

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

Paper ID : 140652

Roll No.

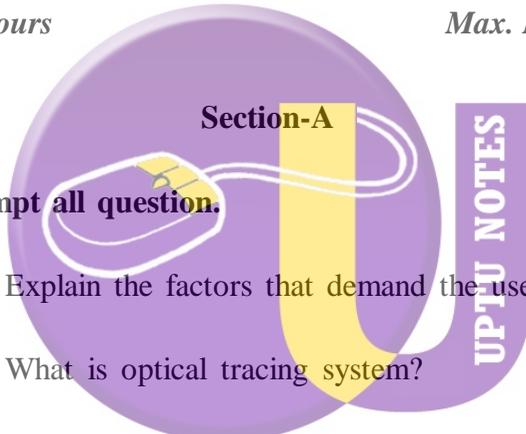
B.TECH.

Theory Examination (Semester-VI) 2015-16

UNCONVENTIONAL MANUFACTURING PROCESSES

Time : 3 Hours

Max. Marks : 100



Q1. Attempt all question.

(10×2=20)

- (a) Explain the factors that demand the use of AMP.
- (b) What is optical tracing system?
- (c) What are the basic limitations of UMP?
- (d) What the dielectric fluids commonly used in EDM?
- (e) What are the design factors to be considered while selecting the machine tool?
- (f) By what process stainless steel gets welded to cast iron.

- (g) What are different types of concentrators?
- (h) What are the characteristics of Laser used in Laser machining?
- (i) How current density affect material removal rate in ECM?
- (j) List five conventional and five related unconventional manufacturing process.

Section-B

2. **Attempt any five parts of the following. (10×5=50)**

- (a) What is non transferred and transferred model of plasma arc? Explain mechanism of material removal in PAM.
- (b) Why unconventional mechanical machining process is not so effective on soft metal like aluminum, provide proper explanation for your reason.
- (c) What do you understand by Cladding? How it is done? Explain in detail.
- (d) Describe the wire cut EDM equipment, its working applications and advantages.

- (e) With neat sketches explain the air plasma torch, dual gas torch and water injected plasma torch. Discuss some of its performance parameters.
- (f) Write short notes on : (i) Water hammer forming (ii) Explosive compaction
- (g) Compare and contrast the various unconventional machining process on the basis of type of energy employed, material removal rate, transfer media and economical aspects.
- (h) Describe photolithography process. What are its applications? Enumerate the steps in the photolithography process.

Section-C

Note: Attempt any two parts of the following. (15×2=30)

3. Derive an equation for the maximum permissible feed rate of the cathode tool and hence deduce the relation for the electrolytic temperature change for a given feed rate of the cathode tool.
4. Describe the explosive forming process. What will happen if no liquid medium is used? State some of the application of it.

5. Estimate the material removal rate in AJM of a brittle material with flow strength of 4 GPa. The abrasive flow rate is 2 gm/min , velocity is 200m/s and density of the abrasive is 3 gm/cc. Also calculate material removal per impact if mass flow rate of abrasive is 3 gm/min, density is 3 gm/cc and grit size is $60\mu\text{m}$ as well as indentation radius.

