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Code No. : 16535 AS

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) VI-Semester Advanced Supplementary Examinations, August-2022

Metal Cutting and Machine Tools

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	State the specification of lathe machine.	2	2	1	1
2.	Name the possible operations can be performed on lathe machine.	2	2	1	1
3.	What is the advantage of hydraulic quick return mechanism in a shaper machine?	2	2	2	1
4.	A gear of 36 teeth is to be cut on a milling machine. Suggest an indexing method.	2	3	2	1
5.	How do you avoid loading in a grinding wheel.	2	3	3	1
6.	Define the term location in jigs and fixtures.	2	1	3	1
7.	List the required properties of cutting tool material.	2	2	4	1
8.	State the conditions for forming a continuous chip in metal machining.	2	1	4	1
9.	Define tool life criterion.	2	1	5	1
10.	What is meant by crater wear of a cutting tool?	2	1	5	1
Part-B (5 × 8 = 40 Marks)					
11. a)	Compare capstan and turret lathes.	4	3	1	1
b)	With a neat sketch explain anyone taper turning method on a centre lathe.	4	1	1	1
12. a)	Explain Whitworth quick return motion mechanism employed in a shaping machine.	4	2	2	1
b)	Explain the principle of universal dividing head for indexing employed in a milling machine.	4	1	2	1
13. a)	Describe the selection procedure of a grinding wheel.	4	3	3	3
b)	Compare lapping and honing processes interms of MRR and surface finish.	4	3	3	2

Contd... 2

14. a)	Describe the features ,applications and advantages of ultrasonic machining.	4	3	4	1
b)	Explain orthogonal cutting with a neat sketch.	4	3	4	1
15. a)	Compare ASA and ORS systems of tool nomenclature.	4	3	5	1
b)	List out the variables affecting machinability.	4	2	5	1
16. a)	On a centre lathe taper turning operation is undertaken with a taper of 1 in 6. The tool is wrongly set at a distance 4mm below the work piece centre. If the small end of job is having a diameter of 35mm. Calculate the actual taper obtained.	4	4	1	2
b)	Explain gear cutting by hobbing operation.	4	2	2	1
17.	Answer any <i>two</i> of the following:				
a)	Draw a broaching fixture to cut a simple key way.	4	2	3	4
b)	In an orthogonal cutting the data observed is recorded. The uncut chip thickness is 0.127mm while chip thickness is 0.228 mm. The rake angle is 10° . The cutting and thrust forces are 560N and 230N respectively. Find a) shear angle b) friction angle.	4	4	4	2
c)	Evaluate the tool life for maximum production rate when the Taylor tool life exponent is 0.2 and the tool changing time is 1.5 minutes.	4	4	5	2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%
