

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2529 Roll No.

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B.Tech.

(SEM. VI) THEORY EXAMINATION 2010-11

UNCONVENTIONAL MANUFACTURING PROCESSES

Time : 3 Hours

Total Marks : 100

Note : (i) Attempt all questions.

(ii) Be precise in your answer.

1. Attempt any two of the following : (10×2=20)

- (a) Compare conventional and unconventional manufacturing methods based on their manufacturing capabilities. What are the major advantages and limitations of unconventional manufacturing processes ?
- (b) Classify unconventional machining processes using various parameters. In each case, indicate the energy transfer mechanism.
- (c) Describe the important factors required for the selection of a unconventional machining process.

2. Attempt any four of the following : (5×4=20)

- (a) Draw a neat schematic diagram and explain the working of electrochemical machining.
- (b) Discuss the factors that affect material removal rate in ECM.

- (c) Briefly discuss the mechanism of metal cutting in ultrasonic machining.
- (d) Explain the effect of abrasive particle size, frequency of tool vibration and hardness of work piece on ultrasonic machining process.
- (e) What is standoff distance in abrasive jet machining ? Discuss its relationship with shape of machined cavity.
- (f) With neat sketches explain various electrolyte flushing techniques in electro-discharge machining.

3. Attempt any two of the following : (10×2=20)

- (a) Show the schematic diagram of a hole drilled by laser beam machining and explain the drilling operation. What are the factors that affect the quality of drilled hole ?
- (b) Discuss the process capabilities of electron beam welding. What is thermal and non-thermal type processes ? Can you machine electrically non-conducting materials using EBM process ?
- (c) Write a short note on transducer used in USM machine. What are the functions of slurry, horn and oscillator ?

4. Attempt any two of the following: (10×2=20)

- (a) Explain explosive welding with a schematic diagram of the process. What are the main safety concerns related with these processes ?
- (b) Describe the principle of wet underwater welding. What precautions are necessary to ensure personnel safety and good quality of weld in the process ?

- (c) With neat sketches explain the air plasma torch, dual gas torch and water injected plasma torch. Discuss some of its performance parameters.
5. Attempt any two of the following : (10×2=20)
- (a) With a schematic diagram explain the electromagnetic forming process and list its salient features.
- (b) What are the limitations of the high velocity forming? What is explosive compaction and what are its applications?
- (c) Describe photolithography process. What are its applications? Enumerate the steps in the photolithography process.