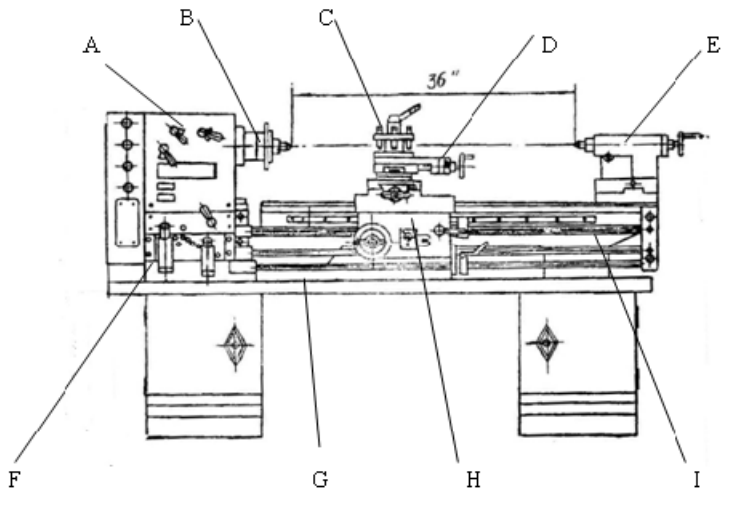


# MACHINE SHOP COURSE TEST

## Controls

Choose the correct letter to match the name of the part.



Q1. Choose the correct letter to match the name of the part in the diagram above: Headstock.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

Q2. Choose the correct letter to match the name of the part in the diagram above: Tailstock.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

Q3. Choose the correct letter to match the name of the part in the diagram above: Chuck.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

# MACHINE SHOP COURSE TEST

Q4. Choose the correct letter to match the name of the part in the diagram above: Lead screw.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

Q5. Choose the correct letter to match the name of the part in the diagram above: Compound rest.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

Q6. Choose the correct letter to match the name of the part in the diagram above: Tool post holder.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

Q7. Choose the correct letter to match the name of the part in the diagram above: Apron.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

# MACHINE SHOP COURSE TEST

Q8. Choose the correct letter to match the name of the part in the diagram above: Bed.

- A A
- B B
- C C
- D D
- E E
- F F
- G G
- H H
- I I

## Measuring

Q9. How many thousandths in an inch?

- A 1,000
- B 10,000
- C 100,000

Q10. Match the decimal equivalent for  $1/16$ .

- A .8750
- B .2500
- C .0625
- D .5000
- E .1250

Q11. Match the decimal equivalent for  $1/8$ .

- A .8750
- B .2500
- C .0625
- D .5000
- E .1250

Q12. Match the decimal equivalent for  $1/4$ .

- A .8750
- B .2500
- C .0625
- D .5000
- E .1250

Q13. Match the decimal equivalent for  $1/2$ .

- A .8750
- B .2500
- C .0625
- D .5000
- E .1250

Q14. Match the decimal equivalent for  $7/8$ .

- A .8750
- B .2500
- C .0625
- D .5000
- E .1250

# MACHINE SHOP COURSE TEST

Q15. Which measuring device is more accurate?

- A Dial caliper
- B Micrometer

Q16.  $1/16$ " is greater than 0.06".

- True
- False

Q17.  $1/4$ " is greater than 0.257".

- True
- False

Q18. What is the correct decimal equivalent for  $1/2$  inch?

- A .500
- B 5.0
- C .050
- D .505

Q19. Which number represents 8 tenths, 4 hundredths, 7 thousandths and 3 ten-thousandths?

- A .8473
- B 8.473
- C .08473
- D 847.3

Q20. Number these measuring tools from 1-3, from the most accurate to the least accurate (i.e., 1 being the most accurate): Dial caliper.

- A 1
- B 2
- C 3

Q21. Number these measuring tools from 1-3, from the most accurate to the least accurate (i.e., 1 being the most accurate): Micrometer.

