**Enrollment No: _____ Exam Seat No:_____**

# C.U.SHAH UNIVERSITY
## Summer Examination-2016

**Subject Name : Production Technology**

**Subject Code : 4TE06PTE1** **Branch: B.Tech(Mechanical)**

**Semester : 6** **Date : 13/5/2016** **Time : 02:30 To 05:30** **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.

---

**Q-1** **Attempt the following questions:** **(14)**

**a)** A diamond locating pin is used in jigs and fixtures because
(A) diamond id very hard and wear resistant
(B) it occupies very little space
(C) it helps in assembly with tolerance on center distance
(D) it has a long life

**b)** In blanking operation the clearance is provided on
(A) the die
(B) the punch
(C) both die and punch
(D) none of above

**c)** In the 3-2-1 principle of fixture design, 3 refers to the number of
(A) clamps required
(B) locators on the primary datum face
(C) degree of freedom of the workplace
(D) operations carried out

**d)** Material utilization n press working is the ratio of
(A) total area of blank cut/area of uncut strip
(B) cut area/ uncut area
(C) Perimeter of blank
(D) none of above

**e)** The tool is designated by: 12°, 10°, 7°, 20°, 50°, 30°, 2 (mm). What is the end relief angle of the tool?
(A) 12°
(B) 7°
(C) 20°
(D) 30°

**f)** The angle between the face and the flank of the single point cutting tool is known as

(A) Rake angle
(B) Lip angle
(C) Clearance angle
(D) Point angle

**g)** In ECM, the material removal rate will be higher for metal with
(A) large density
(B) larger valency
(C) larger chemical absorption
(D) large chemical weight

**h)** Interchangeability can be achieved by
(A) standardization
(B) simplification
(C) better process planning
(D) better product planning

**i)** For achieving a specific surface finish in single point turning, the most important factor to be controlled is
(A) depth of cut
(B) cutting speed
(C) feed
(D) tool rake angle

**j)** Crater wear is predominant in
(A) carbon tool steel
(B) high speed steel tools
(C) tungsten carbide tools
(D) ceramic tools

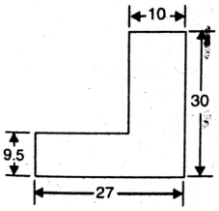
**k)** Internal gears are made by
(A) hobbing
(B) shaping with rack cutter
(C) shaping with pinion cutter
(D) milling

**l)** 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

**m)** In sheet metal work, the cutting force on the tool can be reduced by
(A) grinding the cutting edges sharp
(B) increasing the hardness of tool
(C) providing shear angle on tool
(D) increasing the hardness of die

**n)** When wrought iron, mild steel, copper and aluminium like materials are machined, the chip formed are
(A) continuous type
(B) discontinuous
(C) continuous with built up edge
(D) none of the above

| | | | |
|---|---|---|---|
| **Q-2** | (a) | Define Non-conventional machining. Why do we need these processes? Give classification of the Non conventional processes | **7** |
| | (b) | Explain Merchant's force circle diagram and write equation of forces. | **7** |
| **Q-3** | (a) | Enlist the various types of locating devices used for both Jigs and Fixture and explain any three of them with neat sketch. | **7** |
| | (b) | A throwaway carbide insert was used to machine a steel work pieces with a cutting speed of 60 m/min, tool life of 40 minutes was observed, when the cutting speed was increased to 100 m/min, the tool life decreased to 10 minutes. Calculate the cutting speed for maximum productivity, if tool change time is 2 minutes. | **7** |
| **Q-4** | (a) | Explain EDM process including its advantages, disadvantages and applications. | **7** |
| | (b) | The following equation for tool life is given for a turning operation. $VT^{0.3} f^{0.77} d^{0.37} = C$ A 30 minute tool life was obtained while cutting at V = 30 m/min, f = 0.3 mm/rev and d = 2.5 mm. Determine the change in tool life if the cutting speed, feed and depth of cut are increased by 20 % individually and also take together. | **7** |
| **Q-5** | (a) | Derive following equation for calculation of shear angle in metal cutting operation. $\tan\phi = \frac{r\cos\alpha}{1 - r\sin\alpha}$ Where, r = chip thickness ratio, $\alpha$ = rack angle and $\phi$ = shear angle | **5** |
| | (b) | Draw and discuss following clamping devices (i) Hinged Clamp and (ii) Quick Action Nut | **5** |
| | (c) | Define the following press operation with neat sketch (i) perforating and (ii) shaving | **4** |
| **Q-6** | (a) | Explain various types of single point cutting tools. State advantages of mechanically held inserted tools. | **5** |
| | (b) | Write duties and responsibilities of Production Engineer in any esteemed organization. | **5** |
| | (c) | Discuss with neat sketch Quick acting clamps. | **4** |
| **Q-7** | (a) | A washer with a 12.7 mm internal hole and an outside diameter of 25.4 mm is to be made from 1.5 mm thick strip of 0.2 % CS. Considering the elastic recovery of the material, find (a) clearance (b) blanking die-opening size (c) blanking punch size (d) piercing punch size and (e) piercing die-opening size. | **7** |
| | (b) | Write a note on gear cutting by milling. | **7** |
| **Q-8** | (a) | Describe various steps of finding the centre of pressure. Calculate the centre of | **7** |

pressure for blank shape shown herewith. 


(b) Discuss with neat sketch the gear cutting by planning. **7**