

Assignment 4
Manufacturing Systems Technology

1. The normal distribution is also classified as
 - (a) Bernoulli's distribution
 - (b) Poisson distribution
 - (c) **Gaussian distribution**
 - (d) Weighted average distribution

2. If the z-score of normal distribution is 2.5, the mean of the distribution is 45 and the standard deviation of normal distribution is 3 then the value of x for a normal distribution is
 - (a) 97.5
 - (b) 47.5
 - (c) **37.5**
 - (d) 67.5

3. If $\mu=5000$ and $\sigma=50$, the z-value of $x=5025$ is
 - (a) 0.5
 - (b) -1
 - (c) **-0.5**
 - (d) 1

4. A standard normal distribution has a mean of _____ and standard deviation of _____.
 - (a) **Zero, one**
 - (b) zero, zero
 - (c) one, zero
 - (d) one, one

5. When cutting a ductile work material, an increase in cutting speed will generally have which effect on surface finish?
 - (a) Degrade surface finish, which means high value of Ra or
 - (b) **Improve surface finish, which means lower value of Ra .**

6. Which of the following time components in the average production machining cycle is affected by cutting speed (more than one)?

- (a) Decrease or
- (b) Increase.
- (c) Unaffected.

9. A cemented carbide tool is used to turn a part with length = 18.0 in and diameter = 3.0 in. The parameters in the Taylor equation are: $n = 0.27$ and $C = 1200$. The rate for the operator and machine tool = \$33.00/hr, and the tooling cost per cutting edge = \$2.00. It takes 3.0 min to load and unload the workpart and 1.50 min to change tools. The feed = 0.013 in/rev. Determine: (a) cutting speed for maximum production rate, (b) tool life in min of cutting.

- (a) 722 ft/min. 4.06 min.
- (b) 822 ft/min. 4.56 min.
- (c) 812 ft/min. 4.06 min.
- (d) **822 ft/min. 4.06 min.**

10. A vertical boring mill is used to bore the inside diameter of a large batch of tube-shaped parts. The diameter = 28.0 in and the length of the bore = 14.0 in. Current cutting conditions are: speed = 200 ft/min, feed = 0.015 in/rev, and depth = 0.125 in. The parameters of the Taylor equation for the cutting tool in the operation are: $n = 0.23$ and $C = 850$ (ft/min). Tool change time = 3.0 min, and tooling cost = \$3.50 per cutting edge. The time required to load and unload the parts = 12.0 min, and the cost of machine time on this boring mill = \$42.00/hr. Management has decreed that the production rate must be increased by 25%. Is that possible? Assume that feed must remain unchanged in order to achieve the required surface finish. What is the current production rate and the maximum possible production rate for this job?

- (a) 2.293 pc/hr 1.01 pc/hr
- (b) **1.293 pc/hr 2.01 pc/hr**
- (c) 1.293 pc/hr 1.01 pc/hr
- (d) 1.293 pc/hr 2.51 pc/hr