- A 1
- B 2
- C 3

Q22. Number these measuring tools from 1-3, from the most accurate to the least accurate (i.e., 1 being the most accurate): Caliper.

- A 1
- B 2
- C 3

## **Threading**

Q23. The correct angle for the compound rest is \_\_\_\_\_.

- A  $29.5^\circ$
- B  $30^\circ$
- C  $60^\circ$
- D  $45^\circ$

## MACHINE SHOP COURSE TEST

- Q24. For a 55° V thread, the correct angle for the compound rest is \_\_\_\_\_.
- A 27.5°
  - B 55°
  - C 110°
  - D 27°
- Q25. What is the most precise method for measuring an external thread?
- A Thread wires
  - B Ring gauge
  - C Micrometer
  - D Depth micrometer
- Q26. The last few thousandths of a thread is cut using the \_\_\_\_\_.
- A compound rest
  - B cross feed
  - C tail stock
  - D apron handle wheel
- Q27. What do we use to properly align the threading tool to the work piece?
- A Fish tail
  - B Thread wires
  - C Dial calipers
  - D Ring gauge
- Q28. How far does the cutter advance in one revolution of the spindle when cutting 16 TPI?
- A .0625
  - B 16
  - C .032
  - D .100
- Q29. What is the correct drill size for drilling and tapping for a 1/4 x 28 TPI screw?
- A .250
  - B 7/32
  - C 3/16
  - D "E"
- Q30. What is the correct drill size for 1/2 x 13 tap?
- A 7/16
  - B Z
  - C 27/64
  - D 11mm
- Q31. When threading an even number of threads (i.e., 6, 8, 12, 16, 20, etc.), on which numbers can we engage the half nut lever?
- A Any number or half number
  - B Only even numbers
  - C Only odd numbers
  - D Only numbers that divide evenly into the thread pitch

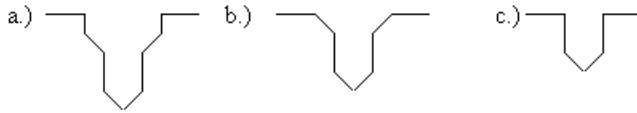
## MACHINE SHOP COURSE TEST

- Q32. When threading an odd number of threads (i.e., 5, 7, 9, 11, etc.), on which numbers can we engage the half nut lever?
- A Any number or half number
  - B Only odd
  - C Only even
  - D Any (whole) number
- Q33. What RPM is best for threading?
- A 80-100
  - B 300-400
  - C 500-600
  - D Only 300 RPM
- Q34. Finish the sentence: "Thread pitch is the distance between \_\_\_\_\_."
- A the major diameter and the minor diameter
  - B the major diameter of one thread groove and the major diameter of the adjacent thread groove
  - C thread pitch diameter and the major diameter
  - D the thread angle and the thread relief
- Q35. What is the major diameter of 7/8 x 36 external thread?
- A .36
  - B .875
  - C .875/.36
  - D .36/.875
- Q36. What is the correct way to measure the number of threads per inch?
- A Thread wires
  - B Thread mic
  - C Thread pitch gauge
  - D Micrometer
- Q37. Match the three classes of thread fit with the correct description: Class 1.
- A Loose fit
  - B Close fit
  - C Medium fit
- Q38. Match the three classes of thread fit with the correct description: Class 2.
- A Loose fit
  - B Close fit
  - C Medium fit
- Q39. Match the three classes of thread fit with the correct description: Class 3.
- A Loose fit
  - B Close fit
  - C Medium fit
- Q40. If a thread is classified as a "3B," it is \_\_\_\_\_.
- A internal
  - B external
  - C extra fine
  - D SAE coarse

# MACHINE SHOP COURSE TEST

Q41. How many wires are used when measuring an external thread?

- A 2
- B 3
- C 4
- D 6



Q42. Which hole is correctly center drilled in the diagram above?

