[Total No. of Questions - 9] [Total No. of Pr. d Pages - 3]
(2126)

16211(D) - 0 DEC 2016

B. Tech 7th Semester Examination

Modern Manufacturing Processes (NS)

ME-411(a)

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : This question paper carries five sections. Attempt any five questions selecting atleast one question each from section A, B, C & D. Section E is compulsory.

SECTION - A

1. (a) Write the four basic mechanisms by which material removal in ultrasonic machining can take place. (6)

   (b) Classify modern machining processes on the basis of the type of energy employed. Also, state the mechanism of material removal, transfer media, and energy sources used. (14)

2. (a) Write the constraints that limit the performance of different kind of modern manufacturing process. Also, write the circumstances under which individual process will have advantage over others. (12)

   (b) State the basic components used in ultrasonic machining and briefly explain the function of each component. (8)

SECTION - B

3. (a) Explain the working principle of water jet machining. Write a note on the special features of equipment used in this method of machining. (13)

   (b) What are the functions of an electrolyte? What factors need to be considered while selecting it? Discuss the advantages and limitations of some electrolytes. (7)

4. (a) State the requirements of abrasive particles in abrasive jet machining and explain the effect of particle size and flow rate on material removal rate and surface finish. (10)

   (b) Explain the working principal of electro-chemical machining. What are the various materials that can be machined by electro-chemical machining process? (10)

SECTION - C

5. (a) Explain the various parameters that may affect the machining in EDM process. (10)

   (b) LBM and EDM both are thermal processes. However, it is found that the first one results in more thermal damage to the machined component than the second one. Is it true? Justify your answer. (10)

6. Explain the working principle of wire LBM with the help of neat sketch. What are the advantages and disadvantage of LBM and its area of applications? (20)

SECTION - D

7. (a) Discuss in detail the application of plasma arc system in (i) cutting and (ii) surfacing. (10)

   (b) Explain the working principle of EBM process. Also explain the need of high vacuum, medium vacuum and no vacuum in various applications. (10)

8. (a) Explain how electron beam is generated and controled in electron beam machining with the help of neat sketch. (10)

   (b) Explain the mechanism of metal removal with the help of plasma arc machining. (10)

SECTION - E
(Compulsory Question)

9. Write short answers of the following:

   (a) Explain the functions of a "horn" in ultrasonic machining.

   (b) What do you mean by pulsation? How do you minimize pulsation in water flow?

   (c) Illustrate the effect of magnitude of current during EDM.

   (d) Write down the advantage and disadvantage of ECM.

   (e) How does laser operate and what does it consists of? Of what materials the laser are made and what are its uses?

   (f) List some safety precautions taken while conducting PAM.

   (g) How does increasing discharge current affect metal removal rate and surface finish in electrical discharge machining?

   (h) List out the various steps involved in the selection of tool.

   (i) Mention some disadvantages of the plasma arc cutting.

   (j) Selection criteria of electrodes for spark emission in EDM. (2×10=20)