Enrollment No: _____   Exam Seat No:_____

C.U.SHAH UNIVERSITY
Summer Examination-2019

Subject Name : Manufacturing Process - I
Subject Code : 4TE04MPRI   **Branch: B.Tech (Mechanical)**
Semester : 4   Date : 22/04/2019   Time : 02:30 To 05:30   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)

   a) The point at which the cutting tool reaches, beyond which it will not function satisfactorily until it is reground, is called as
   1. tool wear   2. tool failure   3. tool diffusion   4. none of the above

   b) Which cutting condition affects the cutting temperature predominantly?
   1. depth of cut   2.   cutting   3. feed   4. none of the above has any effect
                            speed   on cutting temperature

   c) In metal cutting operation, maximum heat (i.e. 80-85%) is generated in
   1. the shear zone   2. the chip-tool 3. the tool-work   4. none of the above
                            interface zone   interface zone

   d) V-blocks (Vee locators) are used for clamping as well as locating when faces are inclined upto
    1. 30° 2. 12° 3. 9° 4. 3°

   e) Calculate the power required for machining of a workpiece on lathe having efficiency of 85% on full load, when tangential force required is 1200 N and cutting speed 195 m/min.
   1.   4.59 kW   2.   275.29 W   3.   3.315 kW   4. insufficient data

   f) Tool life in orthogonal cutting is
   1. more than the   2. less than the   3. equal to the   4. cannot say
   tool   life   in   tool   life   in   tool   life   in
   oblique cutting   oblique cutting   oblique cutting

   g) The productivity of honing operation is
   1. less than the   2. more than the   3.   equal   to   the   4. unpredictable
   productivity   of   productivity   of   productivity of lapping
   lapping operation   lapping   operation for the same
                            operation   workpiece

   h) How is the workpiece fed off in down milling process?
   1. In down milling process, the work   2. In down milling process, the
   piece is fed in the same direction as   workpiece is fed in the opposite direction
   that of cutter's tangential velocity   as that of cutter's tangential velocity

   i) Calculate the cutting speed of drilling operation when diameter of drill is 10 mm and rotational speed of drill is 200 r.p.m.
   1.   6.283 m/min   2.   3.142 m/min   3.   8.362 m/min   4.   10.216 m/min

   j) The cutting tool removes the metal from workpiece in the form of
   1. solid blocks   2. powder   3. chips   4.all of the above

   k) Continuous chips are formed during metal cutting operation due to
   1. ductile work 2.   large rake 3. high cutting speed   4. all of the above
   materials   angle

l) Rough grinding process is commonly used for

1. removing excess material from casting	2. cutting materials that are too hard to be machined by other conventional tools	3. producing surfaces on parts to higher dimensional accuracy	4. obtaining finer finish

m) What is the motion of cutting tool and its cutting phenomenon in shaper machine?

1. Cutting tool in shaper machine has a spinning motion and it cuts only in one direction of rotation	2. Cutting tool in shaper machine has a spinning motion and it cuts in both the clockwise and anticlockwise direction of rotation	3. Cutting tool in shaper machine has a reciprocating motion and it cuts only in forward direction of stroke	4.Cutting tool in shaper machine has a reciprocating motion and it cuts only in backward direction of stroke

n) Which of the following is not a part of carriage of the centre lathe?
1. Tool post   2. Apron   3. Compound rest   4. Gear box controls

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

Q-2   **Attempt all questions**   (14)
a) Explain in brief basic elements of machine tools.
b) How is the size of a Lathe determined? Explain the term 'Swing'.

Q-3   **Attempt all questions**   (14)
a) How the Apron mechanism of a Lathe works? Explain with the help of a neat diagram.
b) Explain Radial drilling machine with neat sketch.

Q-4   **Attempt all questions**   (14)
a) Derive an expression to determine machining time on lathe.
b) List the operations that can be carried out on a drilling machine. Explain any two with neat sketch.

Q-5   **Attempt all questions**   (14)
a) A hole of 100 mm dia, is bored to 110 mm dia, in two passes with a feed of 0.3 mm/rev. The boring machine spindle revolves at 400 rpm. Find the depth of cut, feed per minute and cutting speed.
b) How Cam milling operation is is done on a milling machine?

Q-6   **Attempt all questions**   (14)
a) What are Form milling cutters? Where are they used? What are the types?
b) List various Shaping machine attachments stating their uses. State difference between a Shaper, Planer and Slotter.

Q-7   **Attempt all questions**   (14)
a) Describe the construction of a Vertical metal bandsaw machine.
b) What is the use of cylindrical grinders? Explain the principle of cylindrical grinding.

Q-8   **Attempt all questions**   (14)
a) What is a Power hacksaw? What are the reasons of using a cutting fluid in power metal sawing?
b) What are natural and artificial abrasives? Why are the latter preferred over the former?