- A a.)
- B b.)
- C c.)

## Tapers

Q43. When turning a taper, we offset the \_\_\_\_\_.

- A headstock
- B tailstock
- C cross feed
- D chuck

Q44. When turning a taper, the cutting tool should be placed \_\_\_\_\_.

- A below center
- B above center
- C on center
- D below center base on the degree of taper

Q45. What is the most precise method of measuring tailstock offset?

- A Steel rule
- B Dial caliper
- C Depth mic
- D Dial indicator

Q46. To turn a long taper, the work piece must be held \_\_\_\_\_.

- A between centers
- B in the chuck
- C in a collet
- D all of the above

Q47. How far should you offset the tailstock to turn a Morse taper of 5/8 inch per foot for a shaft 12 inches long?

- A .3000
- B .3125
- C .3625
- D .2625

## MACHINE SHOP COURSE TEST

- Q48. When using the compound rest to run a 60° included angled taper, what angle do we set the compound rest to?
- A 60°
  - B 120°
  - C 30°
  - D 15°
- Q49. What RPM range do we use when we are reaming in the lathe?
- A 80-100
  - B 300-400
  - C 900-1000
  - D 875 only
- Q50. Drilling is as accurate as reaming.
- True
  - False
- Q51. Drilling is as accurate as boring.
- True
  - False
- Q52. Cutting fluid always results in an improved finish when machining steel.
- True
  - False
- Q53. Boring is more precise than reaming.
- True
  - False
- Q54. What do you use to machine a hole over 1-1/2 inch in diameter?
- A Boring
  - B Reaming
  - C Drilling
- Q55. What do you use to correct a drilled hole that has wandered?
- A Boring
  - B Reaming
  - C Drilling
- Q56. What is the rule-of-thumb distance that over-working can protrude from the chuck or collet?
- A 2.5 times the diameter
  - B 3 times the diameter
  - C 5 times the diameter
  - D 6 inches maximum
- Q57. When using a part-off tool, the tool is set \_\_\_\_\_.
- A on center
  - B above center
  - C below center
  - D half the diameter of the part



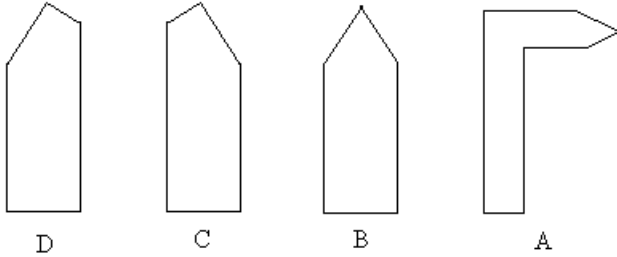
# MACHINE SHOP COURSE TEST

Q58. What RPM range do we use to part off a 1 inch diameter bar of steel?

- A 60-80
- B 200-300
- C 300-400

Q59. Cutting oil is used during a part-off operation.

- True
- False



Q60. Match the correct name of the tool above: Left Hand.

- A A
- B B
- C C
- D D

Q61. Match the correct name of the tool above: Right Hand.

- A A
- B B
- C C
- D D

Q62. Match the correct name of the tool above: Threading.

- A A
- B B
- C C
- D D

Q63. Match the correct name of the tool above: Boring.

- A A
- B B
- C C
- D D

Q64. Choose the correct angle for the end relief of an HSS **left** hand cutting tool.

- A 5-8°
- B 10-15°
- C 2-4°
- D 3-9°

Q65. Choose the correct angle side rack for an HSS **right** hand cutting tool.

