QPC: RD20BTECH365 AR 20 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fifth Semester – Regular) Examinations, December – 2022

BPEME5051 - Modern Manufacturing Process

(Mechanical Engineering)

Time: 3 hrs Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(1 x 10 = 10 Marks)**

Q.1. Answer ***ALL*** questions [CO#] [PO#]

a. In Abrasive jet machining, work piece material of removed by which of the following means? CO1 PO1

(i) Vaporization (ii) Electro plating

(iii) Mechanical abrasion (iv) Corrosion

b. What is the value of the amplitude obtained when we use mechanical amplifier? CO1 PO1

(i) 1 – 10 µm (ii) 10 – 40 µm

(iii) 40 – 50 µm (iv) 50 – 100 µm

c. Dielectric medium in EDM is used for CO2 PO1

(i) Flushing away the debris (ii) To decrease the material removal rate

(iii) To make the medium conducting (iv) None of the mentioned

d. Which of the following is not a function of electrolyte in ECM? CO2 PO1

(i) It completes the circuit (ii) It helps in electrochemical reaction

(iii) It carries away heat and waste product (iv) It provide non reactive environment

e. Material removal rate in EDM increases with CO2 PO1

(i) Increase in melting point of work piece (ii) Increase in Current

(iii) None of the mentioned (iv) Decrease in current

f. What is the value of velocity of plasma jet in Plasma arc machining? CO3 PO1

(i) 100 m/sec (ii) 300 m/sec

(iii) 400 m/sec (iv) 500 m/sec

g. Which of the following is not a types of laser used in Laser beam machining? CO3 PO1

(i) Solid-state ion (ii) Neutral gas

(iii) excime (iv) liquid state

h. Mechanism of material removal in Electron Beam Machining is due to _____ CO3 PO1

(i) mechanical erosion due to impact of high of energy electrons (ii) chemical etching by the high energy electron

(iii) sputtering due to high energy electrons (iv) melting and vaporisation

i. Which of the following has no role in selecting the type of growth technique? CO4 PO1

(i) Thickness of the film (ii) Stress on the film

(iii) Temperature of the film (iv) Purity of the film

j. The major advantage of rapid prototyping is?

(i) Cut cost (ii) More practical and efficient model CO4 PO1

(iii) Computer based model (iv) None of these

PART – B: (Short Answer Questions) **(2 x 10 = 20 Marks)**

Q.2. Answer ***ALL*** questions	[CO#]	[PO#]
a. Discuss the function of transducer in USM.	CO1	PO1
b. Classify the types of abrasives used in AJM process.	CO1	PO1
c. What is the effect of nozzle tip distance on material removal rate in USM process?	CO1	PO1
d. Mention the type of power generation circuits in EDM.	CO2	PO1
e. Discuss the general requirements of tool material in ECM	CO2	PO1
f. Discuss the function of flash tube in LBM process	CO3	PO1
g. Explain population inversion	CO3	PO1
h. Define about types of plasma torch.	CO3	PO1
i. Distinguish between PVD and CVD	CO4	PO1
j. Explain Reverse engineering and its advantages over conventional machining.	CO4	PO1

PART – C: (Long Answer Questions) **(10 x 4 = 40 Marks)**

Answer ***ALL*** questions	Marks	[CO#]	[PO#]
3. a. Explain the working principle, advantages, disadvantages and applications of AJM	6	CO1	PO1
b. Estimate the MRR in AJM of a brittle material with flow strength of 4 GPA. The abrasive flow rate is 2 gm/min, velocity is 200m/s, density of abrasive is 3 gm/sec.	4	CO1	PO2
(OR)			
c. Draw the schematic layout diagram of USM machining process and explain the working principle.	5	CO1	PO1
d. Explain the working principle, application and advantages of WJM	5	CO1	PO2
4. a. Differentiate between sinker EDM and wire EDM.	6	CO2	PO1
b. In electrochemical machining of pure iron a material removal rate of 600 mm^3 /min is required. Estimate current requirement. (for Iron N = 56, n = 2, ρ = 7.8 gm/cc).	4	CO2	PO1
(OR)			
c. Explain the process of material removal in CHM process, discuss its advantages and limitations	6	CO2	PO1
d. If in a RC type generator, to get an idle time of 500 μs for open circuit voltage of 100 V and maximum charging voltage of 70 V, determine charging resistance. Assume C = 100 μF.	4	CO2	PO2
5. a. Explain the thermal and non thermal generation of Plasma. With neat sketch explain how metal removal takes place in plasma arc machining.	10	CO3	PO1
(OR)			
b. With a neat sketch explain the working principle of LBM.	5	CO3	PO1
c. Explain the effect of process parameters on PAM process.	5	CO3	PO1
6. a. Write short note on i) Ion beam implantation, ii) plasma spraying	5	CO4	PO1
b. Explain process of steolithography with a neat sketch.	5	CO4	PO1
(OR)			
c. Differentiate between bulk micromachining and surface micromachining	5	CO4	PO1
d. Explain different types of Physical vapour deposition method with neat sketch	5	CO4	PO1

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