C.U.SHAH UNIVERSITY
Summer Examination-2017

Subject Name: Manufacturing Processes – I

Subject Code: 4TE04MPR1   Branch: B.Tech (Automobile, Mechanical)

Semester: 4   Date: 08/05/2017   Time: 02:00 To 05:00   Marks: 70

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1   Attempt the following questions: 14

1) Feed gear box for a screw cutting lathe is designed on the basis of (a) Geometric progression (b) Arithmetic progression (c) Harmonic progression (d) None

2) The ratio of thrust force to cutting force is nearly 2.5 In (a) Turning (b) Broaching (c) Grinding (d) Plain milling

3) In turning a solid round bar, if the travel of the cutting tool in the direction of feed motion is 1000 mm, rotational speed of the workpiece is 500 rpm, and rate of feed is 0.2 mm/revolution, then the machining time will be
(a) 10 seconds (b) 100 seconds (c) 5 minutes (d) 10 minutes

4) Among the conventional machining processes, maximum specific energy is consumed in (a) Turning (b) Drilling (c) Planning (d) Grinding

5) The time taken to face a workpiece of 72 mm diameter, if the spindle speed is 80 r.p.m. and crossfeed is 0.3 mm/rev, is (a) 1.5 minutes (b) 3.0 minutes (c) 5.4 minutes(d) 8.5 minutes

6) For taper turning on centre lathes, the method of swiveling the compound rest is preferred for: (a) Long jobs with small taper angles (b) Long jobs with steep taper angles (c) Short jobs with small taper angles (d) Short jobs with steep taper angles

7) Which of the following cannot be cut by hobbing process? (a) Helical gears
(b) Bevel gears (c) Worm gears (d) Spur gears

8) Quality screw threads are produced by (a) Thread milling (b) Thread chasing
(c) Thread cutting with single point tool (d) Thread casting

9) The rake angle in a twist drill
(a) Varies from minimum near the dead centre to a maximum value at the periphery
(b) Is maximum at the dead centre and zero at the periphery (c) Is constant at every point of the cutting edge (d) Is a function of the size of the chisel edge.

10) To get good surface finish on a turned job, one should use a sharp tool with a …..feed and…… speed of rotation of the job. (a) Minimum, minimum (b) Minimum, maximum (c) Maximum, maximum (d) Maximum, minimum

11) The arbor of a milling machine is used to hold which one of the following?
(a) Spindle (b) Over-arm (c) Cutting tool (d) Mandrel

12) What is the number of jaws in self-centred chuck? (a) Eight (b) Six (c) Four (d) Three

13) In milling machine, the cutting tool is held in position by (a) Chuck (b) Spindle
(c) Arbor (d) Tool holder

14) Which type of motor is NOT used in axis or spindle drives of CNC machine tools? (a) Induction motor (b) DC servo motor (c) Stepper motor (d) Linear servo motor

Attempt any four questions from Q-2 to Q-8:

Q-2	a)	Can every metal working machine be called a machine tool? Explain	07
	b)	A lathe having cone pulley drive, carries a 4-stepped cone pulley. The diameter of the 4 steps are 100 mm, 140 mm, 180 mm and 220 mm. The pinions on the spindle and the back gear shaft each carry 20 teeth while the meshing gears carry 60 teeth each. If the machine motor drives the countershaft at a speed of 300 r.p.m., calculate the different speeds which can be obtained for the lathe spindle.	07
Q-3	a)	A C.I plate measuring 300 mm × 100 mm × 40 mm is to be rough shaped along its wider face. Calculate the machining time taking Approach = 25 mm. Overtravel = 5 mm. Cutting speed = 12 m/min, Return speed = 20 m/min. Allowance on either side of the plate width = 5 mm and Feed per cycle = 1 mm.	07
	b)	Describe the different operations that can be performed on a Horizontal boring machine.	07
Q-4	a)	How the apron mechanism of a lathe works? Explain with the help of a neat diagram.	07
	b)	At what speed a 15 mm diameter drill will run, to drill a hole through a brass plate 20 mm thick, in order to cut the material at a surface speed of 60 r.p.m. Also calculate the feed used, per rev.	07
Q-5	a)	What is the difference between pitch and lead? How is it accounted for in multi-start threads?	07
	b)	What are the principal types of metal cutting saws? Describe construction and working of power hacksaw with neat sketch.	07
Q-6	a)	What is meant by a Universal grinder? How it differs from a Plain grinder?	07
	b)	Write short note on the following milling operations: i) Profile milling ii) Gear milling.	07
Q-7	a)	A hole of 100 mm diameter is bored to 110 mm diameter in two passes with a feed of 0.3 mm/rev. The boring machine spindle revolves at 400 r.p.m. Find the depth of cut, feed per minute and cutting speed.	07
	b)	How is the size of Milling machine specified? Explain.	07
Q-8	a)	What are the reasons that you cannot use end mill as a drill? Describe.	07
	b)	What is a gang drilling machine? Where is it preferred and why?	07