- A 3-5°
- B 5-8°
- C 15-20°
- D 2-4°

## MACHINE SHOP COURSE TEST

- Q66. What is the approximate relief angle for our cutting tools?
- A 6-8°
  - B 0-2°
  - C 15-20°
- Q67. Which type of tool produces the smoothest finish?
- A Sharp nose
  - B Radiused nose
- Q68. When turning hardened steel, is a high speed steel tool bit preferred over a carbide-tipped tool bit?
- A Yes
  - B No
- Q69. Do we use cutting fluid when machining cast iron?
- A Yes
  - B No
  - C Sometimes
- Q70. In the aluminum alloy 7075-T6, what does the T6 stand for?
- A The hardness
  - B Weight per foot
  - C Length
  - D Machinability
- Q71. Which is turned at a higher RPM, aluminum or steel?
- A Aluminum
  - B Steel
  - C Not sure
- Q72. What amount of material is removed in a typical finish cut?
- A .005-.010
  - B 010-.015
  - C .050-.100
  - D .100-.150
- Q73. Choose the four most common causes of chatter in a work piece.
- A compound rest set at wrong angle
  - B excessive feed rate
  - C too high RPM
  - D wrong cutting fluid
  - E unsupported work piece
  - F dull tool
  - G cutting tool below center
- Q74. Which chuck is best suited for holding thin-walled tubing?
- A 3 jaw
  - B 4 jaw
  - C 6 jaw

# MACHINE SHOP COURSE TEST

Q75. What is the most accurate method of holding a work piece in a production application?

- A 3 jaw
- B 4 jaw
- C 6 jaw
- D Collet

Q76. When is it acceptable to leave the chuck key in the chuck?

- A Sometimes
- B Never
- C Only when the machine is turned off
- D When changing tools

Q77. Where is a good place to lay files, calipers, drills, or other tools?

- A On the head stock
- B On the lathe bed
- C In the chip pan
- D None of the above

Q78. When boring, the tool should be set \_\_\_\_\_.

- A on center
- B below center
- C slightly above center
- D on center or slightly above

Q79. Which tool is best suited for performing a facing operation on the chuck?

- A Left hand
- B Right hand

Q80. What rate of taper per foot is used with the Morse taper?

- A 5/8" per foot
- B .600" per foot
- C 3.5" per foot
- D 3/8" per foot

Q81. What rate of taper per foot is used with the following Jarno taper?

- A 5/8" per foot
- B .600" per foot
- C 3.5" per foot
- D 3/8" per foot

Q82. What rate of taper per foot is used with the Milling Machine spindle?

- A 5/8" per foot
- B .600" per foot
- C 3.5" per foot
- D 3/8" per foot

Q83. What form of screw thread is most commonly used in the United States?

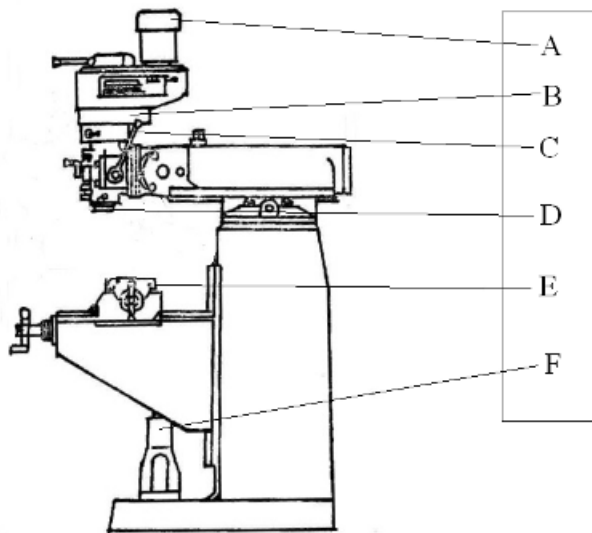
- A 60° Y type
- B 60° V type
- C 30° V type

# MACHINE SHOP COURSE TEST

- Q84. What is the common shop method of checking the pitch diameters of American Standard screw threads requiring accuracy?
- A One wire method
  - B Two wire method
  - C Three wire method
- Q85. What size tap drill should be used for an American Standard machine screw of No. 10 size, 24 threads per inch?
- A 20
  - B 25
  - C 26
- Q86. What is the diameter of a No. 10 drill?
- A .1275
  - B .1750
  - C .1935

## Mill Test Questions

Please write the letter of the correct item in the diagram next to each item listed below.



