

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2019

Subject Name : Production Technology

Subject Code : 4TE06PTE1

Semester : 6

Date : 25/04/2019

Branch: B.Tech (Mechanical)

Time : 10:30 To 01:30

Marks : 70

Instructions:

- (1) Instructions written on main answer book are strictly to be obeyed.
 - (2) Draw neat diagrams and figures (if necessary) at right places.
 - (3) Assume suitable data if needed.
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Q-1

Attempt the following questions:

(14)

- i.** A diamond locating pin is used in jigs and fixtures because
 - (A) diamond is very hard and wear resistant
 - (B) it occupies very little space
 - (C) it helps in assembly with tolerance on centre distance
 - (D) it has a long life
- ii.** In ASA system, if the tool nomenclature is 8-6-5-5-10-15-2mm, then the side rake angle will be
 - (A) 5°
 - (B) 6°
 - (C) 8°
 - (D) 10°
- iii.** Interchangeability can be achieved by
 - (A) standardization
 - (B) better process planning
 - (C) simplification
 - (D) better product planning
- iv** Tool life in the case of a grinding wheel is the time
 - (A) between two successive regrinds of the wheel
 - (B) taken for the wheel to be balanced
 - (C) taken between two successive wheel dressings
 - (D) taken for a wear of 1 mm on its diameter
- v.** For achieving a specific surface finish in single point turning, the most important factor to be
 - (A) depth of cut
 - (B) cutting speed
 - (C) feed
 - (D) tool rake angle
- vi.** Thrust force will increase with increase in
 - (A) side cutting edge angle
 - (B) tool nose radius
 - (C) rake angle



- (D) end cutting edge angle
- vii.** In an orthogonal cutting, the depth of cut is halved and the feed rate is doubled. If the chip thickness ratio is unaffected with the changed cutting conditions, the actual chip thickness will be
 (A) doubled
 (B) halved
 (C) quadrupled
 (D) unchanged
- viii.** The angle between the face and the flank of the single point cutting tool is known as
 (A) rake angle
 (B) clearance angle
 (C) lip angle
 (D) point angle
- ix.** Internal gears are made by
 (A) hobbing
 (B) shaping with pinion cutter
 (C) shaping with rack cutter
 (D) milling
- x.** The following parameters determine the model of continuous chip formation, which one is most relevant?
 (A) true speed, chip thickness, rake angle of the cutting tool
 (B) true speed, cutting velocity, chip thickness
 (C) chip thickness, true speed, rake angle of the cutting tool
 (D) cutting velocity, chip thickness, rake angle of the cutting tool
- xi.** 3-2-1 method of location in a jig or fixture would collectively restrict the workpiece in _____ degree of freedom.
 (A) 6
 (B) 8
 (C) 9
 (D) 12
- xii.** The cutting force in punching and blanking operations mainly depends upon
 (A) the modulus of elasticity of metal
 (B) the shear strength of metal
 (C) the bulk modulus of metal
 (D) the yield strength of metal
- xiii.** In a blanking operations, the clearance is provided on
 (A) the die
 (B) both punch and die equally
 (C) the punch
 (D) nowhere
- xiv.** Single point thread cutting tool should ideally have
 (A) zero rake
 (B) positive rake
 (C) negative rake
 (D) normal rake

Answer any 4 question from Q-2 to Q-8

Q-2 (a) Define the following press operation with neat sketch

7



- (1) Perforating (2) Shaving (3) lancing (5) Nibbling
- (b) A hole of 60 mm diameter is to be produced in steel plate 2.5 mm thick. The ultimate shear strength of the plate material is 450 N/mm^2 . If the punching force is to be reduced to half of the force using a punch without shear estimates the amount of shear on the punch. Take % penetration as 40 %.
- Q-3** (a) List the types of drilling jigs. With neat sketch explain any one. 7
 (b) Draw and explain with all sketches the 3-2-1 principle of location used in jig and fixtures. 7
- Q-4** (a) What are the basic requirements of good clamping devices? 7
 (b) Discuss the strip layout used for material utilization in press working operations. 7
- Q-5** (a) Discuss with neat sketches the constructional detail of single point cutting tools. 7
 (b) Define the term “tool life”. Prove that $VT^n \cdot d^m \cdot f^x = C$ 7
- Q-6** (a) The following equation for tool life is given for a turning operation 10
 $VT^{0.13} f^{0.77} d^{0.37} = C$
 A 60 minute tool life was obtained while cutting at $V = 30 \text{ m/min}$, $f = 0.3 \text{ mm/rev}$ and $d = 2.5 \text{ mm}$.
 Determine the change in tool life if the cutting speed, feed and depth of cut are increased by 20 % individually and also taken together.
 (b) Draw and explain the provision of clearance on die and punch for both blanking and punching operations. 4
- Q-7** (a) Compare and differentiate the mechanical and hydraulic press. 7
 (b) Discuss with neat sketches the Bar stock feeding process. 7
- Q-8** (a) Write the factors affecting the selection of gear materials. How the gears are produced through casting? 7
 (b) Explain the working and constructive details of EDM process. 7

