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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Sixth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; June/July - 2015

Non-Conventional Machining

Time: 3 hrs

Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART - A

- 1 a. Justify the need of Non-Conventional machining process. 6
- b. With a neat sketch explain types of tool feed mechanism used in ultrasonic machining. 8
- c. Briefly explain the following elements of the ultrasonic machining: 6
 - i) Work material
 - ii) Tool cone and tool tip
 - iii) Abrasive Slurry
- 2.a. List the variables in abrasive jet machining. Explain any two of them. 8
- b. With a neat sketch explain abrasive jet machining. 7
- c. List the advantages of Abrasive jet machining. 5
- 3 a. Describe the chemistry involved in the ECM process. 6
- b. Calculate the machining rate and the electrode feed rate when iron is electrochemically machined, using copper electrode and sodium chloride solution (specific C resistance = 5.0 Ω cm). The power supply data of the ECM machine used are : supply voltage 18 VD.C, Current 5000 amp A 'tool – work' gap of 0.5 mm (constant) may be assumed, current efficiency taken as 100 percent with sodium chloride electrolytes for iron (anode), atomic weight N = 56, Valency n = 2, density $d = 7.87 \times 10^6$ gm/m³. 6
- c. List the factors which govern the accuracy surface finish and work material characteristics of the parts produced characteristics of the parts produced by ECM. Explain any two of them. 8
- 4 a. Explain electrochemical grinding with a neat sketch. 8
- b. With a neat sketch explain any two types of tooling technique used in ECM. 6
- c. With a neat sketch explain electro chemical Honing. 6

PART – B

- 5 a. With a neat Block diagram explain steps of chemical blanking process. 12
- b. Mention the application of chemical machining. 4
- c. List the advantages of CHM. 4
- 6 a. With a neat sketch explain mechanisms of metal removal in EDM process. 8
- b. With a neat sketch explain electrode feed control in EDM. 7
- c. List the essential requirements of dielectric fluid used in EDM process. 5

- 7 a. What is Flushing? With a neat sketch explain pressure flushing and suction flushing used in EDM process. 10
- b. With a neat sketch explain travelling wire EDM. 10
- 8 a. Explain the principle of Plasma Arc Machinery (PAM) with sketch. 10
- b. Explain the following in plasma arc machining :
 - i) Safety precautions 10
 - ii) Advantages

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