Q87. Please write the letter of the correct item in the diagram above: Quill Handle.

- A A
- B B
- C C
- D D
- E E
- F F

Q88. Please write the letter of the correct item in the diagram above: Bed.

- A A
- B B
- C C
- D D
- E E
- F F

## MACHINE SHOP COURSE TEST

Q89. Please write the letter of the correct item in the diagram above: Knee.

- A A
- B B
- C C
- D D
- E E
- F F

Q90. Please write the letter of the correct item in the diagram above: Spindle.

- A A
- B B
- C C
- D D
- E E
- F F

Q91. Calculate the approximate spindle speed required to mill a 745 nickel silver part using a 1/2 inch end milling cutter.

- A 684 RPM
- B 846 RPM
- C 1084 RPM
- D 644 RPM

Q92. List the steps for selecting the cutting conditions in their correct order.

- A Select the proper feed rate, select the proper spindle speed and select the depth of the cut
- B Select the proper spindle speed, select the depth of the cut and select the proper feed rate
- C Select the depth of the cut, select the proper spindle speed and select the proper feed rate

Q93. Why is it important to calculate the table feed rate for milling?

- A To prolong tool life
- B For safety
- C For temperature control
- D All of the above

Q94. Name the factors that affect the basic feed rate for milling.

1. Width/depth of cut
  2. Type of material to be cut
  3. Type of cutter to be used
  4. Size of the cutter
  5. The surface finish desired
  6. The power available
  7. Rigidity of the setup
- A 2., 4. and 5. above
  - B 2., 4. and 7. above
  - C 1., 2., 3., 4. and 6. above
  - D All of the above

## MACHINE SHOP COURSE TEST

- Q95. When milling a slot, it is best to \_\_\_\_\_.
- A use a smaller mill cutter and offset to mill to finished size
  - B use a mill cutter the same diameter as the width of the slot
  - C use a re-ground mill cutter
  - D start in the middle and plunge cut the beginning of the slot
- Q96. Fly cutting operations give better results when you \_\_\_\_\_.
- A use a power feed
  - B run the fly cutter at high RPM
  - C use a slow feed rate
  - D A and C above
- Q97. Light machine oil works well as a lubricant when machining \_\_\_\_\_.
- A titanium
  - B steel
  - C cast iron
  - D aluminum
- Q98. What lubricant is recommended for machining aluminum?
- A 20-50 motor oil
  - B WD-40
  - C Sewing machine oil
- Q99. When squaring and truing a part on the mill, you should de-burr the part \_\_\_\_\_.
- A when you are finished
  - B only after the first and last operations
  - C before and after each operation
  - D before you begin the process
- Q100. When boring on the mill, it is important to \_\_\_\_\_.
- A lock the quill
  - B bore at high RPM for a better surface finish
  - C keep the spindle rpm low to minimize vibration
  - D take no more than .010 per pass
- Q101. When milling, which type of cutter cuts fastest?
- A HSS on steel
  - B HSS on aluminum
  - C Carbide on aluminum
  - D Carbide on steel
- Q102. When mill cutting, which of the follow affects chip load the **most**?
- A Spindle speed
  - B Feed rate
  - C Depth of cut
  - D Size of cutter

# MACHINE SHOP COURSE TEST

- Q103. The easiest way to measure the center of a threaded hole is \_\_\_\_\_.
- A by inserting a screw and measuring from the other reference to the screw and subtract the diameter of the screw
  - B by inserting a screw and measuring across it and subtracting half the diameter
  - C by using a center punch as a locator
  - D by using an edge finder

## Shop Techniques Questions

- Q104. Is there more than one way to remove a tap that has been broken in the hole during tapping?
- A Yes
  - B No

