Assignment - Week 1

1. What type of tool material is used in USM
   (a) Brittle,
   (b) Ductile
Ans. (b)

2. The main drawback of the magnetostrictive transducer is
   (a) Low efficiency
   (b) Low loss
   (c) Need for extra power
   (d) Need for continuous heating
Ans. (a)

3. Silver steel tools are recommended in USM for machining
   (a) Sintered carbides
   (b) Titanium carbide
   (c) Titanium aluminum nitride
   (d) Tungsten carbide
Ans. (d)

4. The dominant mechanism involved in USM of all materials is
   (a) Two body abrasive
   (b) Three body abrasive
   (c) Direct hammering
   (d) Elastic deformation
Ans. (c)

5. Relative material removal rate (%) for machining titanium in USM is
   (a) 66
   (b) 4.0
   (c) 1.4
   (d) 4.8
Ans. (b)

6. Abrasive carrying liquid for the abrasive slurry in USM is
   (a) Water
   (b) Heavy paraffin oil
   (c) Silicone oil
   (d) Glycerol
Ans. (a), (d)

7. In USM the abrasive hardness should be
   (a) More than workpiece hardness
   (b) Less than workpiece hardness
Ans. (a)

8. In USM the power capacity of piezoelectric transducer is
   (a) 750 W
   (b) 230 W
   (c) 900 W
   (d) 550 W
Ans. (c)

9. The number of impacts on the workpiece by abrasive grits in each cycle is dependent upon the
   (a) Diameter of the crater
   (b) Type of the abrasive grit
   (c) Depth of crater
   (d) Diameter of the abrasive grit
Ans. (d)

10. What type of tool should be used to reduce power requirement during large diameter hole drilling in USM
    (a) Trepanning tool
    (b) Annular cutters
(c) Drilling tool
(d) Hypodermic needle
Ans. (a)

11. Increase in abrasive grain size in USM results in
   (a) Lower MRR, Higher surface finish
   (b) Higher MRR, Lower surface finish
   (c) Higher MRR, Higher surface finish
   (d) Lower MRR, Lower surface finish
Ans. (b)

12. USM works very well when the workpiece hardness is greater than
   (a) HRC 30
   (b) HRC 40
   (c) HRC 60
   (d) HRC 90
Ans. (c)

13. In USM process, which type of material can be easily machined
   (a) Glass
   (b) Stainless steel
   (c) Brass
   (d) Mild steel
Ans: (a)

14. 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
(Ans:b)

15. In Ultrasonic machining, the material is removed by
   a. anodic dissolution
   b. thermal melting
   c. abrasive action
   d. electrochemical oxidation
(Ans:c)

16. In Ultrasonic machining, the function of transducer is to
   a. convert mechanical energy into heat
   b. convert electrical energy into heat
   c. convert electrical energy into mechanical vibrations
   d. convert mechanical energy into electrical energy
(Ans:c)

17. In Ultrasonic machining, the tool
   a. moves in transverse direction
   b. moves in longitudinal direction
   c. vibrates in transverse direction
   d. vibrates in longitudinal direction
(Ans:d)

18. The relationship between amplitude of tool oscillation to material removal rate (MRR) is,
   (a) Decreases and then increases
   (b) Increases and then decreases
   (c) Increasing
   (d) Decreasing
Ans: (b)
19. Ultrasonic machines, used in material removal processes, require ultrasonic transducers. The transducers work on different working principles. One of the working principles of such ultrasonic transducers is based on
(a) Piezo-electric effect
(b) Magnetostrictive effect
(c) All of the above
Ans. (c)

20. Tolerance achieved in USM is in the range of
   (a) 7-25 μm
   (b) 5-10 μm
   (c) 8-40 μm
   (d) 9-30 μm
Ans. (a)