KUMARAGURU
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Register Number:……..

B.E DEGREE EXAMINATIONS: NOV / DEC 2014

(Regulation 2009)

Sixth Semester

MECHANICAL ENGINEERING

MEC124: Unconventional Machining Processes

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which of the following is the finishing process
   a) AWJM b) AJM
   c) USM d) AFM
2. The commonly used process for making cooling holes in a turbine blade is
   a) USM b) AWJM
   c) LBM d) EBM
3. AJM is best suited for machining
   a) Aluminium b) Glass
   c) Mild Steel d) Cast Iron
4. Lowering the temperature of the work piece during USM result in
   a) Increased MRR b) Decreased MRR
   c) No effect on MRR d) First decreases and then increases
5. If the flushing system of EDM machine is inefficient, the machining cycle time will be
   a) Longer b) Shorter
   c) No effect d) No definite trend
6. For maximum power delivered through the circuit during EDM, the ratio of breakdown voltage to supply voltage is
   a) 0. b) 0.72
   c) 0.75 d) 1.0

7. Desirable properties of electrolytes used in ECM are
   a) High electrical conductivity
   b) High thermal conductivity
   c) Low specific heat
   d) High specific heat
8. Electrochemically machined surface have
   a) High residual stresses and improved fatigue strength
   b) High residual stresses and reduced fatigue strength
   c) Insignificant residual stresses and reduced fatigue strength
   d) Insignificant residual stresses and improved fatigue strength
9. LBM system cannot effectively machine
   a) Refractory materials
   b) Tungsten Carbide
   c) Copper
   d) Mild Steel
10. The temperature of Plasma in Plasma Arc machining is of the order of
   a) 5000ºC
   b) 10000ºC
   c) 20000ºC
   d) 33000ºC

PART B (10 x 2 = 20 Marks)

11. What is the necessity for unconventional machining processes?
12. How the modern machining processes are classified?
13. Name any four variables in AJM that influence the metal removal rate and accuracy.
14. Name any four abrasive materials used in USM.
15. What are the properties required for dielectric fluid for EDM?
16. What is meant by relative electrode wear in EDM?
17. List any four desirable characteristics of an electrolyte used in ECM.
18. What are the factors affecting the accuracy of the parts produced by ECM?
19. State the characteristics of laser beam.
20. What are the parameters that govern the performance of PAC?

PART C (5 x 14 = 70 Marks)

21. a) Compare the different un-conventional machining processes with reference to (i) Applications (ii) Type of materials (iii) Process parameters.

(OR)

b) With a neat sketch, explain the process of AJM. List its advantages and limitations.

22. a) Discuss the effects of the following parameters on MRR and surface finish in USM.

(i) Amplitude and frequency (ii) Abrasive size (iii) Concentration of abrasives (iv) Material hardness.

(OR)

b) With a neat sketch, explain the principle of working of WJM process. List the advantages and disadvantages of WJM process.

23. a) Explain the three types of spark generators used in EDM in detail.

(OR)

b) Explain the process of EDM, its process parameters and applications.

24. a) Explain the working principle of electrochemical machining (ECM) with a neat diagram. State its advantages, limitations and applications.

(OR)

b) With a neat sketch, explain the principle of electro chemical grinding, state the process capabilities and applications.

25. a) Explain the thermal features of LBM. Discuss the performance of various types of lasers.

(OR)

b) Explain the principle of operation of EBM with a neat sketch. State its advantages, disadvantages and applications.

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