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Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(PE) (Sem.–2)

NON CONVENTIONAL MACHINING PROCESSES

Subject Code : PE-507

Paper ID : [E0446]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

Q1 a) Distinguish between traditional and non-conventional machining processes giving appropriate examples. Provide a sketch showing classification of non-conventional machining processes.

b) With the neat sketch discuss the working principle of main components of an abrasive jet machining process.

Q2 a) Discuss the principle and operation of Whirling jet machining giving a neat sketch.

b) Describe the working principle and instrumentation deployed in Ultrasonic machining system with the help of a neat sketch.

Q3 Explain the principle and operation of electro-chemical machining process using neat sketch. Describe various properties required for an electrolyte in Electro chemical machining. And also explain the tool design aspects in Electro chemical machining.

Q4 a) With reference to Ultrasonic machining Explain :

i) Transducers used in USM machine.

ii) Effect of amplitude of vibration, frequency of vibration and grain size.

iii) Function of slurry, horn, and oscillator.

iv) Types of abrasives used in USM.

b) Explain the principle and operation of chemical machining using sketches. List out the advantages and applications of chemical machining.

Q5 a) Explain the working of electric discharge machining process giving a neat sketch. Also explain the mechanism of material removal in Electric discharge machining.

b) Discuss the advantages of EDM as compared to other non-traditional methods with regard to (i) metal removed rate (ii) accuracy and (iii) surface finish.

Q6 a) Glass is being machined using USM at a MRR of 6 mm^3/min by AI_2O_3 abrasive grits having a grit dia of 150 μm. If 100 μm grits were used, what would be the MRR?

b) Explain the working of electron beam machining giving details of electron beam gun and diffusion pump.

Q7 Distinguish between spontaneous emissions and stimulated emissions. What is solid state laser? Explain the construction and working of a solid state laser giving a neat sketch.

Q8 a) Compare the edge production in EBM and LBM. What are the factors influencing edge maintenance in both the processes? State few applications of both.

b) Explain the working of explosive forming process giving a neat sketch.