

**J.C. BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY YMCA, FARIDABAD**  
**B. TECH. 4<sup>TH</sup> SEMESTER MECHANICAL ENGINEERING (UNDER CBS)**  
**MANUFACTURING SCIENCE-II (MU-212)**

Time: 3 Hours

Max. Marks: 60

- Note:**
1. It is compulsory to answer the questions of Part -1.
  2. Answer any four questions from Part -2 in detail.
  3. Different parts of the same question are to be attempted adjacent to each other.
  4. Support your answer with neat sketches, wherever necessary.

**PART -1**

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| Q1 | (a) What is the most generally used method for measuring average chip-tool interface temperature? (2) |
|    | (b) What are the disadvantages of ceramics as cutting tool materials? (2)                             |
|    | (c) What are the main applications of cutting fluids? (2)   |
|    | (d) What is meant by machinability? (2)   |
|    | (e) What is gear burnishing? (2)  |
|    | (f) What are the characteristics required for a good electrode material in EDM? (2)                   |
|    | (g) What are the different types of clamps used in jigs and fixtures? (2)                             |
|    | (h) What are the typical electrode materials used in tungsten inert gas welding? (2)                  |
|    | (i) Why is foolproofing done in fixtures? (2)   |
|    | (j) Define the terms 'tolerance' and 'limits' with reference to the dimensional measurement. (2)      |

**PART -2**

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| Q2 | What is meant by built-up-edge (BUE)? With a neat sketch, explain the formation of a BUE. Explain the conditions which promote the growth of BUE along with its consequences. (10) |
| Q3 | (a) Explain the basis for the selection of a specific cutting fluid for a given application. (6)   |
|    | (b) What are the desirable characteristics of a cutting tool material? (4)   |
| Q4 | (a) Compare gear shaping and gear hobbing giving the process and product requirements. (6)   |
|    | (b) Define tool life? Discuss the various factors which govern the tool life. (4)  |
| Q5 | Discuss the working principle, process parameters and advantages of Ultrasonic Machining (USM). (10)   |
| Q6 | (a) Discuss the different parts of a milling fixture. (6)  |
|    | (b) What are the differences in the vernier and micrometer as used for linear measurements? (4)  |
| Q7 | (a) Explain the process of diffusion welding. (6)  |
|    | (b) Is it possible to use a centre lathe for friction welding? Support your answer with reasons. (4)   |

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