Reg. No. : | | | | | | | | | | |

Question Paper Code: 49708

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Mechanical Engineering

14UME908 - UNCONVENTIONAL MACHINING PROCESSES

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which one is not belongs to Electrochemical processes

   (a) Electrochemical Machining (b) Electrochemical Grinding

   (c) Electro Jet Drilling (d) Electron Beam Machining

2. Match the following non-traditional machining processes with the corresponding material removal mechanisms

Machining process	Mechanism of material removal
P. Chemical machining	1. Erosion
Q. Electro-chemical machining	2. Corrosive reaction
R. Electro-discharge machining	3. Ion displacement
S. Ultrasonic machining	4. Fusion and vaporization

   (a) P-2, Q-3, R-4, S-1 (b) P-2, Q-4, R-3, S-1

   (c) P-3, Q-2, R-4, S-1 (d) P-2, Q-3, R-1, S-4

3. The vibrating frequency used for the tool in Ultrasonic machining is of the order of

(a) 10,000 oscillations per second (b) 20,000 oscillations per second

(c) 35,000 oscillations per second (d) 45,000 oscillations per second

4. In which of the following gases is not used in Abrasive jet machining?

(a) Air (b) Nitrogen (c) Carbon di-oxide (d) Argon

5. Tool material used in EDM process is

(a) Copper (b)Copper – Tungsten (c) Graphite (d) All the above

6. In EDM, better surface finish is obtained at

(a) low frequency and low discharge current

(b) low frequency and high discharge current

(c) high frequency and low discharge current

(d) high frequency and high discharge current

7. In which of the following methods, an electrolyte is used

(a) Ultrasonic Machining (b) Electrochemical Machining

(c) Abrasive Jet Machining (d) Laser Beam Machining

8. In which of the following, an electrochemical oxidation on the work surface takes place

(a) Electrochemical grinding (b) Electrical discharge Machining

(c) Electrochemical Machining (d) Ultrasonic Machining

9. Identify which is a solid state laser

(a) Ruby laser
(b) Neodymium doped glass laser
(c) Neodymium doped Yitrum-Aluminium-Garnet laser
(d) None of the above

10. Which of the following is used as gas laser in Laser beam machining?

(i) Helium-neon (ii) Agron (iii) CO_2

(a) i only (b) i & ii (c) ii & iii (d) All the above

PART - B (5 x 2 = 10 Marks)

11. State the characteristics of unconventional machining processes

12. Name the carrier gases used in AJM process

13. Name the dielectric fluids commonly used in EDM process.

14. How maskants are selected

15. Identify the essential constituents of the electron gun.

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss the various classification of unconventional machining process. (16)

Or

(b) (i) Compare and contrast the various aspects of conventional and unconventional machining processes. (8)

(ii) Discuss about the economics of various unconventional machining processes. (8)

17. (a) Explain the principle, process parameters of abrasive water jet machining process with necessary sketch and also state its merits. (16)

Or

(b) Describe the principle and working of a USM with a neat sketch. (16)

18 (a) Explain the principle, process parameters of wire EDM process with necessary sketch and also state its applications. (16)

Or

(b) Explain the process of wire cut EDM and list any two of its advantages, limitations and applications. (16)

19. (a) Explain the principle and working of CHM. Mention any four advantages, (16)

Or

(b) With a help of a neat illustration, explain the process of ECG and ECH. (16)

20. (a) Describe, with the help of a neat sketch, the working of a solid state laser beam machining process. (16)

Or

(b) Briefly discuss about the constructional features of electron gun used for generating an electron beam in EBM. (16)

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