- Q105. When using the pedestal grinder, it is best to \_\_\_\_\_.
- A use the entire surface on the wheel
  - B use only one spot on the wheel
  - C push hard until the wheel slows
  - D go slow to avoid sparks

- Q106. When a drill press or mill is drilling a hole, the drill bit \_\_\_\_\_.
- A turns counter clockwise
  - B can turn either direction
  - C turns clockwise
  - D works best at high speed

- Q107. When band sanding a part, it is best to use \_\_\_\_\_.
- A the top of the belt
  - B the part of the belt below your waist
  - C whichever part will achieve the desired results
  - D the bottom of the belt

- Q108. When inspecting a part for a dimension across dowel pins, you should measure \_\_\_\_\_.
- A across the pins
  - B from each pin to the side of the part
  - C between the pins, subtracting the pin diameter measurement
  - D as called out in the blue print

- Q109. When boring engine cylinders, the best finish will be achieved with \_\_\_\_\_.
- A a sharp cutter
  - B a smaller piston
  - C the cylinder hone
  - D a high feed rate

- Q110. When boring an engine cylinder, you always bore to \_\_\_\_\_.
- A the finished diameter
  - B under size
  - C undersize then hone to finished size
  - D to the size of the piston

## MACHINE SHOP COURSE TEST

- Q111. When using an automotive brake lathe, you should always \_\_\_\_\_.
- A start with a finish cut
  - B use the rubber strap to stop unwanted vibrations
  - C make 3 test cuts
  - D make the first cut using manual feed
- Q112. When turning a brake drum or rotor, you should \_\_\_\_\_.
- A touch off, then redo the setup and touch off again
  - B only touch off once
  - C make two roughing cuts
  - D turn rotors counter clockwise
- Q113. Pick the **most** accurate method for measuring the depth of a blind hole.
- A The tail of the dial caliper
  - B A vernier caliper
  - C A depth micrometer
  - D A height gauge
- Q114. When using the belt sander or pedestal grinder, it is best to keep what nearby?
- A Respirator
  - B Container of water to quench parts
  - C A de-burring tool
  - D Extra belts
- Q115. When operating the lathe or mill properly, chip color should be \_\_\_\_\_.
- A from brown to blue
  - B from no color to blue
  - C from blue to purple
  - D from clear to black
- Q116. When heat treating parts, it is best to use \_\_\_\_\_.
- A a heat treating oven or a professional heat treater
  - B a torch
  - C a professional heat treating only
  - D a heat treating only
- Q117. On a Steel Information Sheet, an "O" after the number of the steel designates \_\_\_\_\_.
- A machine with oil
  - B oil hardening
  - C oil or air hardening
  - D oil treated
- Q118. On a steel information sheet, an "OA" after the number of the steel designates \_\_\_\_\_.
- A oil treated-air hardening
  - B oil hardening-air tempered
  - C oil or air hardening
  - D machine in oil-air harden



# MACHINE SHOP COURSE TEST

- Q119. EDM stands for \_\_\_\_\_.
- A electrical dielectric machining
  - B electrical discharge machining
  - C electronic discharge machining
  - D excellent dielectric material
- Q120. Water jet machining uses \_\_\_\_\_.
- A an abrasive to cut with
  - B high pressure water to turn the spindle
  - C high pressure water and an abrasive to cut with
  - D high pressure water to cut with
- Q121. CNC stands for \_\_\_\_\_.
- A computer numerical communications
  - B controlled numerical computers
  - C computer numerically controlled
  - D computer non-compensated
- Q122. IMTS stands for \_\_\_\_\_.
- A International Manufacturing Tool Show
  - B International Material Technology Show
  - C International Machine Technology Show
  - D International Manufacturing Technology Show
- Q123. Free machining steel contains \_\_\_\_\_.
- A platinum
  - B lead
  - C magnesium
  - D titanium