

Code No: 117JH

**R13****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year I Semester Examinations, November/December - 2016****UNCONVENTIONAL MACHINING PROCESSES****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

**Part- A****(25 Marks)**

- 1.a) What are the various types of energy sources used in non-traditional machining techniques? Give examples for each. [2]
- b) Differentiate the conventional and unconventional machining processes in terms of principles. [3]
- c) Why is AJM not suitable for UCM processes. [2]
- d) Why WJM is not suitable for brittle materials? Explain. [3]
- e) Name some of the tool material used in EDM? [2]
- f) What are the dielectric fluids commonly used in EDM process? [3]
- g) Explain the principle of Laser beam? [2]
- h) Distinguish between thermal and Non-thermal process in EBM process? [3]
- i) Generalize techniques of applying maskant? [2]
- j) What are the criteria used for selection of etchant? [3]

**Part-B****(50 Marks)**

- 2.a) What are the main parameters to be considered while selecting a particular process? Why? [5+5]
- b) Explain the factors, which influence the metal removal rate in USM. Explain briefly. [5+5]

**OR**

- 3.a) What are the basic requirements of tool feed mechanism in USM process? Explain. [5+5]
- b) Explain the various applications of Non-traditional machining process in detail. [5+5]
- 4.a) State and explain the working principle of Abrasive Jet Machining in detail. [5+5]
- b) Briefly explain the various process parameters that affect the material removal rate and surface quality in ECM. [5+5]

**OR**

- 5.a) Explain the different variables that influences the rate of metal removal and accuracy in Abrasive Jet Machining? [5+5]
- b) What is the principle of WJM? Describe the working of a WJM system with a neat sketch. [5+5]
- 6.a) Define Dielectric? Write a note on it indicating its functions and characteristics? [5+5]
- b) Explain the process of wire cut EDM and list any two of its advantages, limitations and applications. [5+5]

**OR**

- 7.a) What are the desirable properties of a dielectric fluid? Give some examples for dielectric fluids. Explain the functions of dielectric fluid.
- b) What are the important process parameters that control the material removal rate in EDM? Explain any four factors. [5+5]
- 8.a) Explain the various process parameters which influence in Metal removal Rate in EBM process?
- b) Make a comparison between LBM and EBM processes on the basis of their working, control of beam, applications and limitations. [5+5]
- 9.a) Enumerate the advantages, limitations and applications of Laser Beam Machining?
- b) Describe, with the help of neat sketch, the principle and working of an EBM machine. [5+5]
- 10.a) Describe the Process parameters of PAM and influence on machining quality? Explain
- b) Describe the quality of machining and accuracies obtainable in chemical machining? [5+5]

OR

- 11.a) With neat diagram explain the principle of plasma arc machining. State its advantages, limitations and application.
- b) Discuss the criteria's that are applied in the selection of etchant and maskants? [5+5]

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