturing differ from CNC machining?

(b) What is the difference between traditional and non-traditional machining processes?

(c) What is meant by grit, grade and structure of a grinding wheel?

(d) Differentiate between a compound die and combination die.

(e) What is meant by chip thickness ratio? What does it depend on? Draw a neat labelled sketch to show various angles and velocities related to chip thickness ratio.

2. **(a)** What are the factors determining the material removal rate in Electric Discharge Machining Process. Elaborate on them. **(10)**

(b) Differentiate between Orthogonal and Oblique cutting. **(10)**

3. **(a)** Differentiate between blanking and punching process with a neat labelled sketch. **(10)**

(b) What is meant by locating, Clamping and resting w.r.t. Jigs and Fixtures. **(10)**

4. **(a)** What is meant by a cutting tool signature? How do you express it in ORS and NRS system. Draw a neat labelled sketch to show it in the two systems along with the nomenclature. **(10)**

(b) Describe the process of photo-polymerization with a neat labelled sketch. **(10)**

5. **(a)** What are the parameters governing Photo-polymerization process? **(10)**

(b) What is meant by Tool Life Equation? How is it useful? **(10)**

6. Write short notes on: **(20)**

(a) Geometry of a broach.

(b) Laser Beam Machining

(c) Types of dynamometers used in machine tools.

(d) Use of locators in designing jigs and fixtures.

(e) Requirements of a Milling Fixture.
