



GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, November – 2021

(Seventh Semester)

BMEPE7021 - MODERN MANUFACTURING PROCESS

(Mechanical Engineering)

Time: 3 hrs

Maximum: 100 Marks

Answer ALL Questions**The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(2 x 10 =20 Marks)****Q.1. Answer ALL questions**

- | | | [CO#] | [PO#] |
|----|---|-------|-------|
| a. | In Abrasive jet machining, work piece material of removed by which of the following means?
(i) Mechanical ablation (ii) Mechanical abrasion
(iii) Vaporization (iv) corrosion | CO 1 | PO 1 |
| b. | Increasing volume concentration of abrasive in slurry would affect MRR in the following manner
(i) increase MRR (ii) decrease MRR
(iii) would not change MRR (iv) initially decrease and then increase MRR | CO 1 | PO 1 |
| c. | Which among the following in NOT a advantage of non-conventional machining
(i) better surface finish (ii) no friction
(iii) Micro size chip formation (iv) Less skilled labour required | CO 1 | PO 1 |
| d. | Electrode gap in electro chemical machining is generally ranged from
(i) 3.1 mm to 4.2 mm (ii) 0.1 mm to 0.2 mm
(iii) 0.5 mm to 0.9 mm (iv) 1.1 mm to 1.2 mm | CO 2 | PO 1 |
| e. | Which of the following is NOT a function of dielectric fluid
(i) Flushing away the debris (ii) To decrease the material removal rate
(iii) To make the medium conducting (iv) Stabilizing the arc | CO 2 | PO 1 |
| f. | Which of the following is NOT a processing step of chemical machining
(i) Masking (ii) Etching
(iii) Synthesizing (iv) De-masking | CO 2 | PO 1 |
| g. | Electron beam machining is a/an _____ process
(i) adiabatic (ii) Thermal
(iii) Iso-thermal (iv) isentropic | CO 3 | PO 1 |
| h. | Which gas is generally NOT used as shielding gas during PAM
(i) Oxygen (ii) Nitrogen
(iii) Argon (iv) Carbon dioxide | CO 3 | PO 1 |
| i. | The core of reverse engineering is an activity called
(i) extract abstractions (ii) directionality
(iii) restructure code (iv) interactivity | CO 4 | PO 1 |
| j. | The type of rapid prototyping system which uses a laser to fuse powdered metals, plastics, or ceramics:
(i) Fused deposition modeling (ii) Solid ground curing
(iii) Selective laser sintering (iv) Stereolithography apparatus | CO 4 | PO 1 |

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

	[CO#]	[PO#]
a. Plot the effect of process parameters on MRR during AJM.	CO 1	PO 1
b. Glass is being machined at a MRR of 9 mm ³ /min by SiC abrasive at velocity of 180 m/s, if the velocity of jet is increased to 200 m/s, calculate the MRR.	CO 1	PO 2
c. Discuss the function of transducer in USM.	CO 1	PO 1
d. Differentiate between conventional grinding and ECG.	CO 2	PO 1
e. Differentiate between sinker EDM and wire EDM	CO 2	PO 1
f. Differentiate between transfer mode and non-transfer mode plasma.	CO 3	PO 1
g. Classify the types of laser used in LBM process.	CO 3	PO 1
h. Explain the function of electron gun in EBM.	CO 3	PO 1
i. Differentiate between micro and nano machining.	CO 4	PO 1
j. Define concurrent engineering.	CO 4	PO 1

PART – C: (Long Answer Questions)**(15 x 4 = 60 Marks)****Answer ALL questions**

	Marks	[CO#]	[PO#]
3. a. Explain the working principle, application and advantages of WAJM.	8	CO 1	PO 1
b. You are working in a manufacturing concern which cuts grooves in metallic bodies. The groove depth (d) is 4 mm with a tolerance of ± 0.03 mm. Groove depth and velocity of cut are related as $d = k/V$. At present, you are employing a grooving velocity $V = 10$ m/min to obtain an exact depth of $d = 4.02$ mm. However due to running of another machine nearby- a vibration introduced into the table with amplitude, $A = 0.03$ mm, angular velocity = 50π rad/s. If you still go on cutting the grooves, will they be accepted? Why?	7	CO 1	PO 2
(OR)			
c. Explain the working principle, advantages, disadvantages and applications of AJM	10	CO 1	PO 1
d. Mention the advantages of non-conventional machining.	5	CO 1	PO 1
4. a. With a neat sketch, explain the working of RC type generator in EDM.	8	CO2	PO1
b. Explain sequentially all the steps involved in chemical machining	7	CO2	PO1
(OR)			
c. Explain the working principle, application and advantages of ECM	10	CO2	PO1
d. In electrochemical machining of pure iron a material removal rate of 600 mm ³ /min is required. Estimate current requirement. (for Iron $N = 56$, $n = 2$, $\rho = 7.8$ gm/cc).	5	CO2	PO2
5. a. Explain the working principle, application and advantages of PAM.	10	CO3	PO1
b. For cutting a 150 microns wide slot in a 1 mm thick tungsten sheet (specific power consumption $C = 12$ W/mm ³ /min), an electron beam with 5 kW power is used. Determine the speed of cutting.	5	CO3	PO2
(OR)			
c. With a neat sketch explain the working principle of LBM.	10	CO3	PO1
d. Explain the process of population inversion.	5	CO3	PO1
6. a. Explain with neat sketch, any two methods of surface engineering	10	CO4	PO1
b. Explain about reverse engineering and mention its advantages, disadvantages and applications.	5	CO4	PO1
(OR)			
c. Explain process of Selective laser sintering with a neat sketch.	7	CO4	PO1
d. Distinguish between PVD and CVD.	8	CO4	PO1

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