

Reg.No. _____

**Karunya UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14ME2046
Sub. Name : Metal Cutting Theory and Practice

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Explain the mechanism of chip formation in ductile and brittle materials.	1	10
	b.	During machining of C 20 steel with a triple carbide cutting tool 0-8-6-7-10-70-1 mm ORS shape, the following data were obtained: feed = 0.18 mm/rev, depth of cut = 2 mm, cutting speed = 120 m/min, chip thickness = 0.4 mm. Determine chip thickness ratio and shear angle.	1	10
(OR)				
2.	a.	Draw a neat sketch of a single point tool and explain its tool signature in ASA system.	2	20
3.	a.	Discuss the Broach tool nomenclature with a neat sketch.	3	10
	b.	During machining 18mm bar on a lathe at a cutting speed of 110m/min the life of tool is found to be 60 minutes. If $n=0.2$, calculate the speed at which the spindle should be run to give a tool life of 5 hours. If a length of 50mm per component is machined, what is the cutting time per piece and how many pieces can be produced between tool changes? If the feed used is 0.15mm/rev.	4	10
(OR)				
4.	a.	Explain the nomenclature of a drilling tool with a neat sketch.	2	10
	b.	Discuss the various forces acting on a milling tool with neat sketches.	2	10
5.	a.	Explain the construction and working of a piezoelectric dynamometer used for measuring cutting force.	3	15
	b.	What are the assumptions made in Lee and Shaffer's theory?	2	5
(OR)				
6.	a.	Taylor's tool life equation for cutting HSS steel is given by $VT^n = C$, where n and C are constants. The observations noted are <div style="margin-left: 40px;"> $V(m/min)$ 25 35 $T(min)$ 90 20 </div> Calculate the cutting speed for a desired tool life of 60 min.	4	10
	b.	Explain the several cutting tool materials in detail.	4	10
7.	a.	Explain different types of tool failure and mechanism of tool wear with a neat sketch.	5	20
(OR)				
8.	a.	What are the required properties of cutting fluids?	3	10
	b.	Discuss the composition, applications, merits and demerits of different cutting fluids	3	10
<u>Compulsory:</u>				
9.	a.	What are the effects of chatter? Discuss the factors affecting machine tool chatter.	5	15
	b.	Explain the various methods to eliminate chatter.	5	5

ALL THE BEST