

B. PRODUCTION ENGG. EXAMINATION, 2017
(4th Year, 1st Semester)
NON-TRADITIONAL MACHINING

Full Marks: 100

Time: Three Hours

Answer any five Questions

1. (a) Classify NTM processes on the basis of type of energy employed and mechanism of material removal. 10
- (b) Explain the main process parameters and applications for material machining of the following processes:
 - (i) Laser Beam Machining,
 - (ii) Electron Beam Machining,
 - (iii) Plasma Arc Machining, 10
2. (a) Explain in brief the basic scheme of Electrochemical Machining Process. 5
- (b) Describe various voltage drops across the gap between tool and workpiece in ECM. 5
- (c) Describe dynamics of ECM process and show variation of inter electrode gap with time for zero feed rate , constant feed rate and inclined tool feeding. 10
3. (a) Explain the function of Electrolyte and Dielectric in ECM and EDM respectively. Describe flow path design of Electrolyte and Dielectric in ECM and EDM. 8
- (b) What is Wire cut EDM? Describe about WEDM. What dielectric is used for WEDM and why? Identify the major advantages of this machining process. 12

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B. PRODUCTION ENGG. SUPPLEMENTARY EXAMINATION, 2017

(4th Year, 1st Semester)

NON-TRADITIONAL MACHINING

Full Marks:100

Time: Three Hours

4. a) State the components and their function of Tool Vibration unit of USM system.
b) What are the applications of USM? How do you specify a USM machine?
c) Explain the effects of process parameters on machining performance of USM.
(6+6+8)
5. a) Write the applications of different types of abrasives used in AJM.
b) Discuss on the working principle of Abrasive Jet Machining System with Sketch.
c) Distinguish between AJM and WJM process.
d) Draw the construction of abrasive water jet nozzle and mention its functions.
(4+8+4+4)
6. a) Discuss on the effect of process parameters on material removal rate in AWJM.
b) Discuss on applications of Abrasive Water Jet Machining (AWJM) Process.
c) What are the advantages of Abrasive Water Jet Machining (AWJM) over Water Jet Machining (WJM).
d) What are the types and basic function of the catcher in Water Jet Machining?
(8+4+4+4)
7. a) Why vacuum is needed in Electron Beam Machining Chamber?
b) Discuss the material removal mechanism of Electrochemical Grinding (ECG) process with sketch.
c) Discuss the working principle of Electrochemical Discharge Machining (ECDM) process with sketch.
(4+8+8)
8. a) What are the differences between Plasma Arc Cutting and Laser Cutting?
b) Distinguish between transferred and non-transferred plasma arc machining system with sketches.
c) What is the fundamental principle of laser generation? Explain with sketch.
d) Discuss on the Nd:YAG or CO₂ Laser beam machining system with sketch.
(3+4+5+8)
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