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

PAPER ID : 2529 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VI) THEORY EXAMINATION 2011-12

UNCONVENTIONAL MANUFACTURING PROCESSES

Time : 3 Hours *Total Marks : 100*

Note :—(1) Attempt **all** questions.

(2) All questions carry equal marks.

(3) Be precise in your answers.

(4) Assume suitable data if necessary.

1. Attempt any **four** of the following :— **(5×4=20)**

(a) Justify the need of unconventional manufacturing process in today's industries.

(b) Distinguish between conventional and unconventional manufacturing processes.

(c) Why the unconventional manufacturing processes are not completely taking over the conventional manufacturing processes ? Explain.

(d) Classify unconventional machining processes, giving type of energy, mechanism of metal removal, transfer media and energy source.

(e) What are the physical parameters that influence the selection of unconventional machining process ?

(f) Discuss the effect of frequency and amplitude of vibration on material removal rate in Ultrasonic Machining (USM) process.

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

(a) Explain the working principle of abrasive jet machining process with the help of suitable sketch showing all the elements.

(b) What is the principle of water jet machining ? Explain the nozzle assembly in water jet cutting with a suitable figure.

(c) In electrochemical machining of pure iron a material removal rate of 600 mm^3/min is required. Estimate current requirement.

(d) Explain the working principle of Electro Discharge Machining with a neat sketch.

(e) Glass is being machined by Ultrasonic Machining at a MRR of 6 mm^3/min by Al_2O_3 abrasive grits having a grit diameter of 150 μm. If 100 μm grits were used, what would be the MRR ?

(f) Briefly describe the following :

(i) Loading factor in water abrasive jet machining.

(ii) Dielectric fluid.

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

(a) Discuss the important elements of Electron Beam Machining (EBM) system. Briefly discuss the major applications of EBM.

(b) Describe basic principle, working and general applications of Laser Beam Machining (LBM) process.

(c) Explain the working principle of Plasma Arc Machining (PAM). Discuss the limitations of PAM.

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

(a) Describe the explosive welding process. Explain process variables in explosive welding.

(b) With the help of a neat sketch explain the principle of underwater welding process. What problems and hazards are associated with wet underwater welding process ? How is the stability of 'arc' achieved ?

(c) Explain the following :—

(i) Cladding

(ii) Metallizing process.

5. Attempt any **two** of the following :— **(10×2=20)**

(a) What is high energy rate forming process ? Mention some typical application of explosive forming using contact operation and standoff operation.

(b) Explain the working principle of electromagnetic forming with the help of a neat sketch.

(c) Explain the following :—

(i) Water hammer forming

(ii) Explosive compaction.