Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **M.Tech.**
P2PUCC01

2nd Semester Regular / Back Examination 2017-18
NON-TRADITIONAL MACHINING
BRANCH : PRODUCTION ENGG,
PRODUCTION ENGG AND OPERATIONAL MGT
Time : 3 Hours
Max Marks : 100
Q.CODE : C645

Answer Question No.1 which is compulsory and any four from the rest.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Q1 **Answer the following questions :** **(2 x 10)**

a) List the unconventional machining process which uses mechanical energy?
b) Reuse of abrasives is not recommended in AJM. Why?
c) What are the advantages of WJM over conventional cutting methods?
d) What are factors that affect the selection of an etchant in chemical machining?
e) What are essential characteristics of an electrolyte used in ECM process.
f) Write the basic principle of chemical machining process.
g) What are the advantages of Laser drilling?
h) Why the servo controlled system is needed in EDM?
i) What is the purpose of concentrator used in USM?
j) Name the important factors that should be considered during the selection of an unconventional machining process for given job.

Q2 **a)** Distinguish between conventional and unconventional machining processes. What are the basic factors upon which the unconventional machining processes are classified? Explain. **(10)**

b) Explain laser and lasing process. List different types of lasers and their machining applications in industry. **(10)**

Q3 **a)** Explain the basic working principle of Abrasive Jet Machining (AJM) process with suitable sketches. Describe at least three typical engineering applications of AJM. **(10)**

b) Distinguish between cut and pearl resists and photographic resists in chemical machining. **(10)**

Q4 **a)** Write a note on the special features of the equipment used in the method of chemical machining. **(10)**

b) Discuss the principle of laser beam machining, and also discuss its process capability and applications. **(10)**

Q5 **a)** Explain the working principle of Electrochemical Machining (ECM) and also elaborate the electrochemistry of the ECM process. **(10)**

b) The composition (% by weight) of the Nimonic 75 alloy is as given here: **(10)**

Element	% by weight	Gram atomic weight	Valency of dissolution	Density(g/cm^3)
Ni	72.5	58.71	2/3	8.90
Cr	19.5	51.99	2/3/6	7.19
Fe	5.0	55.85	2/3	7.86
Ti	0.4	118.69	2/4	7.30
Si	1.0	28.09	4	2.33
Mn	1.0	54.94	2/4/6/7	7.43
Cu	0.6	63.57	1/2	8.96

Calculate the removal rate (in cm^3/min) when a current of 1000amp is passed. Use the lowest valency of dissolution for each element.

Q6 **a)** With the help of a suitable diagram, explain the working of Ultrasonic Machining and also discuss the effect of various process parameters on material removal rate (MRR) and accuracy of the machined work piece. **(10)**

b) What do you mean by transducer and magnetostriction effects? Explain the function of horn in ultrasonic machining process? **(10)**

Q7 **a)** Describe in detail the working, process parameters, equipment and mechanism of material removal of Electric Discharge Machining. **(10)**

b) Why is flushing important in Electric Discharge Machining? Explain and discuss how it is accomplished. **(10)**