P P SAVANI UNIVERSITY

Fifth Semester of B. Tech. Examination

December 2021

SEME3051 Production Technology

16.12.2021, Thursday **Time: 09:00 a.m. To 11:30 a.m.** **Maximum Marks: 60**

Instructions:

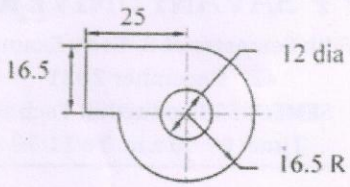
1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	Answer the Following: (Short Question)	**[05]**
(i)	Define coolant.	
(ii)	Define profiling.	
(iii)	State some examples of cutting tools materials.	
(iv)	Write some examples of non-traditional manufacturing process.	
(v)	Write the full form of USM, LBM and EBM.	
Q - 2 (a)	What are the major properties required of cutting tool materials? Why?	**[05]**
Q - 2 (b)	List the major functions of cutting fluids.	**[05]**
	OR	
Q - 2 (a)	Let n=0.5 and C = 90 in Taylor tool life equation for tool wear. What is the percent increase in tool life if the cutting speed is reduced by (a) 50% and (b) 75%.	**[05]**
Q - 2 (b)	Why are tool temperatures low at low cutting speeds and high at high cutting speeds?	**[05]**
Q - 3 (a)	List the factors that contribute to poor surface finish in cutting.	**[05]**
Q - 3 (b)	Identify the forces involved in a cutting operation. Which of these contributes to the power required?	**[05]**
	OR	
Q - 3 (a)	Describe the advantages of water jet machining.	**[05]**
Q - 3 (b)	What type of workpiece is not suitable for laser beam machining and why?	**[05]**
Q - 4	Attempt any one.	**[05]**
(i)	The cutting force increases with depth of cut and decreasing rake angle. Explain why.	
(ii)	Explain the difference between M-series and T-series high speed steels.	

SECTION – II

Q - 1	Answer the Following:	**[05]**
(i)	Punching a number of holes in a sheet is known as _____	
(ii)	Define Jig.	
(iii)	5/2 way single solenoid valve has __ ports and __ positions	
(iv)	Which type of material is best suitable for machining through abrasive water jet machining?	
(v)	Name the principle of material removal in EDM.	
Q - 2 (a)	Explain progressive die with neat sketch.	**[05]**
Q - 2 (b)	Determine the optimum strip layout with percentage utilization for the component shown below. Consider strip width 40. (all dimensions are in mm)	**[05]**



OR

Q - 2 (a)	Differentiate between punching and blanking	**[05]**
Q - 2 (b)	Explain the various methods used to reduce the shearing force	**[05]**
Q - 3 (a)	Discuss important considerations for Jig and Fixture design	**[05]**
Q - 3 (b)	Explain toggle clamp with neat sketch.	**[05]**

OR

Q - 3 (a)	Explain the nesting principle in grinding fixtures with neat sketch	**[05]**
Q - 3 (b)	Classify the nontraditional machining processes	**[05]**
Q - 4	Attempt any one.	**[05]**
(i)	Explain the working principle of EDM. Also, discuss the effect of various parameters on MRR in EDM	
(ii)	With neat sketch, explain the working of USM process	

****