Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2015)

Fourth Semester

MECHANICAL ENGINEERING

U15MET403 : Manufacturing Technology - II

COURSE OUTCOMES

CO1: Apply the fundamentals of metal cutting and cutting tool materials.

CO2: Study the types of machine tools and working principles of machine tools.

CO3: Apply the different manufacturing processes to manufacture the components.

CO4: Apply the principles of surface integrity principles in finishing processes

CO5: Apply the techniques for gear manufacturing.

CO6: Apply the knowledge of economics in tool life calculation in machining.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Matching type item with multiple choice code CO1 [K1]

List I	List II
A. Carborundum	i. Opposite to the cutter
B. Up milling	ii. Horizontal surface
C. Plain Milling	iii. Silicon
D. Surface grinding	iv. Flat surface

	A	B	C	D
a)	ii	i	iii	iv
b)	iii	iv	ii	i
c)	ii	iv	iii	i
d)	iii	i	ii	iv

2. Crate wear takes place in single point cutting tool at CO2 [K1]

a) Flank b) rack face

c) Face d) Tip

3. Which of the following indexing mechanism used in milling machine CO2 [K2]

1) Differential indexing 2) Angular indexing 3) Direct indexing 4) plain indexing

a) 1,3 b) 1,4

c) 1,2 d) 2,3

4. A gradual reduction in diameter from a cylindrical work piece is CO3 [K1]

a) Chamfering b) Cylindrical turning

c) Forming d) Tapering

5. Assertion (A): Drilling is the process of making a hole. CO3 [K1]

Reason (R): Boring is the process of using a single point tool to enlarge and locate a previously made hole.

a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A

c) A is true but R is false d) A is false but R is true

6. In centre less grinders, the maximum angular adjustment of the regulating wheel is CO4 [K1]

a) 5° b) 10°

c) 15° d) 20°

7. Process planning for making a tapping process CO4 [K_1]

1) Facing 2) Reaming 3) Drilling 4) Tapping

a) 2-3-4-1 b) 1-3-2-4

c) 3-4-2-1 d) 4-1-3-2

8. Swiss type automatic machines are suitable for machining work pieces having CO5 [K1]

a) Short length and big diameter b) Big diameter with external features

c) Greater length and small diameter d) Big diameter with internal features

9. Assertion (A): Continuous chips are usually produced while cutting more brittle materials CO3 [K2]

Reason (R): Cast iron have more carbon content than steel

a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A

c) A is true but R is false d) A is false but R is true

10. Slip gauges will be finished with _____ process CO4 [K1]

a) Grinding b) Lapping

c) Buffing d) Abrasive jet

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11.	Define machinability and machinability index.	CO2	[K2]
12.	A cutting tool made of HSS have a tool life of 50 min when operated at a speed of 200 m/min. At what speed should the tool have to be operated in order to have a tool life of 2hrs 15 min. Assume n=0.185	CO2	[K3]
13.	Discriminate the planning machine and shaping machine.	CO2	[K2]
14.	Discuss the process involved in the grinding machine.	CO4	[K2]
15.	Identify the work holding devices used in drilling machine.	CO4	[K4]
16.	Respond the concept of the clapper box used in the shaping machine.	CO2	[K2]
17.	Distinguish the Lapping and Honing processes.	CO4	[K2]
18.	Define center lees grinding process.	CO4	[K2]
19.	List the factors affected the tool life.	CO2	[K_2]
20.	Outline any one of the taper turning process performed in a lathe.	CO5	[K2]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21.	Explain with a neat sketch the types of chip formation takes place during machining process.		CO1	[K3]
22.	i) Explain the various thread cutting methods performed in a lathe. ii) Narrate the use of Automatic feed mechanism used in the planer machine.	(7) (7)	CO2	[K_3]
23.	Narrate the constructional features of the single spindle automatic lathe and the functions of the vital components.		CO2	[K3]
24.	Explain in detail the types of milling cutters used in milling machines with a neat sketch.		CO3	[K3]
25.	(i) Elaborate the types of operations carried out in cylindrical grinding. (ii) Describe the types of lapping operations with a neat sketch.	(7) (7)	CO4	[K_3]

26. (i) Consolidate the various forces of a single point cutting tool. (7) CO2 [K3]

(ii) Discuss the Methods to improve the tool life. (7)

27. A cast iron surface 300 mm long and 180 mm wide is to be machined on a shaper with cutting-to-return ratio of 3:2. Cutting speed, feed and clearance are 24.6 m/min, 2 mm/double stroke and 30 mm respectively. The available ram strokes on the shaper are : 28, 40, 60 and 90 strokes/min. If the depth of cut is 3.5 mm, determine, CO5 [K_4]

(i) Time required to machine the surface

(ii) Material removal rate.

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