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Code No: 127JH **R15**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, November/December - 2018
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 do you understand by chip less machining and write its advantages? [2]
b) What do you understand by unconventional machining? [3]
c) State the applications and limitations of electro chemical honing. [2]
d) Differentiate the electro chemical machining process and electro chemical grinding. [3]
e) Write the advantages and limitations of Electro chemical machining process over EDM. [2]
f) What are the functions of spark generator in EDM? [3]
g) What are the process capabilities of laser beam machining process. [2]
h) Compare the thermal and nonthermal processes. [3]
i) What are the main functions of electrolyte in chemical machining? [2]
j) Classify different types of plasma arc systems? Explain any one in detail. [3]

PART-B

(50 Marks)

2.a) Explain the characteristic features of modern machining processes that distinguish them from conventional machining processes.
b) Classify different types of unconventional machining processes. State its applications. [5+5]

OR

3.a) Explain in detail how the material removal rate in ultrasonic machining varies with process parameters?
b) Explain the basic mechanism of material removal in ultrasonic machining process? State its advantages? [5+5]

4.a) Differentiate between the principles of water jet machining and abrasive water jet Machining?
b) Explain the principle of working, applications and advantages abrasive water jet machining. [5+5]

OR

5.a) Explain in detail the working of electro chemical grinding process with a suitable sketch?
b) In an ECM process for machining iron it is desired to obtain a meal removal rate of 1 cm^3/min. Determine the amount of current required for the process, assuming the atomic weight of iron is 56 gm, valency at which dissolution occurs is 2, density of iron is 7.8 gm/cm^3 and faradays constant is 1609 amp-min. [5+5]

6.a) List out the commonly used tool materials in EDM process and Discuss the factors influencing the choice of electrode material.

b) Explain the effect of die-electric fluids on surface finish in EDM Process. [5+5]

OR

7.a) Explain in detail the considerations involved in selection of die electric fluids in EDM.

b) With the help of a schematic diagram represent different electric generators in EDM process. [5+5]

8.a) List out the process parameters of laser beam machining and explain their influence on metal removal rate.

b) Discuss how the direction and intensity of electron beam is controlled in Electron beam machining process. [5+5]

OR

9.a) Write the advantages and applications of laser beam machining process.

b) What are the various Lasers used in practice for machining and explain the requirements of lasers? [5+5]

10.a) Explain in detail the various process parameters of plasma arc machining and explain its influence on metal removal rate.

b) What are the industrial applications of plasma arc machining process? [5+5]

OR

11. Discuss in detail about, the accuracy and surface finish obtained in plasma arc machining. [10]

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