

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

TIME – 3 Hrs 15 Min

THEORY EXAMINATION – JAN 2021

B.Tech. – Mechanical Engg.

SEMESTER – VII

M.M. - 56

PAPER - ME-417

SUBJECT- Non-Conventional Machining

INSTRUCTIONS TO BE FOLLOWED

- Allotted time for examination is 3 hours 15 minutes that includes time for downloading the question paper, writing answers, scanning of answer sheets and E-mailing the PDF files to the designated Email ID.
- For all B Tech. Mechanical Engineering Students, the Email ID is:- btechmechuiet@kuk.ac.in
- The candidates will be required to attempt 75% of the question paper (maximum) by choosing to their any best questions accumulating 56 marks.
- The PDF files should be saved as Roll No. and Subject Code. Proper attention should be given while sending the email and in the subject line, the Roll Number and Subject Code should be mentioned.
- Maximum Page Limit should be 20 (Twenty) for attempting the question paper on A4 sheets which could be downloaded and printed from the sample sheets given in the Kurukshetra University Examination guidelines.
- Over-attemptation should be avoided.
- Handwriting should be neat and clean and diagrams should be clear and contrasted.
- The candidate should not write their Mobile No. otherwise Unfair Means Case will be made.
- While attempting the paper, the candidate will use blue/black pen only.
- Before attempting the paper, the candidate will ensure that he/she has downloaded the correct question paper. No complaint for attempting wrong question paper by the candidate will be entertained.
- Candidate must ensure that he/she has put his/her signature on each page of the answer sheet used by him/her. Answer sheet without the signature of the candidate will not be evaluated.

PART-A

Q. No. – 1 Answer the following questions.

15x1=15

(i)	Tool in USM is generally made of a) Glass b) Ceramic c) Carbides d) Steel		
(ii)	Which of the following material cannot be machined using electro chemical machining? a) Iron b) Aluminium c) Copper d) Wood		
(iii)	Why different abrasives produce different MRR in AJM?		
(iv)	Match the most suitable manufacturing processes for the following parts. <table style="width: 100%; border: none;"><tr><td style="width: 50%;">Parts P. Computer chip Q. Metal forming dies and moulds R. Turbine blade S. Glass</td><td style="width: 50%;">Manufacturing Processes 1. Electrochemical Machining 2. Ultrasonic Machining 3. Electro-discharge Machining 4. Photochemical Machining</td></tr></table>	Parts P. Computer chip Q. Metal forming dies and moulds R. Turbine blade S. Glass	Manufacturing Processes 1. Electrochemical Machining 2. Ultrasonic Machining 3. Electro-discharge Machining 4. Photochemical Machining
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(v)	List any three applications of ECM process.		
(vi)	Define the terms “Etchant” and “Maskant”.		
(vii)	Name some of the dielectric materials used in EDM.		
(viii)	State the applications of EBM process.		
(ix)	Give any two advantages of LBM process.		
(x)	List important process parameters involved in PAM.		
(xi)	What is the advantage of using STL file in Rapid prototyping?		
(xii)	List various raw materials used in rapid prototyping.		
(xiii)	Define the term “rapid tooling”.		
(xiv)	Classify various indirect rapid tooling processes.		
(xv)	Define the basic principle of working of silicon rubber moulding.		

PART-B

2	If suppose USM is used for drilling a hole (under the same machining conditions) in Aluminium and Cast Iron. Which one will have higher depth of the drilled hole and why?	5
3	In a certain electro chemical dissolution process of iron, a MRR of 2 cm ³ /min was desired. Determine the amount of account of current required for the process. Atomic weight of iron =56gm, Valency at which dissolution occur =2, Density of iron =7.8 gm/cm ³ .	5
4	Explain, why vacuum is needed in Electron beam process and also tell its order.	5
5	What is the difference between rapid tooling and rapid manufacturing?	5

PART-C

6	Distinguish between Conventional Machining processes and Non-Conventional processes.	10
7	Illustrate with neat diagrams, the impact of different process parameters on metal removal rate in USM.	10

8	Distinguish between chemical machining and electro chemical machining processes. How the process parameters affect material removal rate MRR in each case?	10
9	a) What are the different ways of gap-flushing used in EDM? Discuss the factors influencing the choice of electrode material in EDM. b) Differentiate between conventional EDM and wire cut EDM.	05 05
10	Explain the impact of various parameters on metal removal in Abrasive Jet Machining process. Also examine the metal removal mechanism of the AJM process	10
11	a) How the work table is protected from getting damaged by the electron beam which has completely penetrated the workpiece. b) What are the different beam manipulation devices used for laser processing of material?	05 05
12	a) List some of the applications of Rapid prototyping in industries? b) Describe Fused deposition modelling process with a neat diagram.	05 05
13	Classify different types of rapid tooling processes. Give some applications of rapid tooling processes.	10