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?
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.
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.
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?
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?
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? Gives 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? any four factors. [5+5]

8.a) Explain the various process parameters which influence in Metal removal Rate in process?
b) Make a comparison between LBM and EBM processes on the basis of their working, control of beam, applications and limitations. [5+5]

OR

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, limitatio and application.
b) Discuss the criteria's that are applied in the selection of etchant and maskants? [5+5]

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