Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.TECH(ME)/SEM-2/PTM-202/2010

2010

NON-TRADITIONAL MACHINING PROCESSES

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *five* questions. 5 × 14 = 70

1. What do you mean by non-traditional machining processes ? State its advantages over traditional machining processes. Explain the mechanics of Abrasive Jet Machining (AJM). 4 + 4 + 6

2. Discuss briefly about ultrasonic machining process (USM). Is USM really a chipless process ? What is Rotary Ultrasonic Machining ? 9 + 3 + 2

3. State the principle of operation of Electro-chemical Machining (ECM). In what factors does the M.R.R. depend on ECM ? State the applications of ECM. 8 + 4 + 2

4. Discuss briefly about the principle of operation of Electrical Discharge Machining (EDM) with neat sketch. State the design considerations for EDM. 10 + 4

5. Discuss briefly about Laser Beam Machining (LBM). State the process capabilities. 10 + 4

6. Explain the difference between chemical machining and electrochemical machining. What is the underlying principle of electrochemical grinding ? What is undercut and why must it be considered in chemical machining ? 5 + 5 + 4

7. Illustrate Electron Beam Machining (EBM) with schematic view. For cutting a 150 μm wide slot in a 1 mm thick tungsten sheet, an electron beam with 5 kW power is used. Determine the speed of cutting.

   [Take specific power consumption in EBM for tungsten (c) = 12 W/mm ^{3} /min]. 10 + 4

8. Write short notes on Electrochemical discharge machining, Nano fabrication, Micro-machining. 5 + 5 + 4