QPC: RD20BTECH385 AR 20 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

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

BPCME5030 – Manufacturing Science – II

(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. During metal cutting process, the force at job tool contact point is measured by CO1 PO1

(i) Dynamometer (ii) Pyrometer

(iii) thermometer (iv) thermocouple

b. Which one of the following is a single point cutting tool? CO1 PO1

(i) hacksaw blade (ii) milling cutter

(iii) grinding wheel (iv) chamfering tool

c. A good cutting fluid should have CO1 PO1

(i) Low thermal conductivity (ii) High specific heat

(iii) High viscosity (iv) High density

d. The tail stock set over method preferably used for which operation CO2 PO1

(i) Thread cutting (ii) Facing

(iii) taper turning (iv) knurling

e. A lead screw with half nuts in a lathe, free to rotate in both directions has CO2 PO1

(i) V-threads (ii) Witworth threads

(iii) Acme (iv) knuckle

f. The process of removing metal by a cutter which is rotated against the direction of travel of work piece, is called CO2 PO1

(i) Up milling (ii) Down milling

(iii) Face milling (iv) End milling

g. The cutting tool in milling is mounted on CO3 PO1

(i) Spindle (ii) Arbor

(iii) Column (iv) Knee

h. In shaper machine, the mechanism for tool feed is CO3 PO1

(i) Geneva mechanism (ii) Whitworth mechanism

(iii) Ratchet and Pawl mechanism (iv) Ward-leonard system

i. In ECM, the material removal is due to CO4 PO1

(i) Corrosion (ii) Erosion

(iii) fusion (iv) ion displacement

j. In Electron beam machining, as the electrons strikes the work piece CO4 PO1

(i) Their kinetic energy is converted into heat (ii) Mechanical erosion in work piece takes place

(iii) Electro-chemical etching takes place (iv) They get scattered

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

Q.2. Answer ***ALL*** questions		[CO#]	[PO#]
a.	Explain the difference between the orthogonal cutting and oblique cutting.	CO1	PO1
b.	List the parameters that control the tool life of a single point cutting tool.	CO1	PO1
c.	Name the various cutting tool materials.	CO1	PO1
d.	Describe the types of work holding devices in lathe.	CO2	PO1
e.	With a neat sketch show the different parts of a drill bit.	CO2	PO1
f.	Name different types of milling machine.	CO2	PO1
g.	State the difference between shaper and planer machine.	CO3	PO1
h.	Enumerate the concept of grit and grade of grinding wheel.	CO3	PO1
i.	List the characteristics of PAM.	CO4	PO1
j.	Discuss briefly the applications of wire-cut EDM.	CO4	PO1

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

Answer ***ALL*** questions		Marks	[CO#]	[PO#]
3. a.	With a neat sketch explain ASA system. Mention tool signature for ORS and ASA system.	5	CO1	PO1
b.	Describe the types of chips with machining conditions.	5	CO1	PO1
	(OR)			
c.	Discuss about the various forms of wear found in cutting tools?	5	CO1	PO1
d.	A carbide cutting tool of designation 0-8-5-5-8-90-1mm (ORS) used to turn a steel work piece 30 mm diameter, with cutting speed 230 m/min and feed 0.25 mm/rev and cutting force 185 kg & feed force 110 kg. A chip thickness of 0.35 mm is obtained. Calculate shear angle, shear force, and normal force to shear force.	5	CO1	PO2
4. a.	Explain about the processes performed in the drilling machine.	5	CO2	PO1
b.	Discuss the various methods of centerless grinding.	5	CO2	PO1
	(OR)			
c.	Discuss different types of gear hobbing process with advantage and disadvantage.	5	CO2	PO1
d.	Outline the differences between capstan and turret lathe.	5	CO2	PO1
5. a.	Explain crank and slotter quick return mechanism of shaper with a neat sketch.	5	CO3	PO1
b.	In a machining operation, when cutting speed was 50 m/min the tool life of 45 min was obtained. When cutting speed was increased to 100 m/min then tool life was obtained as 10min. If tool changing time is 2 min then determine optimum cutting speed for maximum productivity.	5	CO3	PO2
	(OR)			
c.	Describe the compound indexing mechanism with an example.	5	CO3	PO1
d.	Explain the working principle of single spindle automatics.	5	CO3	PO1
6. a.	Explain the working principle, and applications of abrasive jet machining process with a neat sketch.	10	CO4	PO1
	(OR)			
b.	With a neat sketch explain the process of USM? Discuss about the factors affecting quality of the machining.	10	CO4	PO1

--- End of Paper ---