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**Question Paper Code: 59711**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Elective

Mechanical Engineering

15UME911 - UNCONVENTIONAL MACHINING PROCESS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. In mechanical machining, material removed by CO1 -R  
(a) erosion                      (b) corrosion                      (c) abrasion                      (d) vaporization
2. Shaping and milling are used to generate which one of the following? CO1- R  
(a) flat surfaces                      (b) cylindrical surfaces  
(c) spherical surfaces                      (d) irregular surfaces
3. Which is a softer material in USM? CO2- R  
(a) tool                      (b) work piece                      (c) both of them                      (d) none of the above
4. Which type of materials can be machined in abrasive jet machining? CO2- R  
(a) Glass                      (b) Ceramics                      (c) Hard material                      (d) All of them above
5. What are the values of gaps between the electrodes in EDM? CO3- R  
(a) 0.001-0.05mm                      (b) 0.01-0.5mm                      (c) 0.1-5mm                      (d) 1-15mm
6. How much amount of burr produces when we used wire electrode discharge machining for machining of work pieces? CO3- R  
(a) 10%                      (b) 20%                      (c) no burr                      (d) small amount

7. What is the value of voltage that the power supply unit supplies for ECM? CO4- R
- (a) 0.01 to 1V            (b) 2 to 30 V            (c) 50 to 80 V            (d) 100 to 160 V
8. By using chemical machining, which of the following can be produced? CO4 -R
- (a) pockets            (b) contours            (c) slots            (d) all of mentioned
9. Which of the following laser is cutting for thick materials in LBM? CO5 -R
- (a) CO<sub>2</sub>+gas assisted            (b) CO<sub>2</sub> only            (c) Nd-YAG            (d) Ruby
10. How are the production times for material in electron beam machining? CO5 -R
- (a) very small            (b) small            (c) moderate            (d) long

PART – B (5 x 2= 10Marks)

11. Differentiate the conventional and unconventional machining processes in terms of principle? CO1 -R
12. Name the abrasive materials that are used for the AJM. CO2 -R
13. What is the purpose of maskant and how is it classified. CO3 -R
14. Why is a servo-control system is required in EDM CO4- R
15. What are the gases used in PAM. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Classification of unconventional machining processes on the basis of type of energy employed, material removal rate, transfer media and mechanism. CO1 -App    (16)
- Or
- (b) Explain the factors that should be considered during the selection of an appropriate unconventional machining process for a given job. CO1- App    (16)

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| 17. | (a) | (i) Explain construction and working principle of AJM with help of schematic diagram.                                 | CO2- App | (10) |
|     |     | (ii) Mention the advantages and limitations of AJM.   | CO2- App | (6)  |
|     |     | Or  |          |      |
|     | (b) | (i) Explain the principle of USM and its equipment.   | CO2 -Ana | (8)  |
|     |     | (ii) Explain the factors, which influence the material removal rate MRR in USM and advantages and limitations of USM. | CO2- Ana | (8)  |
| 18. | (a) | What are the important process parameters in EDM process and explain it.  | CO3- Ana | (16) |
|     |     | Or  |          |      |
|     | (b) | Explain the process of Electrical discharge wire cutting and list of its advantages, limitations and applications.    | CO3 -Ana | (16) |
| 19. | (a) | Briefly explain the various process parameters of ECM.  | CO4- U   | (16) |
|     |     | Or  |          |      |
|     | (b) | Describe construction and working of chemical machining.  | CO4 -Ana | (16) |
| 20. | (a) | Explain the principle of LBM with neat sketch and list out the advantages and disadvantages?                          | CO5- U   | (16) |
|     |     | Or  |          |      |
|     | (b) | (i) What is EBM? Sketch its setup and indicate its main parts and operation.  | CO5 -U   | (12) |
|     |     | (ii) Mention the application of EBM   | CO5- U   | (4)  |

