

Code : 021617

B.Tech 6th Semester Examination, 2017

Non Conventional Manufacturing

Time : 3 hours

Full Marks : 70

Instructions :

- (i) There are Nine Questions in this Paper.
- (ii) Attempt Five questions in all.
- (iii) Question No. 1 is Compulsory.
- (iv) The marks are indicated in the right-hand margin.

1. Answer/Choose the most appropriate option of the following
(any seven) : $2 \times 7 = 14$

(A) Which of the following is a non-traditional machining method?

- (a) Milling
- (b) Drilling
- (c) Grinding
- ~~(d)~~ ultrasonic machining

(B) The gap between nozzle tip and workpiece in abrasive jet machining is approximately equal to

- ~~(a)~~ 1 mm
- (b) 1 cm
- (c) 1 m
- (d) 2 m

(C) Which of the following method uses very high frequency vibration for machining?

- (a) Abrasive jet machining
- ~~(b)~~ Ultrasonic machining
- (c) Electric discharge machining
- (d) Electrochemical machining

(D) The purpose of using sodium bicarbonate powder in abrasive jet machining is

- (a) to clean the cut
- (b) to increase the cutting efficiency
- ~~(c)~~ to act as mixer for abrasive particles
- (d) to provide neutral atmosphere around the jet.

(E) Consider the following statements:

- (i) Abrasive jet machining uses finer abrasive particles as compared to abrasive water jet machining.
- (ii) Nitrogen and carbon dioxide are used to mix abrasive particles in abrasive jet machining.
- (iii) Abrasive jet machining finds applications in food industries.
- (iv) Abrasive jet machining is used to cut softer materials.

of these statements:

- ~~(a)~~ (i) and (ii) are true
- (b) (iii) and (iv) are true
- (c) (ii) and (iii) are true
- (d) (i), (iii) and (iv) are true

(F) Which of the following material can be used as tool material in EDM?

- (i) Copper
- (ii) Brass
- (iii) Graphite

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Of these

- (a) (i) and (ii) (b) (iii)
~~(c)~~ (i), (ii) and (iii) (d) (ii) and (iii)

(G) Which of the following methods uses combination of electrical and chemical energy for machining?

- (a) Ultrasonic machining
(b) Abrasive jet machining
~~(c)~~ Electrochemical machining
(d) Electron beam machining.

(H) In electric discharge machining, 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

(I) The material removal in electrochemical machining varies

- (a) Inversely proportional to the gap between work and tool electrode
(b) Inversely proportional to the square of the gap
(c) Directly proportional to the square of the gap
(d) Directly proportional to the gap.

(J) Ultrasonic machining removes material from the workpiece by

- ~~(a)~~ Hammering action of abrasive particles
(b) Rubbing action between tool and workpiece
(c) High frequency sound
(d) High frequency eddy currents

2. (a) Write down the classification of unconventional machining processes on the basis of energy. 7

(b) What are the difference between conventional machining and unconventional machining processes? 7

3. (a) Explain the working principle of electric discharge machining (EDM) with neat sketch. 7

(b) Explain the advantage and disadvantage of EDM. 7

4. What is the function of an abrasive slurry in ultrasonic machining (USM)? Explain how the abrasive selection is made. 14

5. Explain the working principle of ultrasonic welding with neat sketch. What are the advantage and limitation? 14

~~6~~ What are the difference between leaser welding and electron beam welding? 14

7. What are the requirements of good weld ? Also write the condition to avoid the weld defect. 14

~~8~~ Explain explosive welding process. What are the advantage, limitation and its applications? 14

~~9~~ Write short notes on any two following: 14

- (a) Explosive forming
(b) Under water welding
(c) Electromagnetic forming
