Register Number:……..

KUMARAGURU
college of technology
character is life

B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2014)

Sixth Semester

B.E. MECHANICAL ENGINEERING

U14METE66**:** Unconventional Machining Processes

COURSE OUTCOMES

CO1: Select appropriate advanced materials processes for a given product or component recognising material, size, precision, and surface quality requirements

CO2: Discuss the working principles and equipments of ultrasonic machining and abrasive jet machining

CO3: Outline the fundamentals of EDM and wire cut EDM processes

CO4: Understand and explain the working of ECM Processes and solve simple problems

CO5: Discuss about radiant energy processes.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Matching type item with multiple choice code CO4 [K_1]

List I	List II
A. Chemical Machining	i. Vacuum
B. Electrical Discharge Machining	ii. Abrasive Slurry
C. Ultrasonic Machining	iii. Etchant
D.Electron Beam Machining	iv. Dielectric Fluid

	A	B	C	D
a)	ii	i	iii	iv
b)	iii	iv	ii	i
c)	ii	iv	iii	i
d)	iii	i	ii	iv

2. In Unconventional Machining Process tool material Hardness is …… work piece material. CO1 [K_2]

a) Greater than b) Lesser than

c) Greater than or equal to d) Lesser than or equal to

3. Which of the statement is true regarding non-conventional machining processes CO1 [K_3]

1) Relative motion between tool and work piece is essential.
2) There is no direct contact between the tool and the workpiece in AJM.
3) Different form of conventional energy in its direct form is applied to work piece.

a) 1,3 b) 1,4
c) 1,2 d) 2,3

4. If the flushing system of EDM machine is inefficient, the machining cycle time will be CO3 [K_3]

a) Longer b) Shorter
c) No effect d) No definite trend

5. Assertion (A):Flaring in the AJM increases with the Stand Off Distance (SOD). CO2 [K_3]

Reason (R): Flaring of the jet decreases the crater diameter.

a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false d) A is false but R is true

6. The commonly used dielectric fluid in EDM process is CO3 [K_2]

a) Soap water b) De-ionized water
c) Mineral water d) Animal oil

7. Choose the correct order with regard machine a work piece using AJM. CO2 [K_3]

1-Nozzle 2-Compressor 3-Mixing Chamber 4- Work Piece

a) 2-3-1-4 b) 1-3-2-4
c) 3-4-2-1 d) 4-1-3-2

8. In ECM process, the tool has a _____ shape. CO4 [K_3]

a) Direct b) Opposite to Work piece shape
c) Conical d) Cylindrical

9. Assertion (A):LBM Cannot be controlled as accurately and machining tolerance are less in the order of 0.01 mm CO5 [K_3]

Reason (R): LBM cannot be deflected electrically.

a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false d) A is false but R is true

10. The main advantage of PAM process is — CO5 [K_3]

a) Cost
b) Smoke and noise
c) High MRR
d) Burr is produced

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. Unconventional mechanical machining process is not so effective on soft metals like aluminium. Why? — CO1 [K_2]
12. Enlist the requirement that demands the use of Non conventional machining process. — CO1 [K_3]
13. Does there is any environmental effects while using the water jet machining? — CO2 [K_3]
14. Reuse of abrasives is not recommended in AJM. Why? — CO2 [K_3]
15. Mention the importance of Kerfs in machining — CO3 [K_2]
16. Define the term Relative electrode wear or wear ratio — CO3 [K_2]
17. State the function of electrolyte used in ECM process? — CO4 [K_2]
18. List out the applications of ECG process. — CO4 [K_3]
19. What are the types of laser used for material processing? — CO5 [K_2]
20. What are the parameters that govern the performance of PAC? — CO5 [K_2]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. Explain the operational principle of AJM with help of schematic diagram and its advantages and limitations — CO2 [K_2]

22. Compare and contrast the various unconventional machining processes on the basis of type of energy employed, material removal rate, transfer media and economical aspects. — CO1 [K_4]

23. Discuss the influence of USM process parameters on material removal rate and surface finish — CO2 [K_3]

24.	Enumerate the process parameters and process capabilities wire cut EDM with suitable example. Mention its applications.	CO3	[K_2]
25.	Deliberate the chemical machining process, etchants and maskants with neat sketches.	CO4	[K_3]
26.	Explain the principle and operation of electron beam machining and provide its typical applications with limitations.	CO5	[K_3]
27.	Explain the thermal features of Laser beam machining. Discuss the performance of various types of lasers with its performance characteristics.	CO5	[K_3]

****