



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad-500043

MECHANICAL ENGINEERING

ASSIGNMENT QUESTIONS

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| Course Name | : | UNCONVENTIONAL MACHINING PROCESSES |
| Course Code | : | A70359 – R15 JNTUH |
| Class | : | IV B. Tech I Semester |
| Branch | : | MECHANICAL ENGINEERING |
| Year | : | 2018 – 2019 |
| Course Coordinator | : | Mr. S Srikrishnan, Assistant Professor ME |
| Course Faculty | : | Mr. S Srikrishnan, Assistant Professor ME |

COURSE OBJECTIVES:

The objective of this course is to impart knowledge on the various unconventional machining processes, the process parameters associated with them. Selection of an appropriate machining process for a particular application, properties of the work material and shape to be machined, process capability and economic considerations of these processes.

| S. No | QUESTION | Blooms Taxonomy level | Course Outcomes |
|---------------------|--|-----------------------|-----------------|
| ASSIGNMENT I | | | |
| 1 | Explain the reasons for the development of Unconventional Machining Process. | Understand | 1 |
| 2 | Discuss about the criteria recommended in selection of these processes. | Remember | 2 |
| 3 | List the unconventional machining process, which uses thermal or heat energy? | Understand | 3 |
| 4 | Make a comparison between traditional and unconventional machining processes in terms of cost, Application, scope, Machining time, advantages and limitations. | Remember | 4 |
| 5 | Briefly discuss about the mechanisms involved in material removal by USM. | Understand | 5 |
| 6 | Draw the schematic set-up of Ultrasonic Machine and indicate its various parts. | Remember | 6 |
| 7 | Discuss in detail about the methods of generating the ultrasonic, characteristics of the various types of tool holder and tool feed mechanisms in USM. | Understand | 5 |
| 8 | Define “Ultrasonic” and describe the process in which these are used to machine the material. | Remember | 5 |
| 5 | State the working principle of Abrasive Jet Machining with a neat sketch? | Understand | 4 |
| 6 | List the advantages of AJM process? | Remember | 9 |
| 7 | Explain the effect of following parameters on the metal removal rate in AJM. i) Velocity of fluid. ii) Design of nozzle. iii) Gas pressure. | Understand | 2 |
| 8 | Describe the operation of AJM in detail. | Remember | 1 |

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|----------------------|---|-----------------------|-----------------|
| 9 | State the function of electrolyte used in ECM process? | Understand | 2 |
| 10 | What are essential characteristics of an electrolyte used in ECM process? | Remember | 2 |
| 11 | Describe the working principle and elements of chemical machining. | Understand | 4 |
| 12 | What are the factors on which the selection of a resist for use in chemical machining? | Remember | 6 |
| 13 | Describe with a neat sketch the working of Wire EDM? | Understand | 4 |
| 14 | Explain the effect of following parameters in MRR during EDM. i) Resistance ii) Magnitude of current iii) Capacitance. | Remember | 6 |
| ASSIGNMENT II | | | |
| 1 | Explain the various Thermal metal removal process and differentiate between them. | Remember | 7 |
| 2 | Explain the principles, equipment, dielectric system, electrode, tools, process capabilities, applications and advantages of Electro Discharge Machining. | Understand | 7 |
| 3 | Explain the construction and working of Electron beam machining process with a neat sketch. | Remember | 8 |
| 4 | What is the need of doping of LASER and mention various doping materials and their relative advantages? | Understand | 9 |
| 5 | Explain the principle and elements of EBM, also how the work table is protected from getting damaged by electron beam. | Remember | 10 |
| 6 | What is laser? Explain how it is used to machine the materials. | Remember | 11 |
| 7 | Explain the working of PAM with a neat sketch. | Understand | 12 |
| 8 | Explain the construction details of air plasma torch. | Remember | 14 |
| 9 | What do you understand by fourth state of matter with reference to PAM? | Understand | 15 |
| 10 | Explain the metal removal mechanism, process parameters, accuracy and surface finish of Plasma Machining. | Remember | 15 |

Prepared By:

Mr. S. Srikrishnan, Assistant Professor

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