

**Use the answer sheet provided at the end of this test ensuring that your name (or the name that you would like to appear on the certificate) and answers are clearly indicated.  
A score of 75% or more is deemed acceptable.**

**Scan the answer sheet (in jpeg format) and return it to  
THATLAZYMACHINIST@GMAIL.COM**

**The certificate has no legal recognition so don't  
get stressed out and just have fun!  
That is what hobby machining is all about.**

**P.S. you can redo the test as often as necessary,  
if at first you don't succeed ...**

## **SECTION 1 & 2: INTRO & SAFETY**

#1: A clean shop, with well stored material and tools is safer than a dirty and poorly planned shop.

True

False

(I never said that this would be difficult!)

#2: What type of material (cloth) is recommended for work clothing in the shop ?

A: Cotton

B: Wool

C: Poliester

#3: The shop should be a fun place to be, but it is important to always remember that it is a dangerous place to be. Which of the following behaviors or activities should be avoided.

A: Eating.

B: Playing jokes on co-workers.

C: Horse play or rapid displacements (running).

D: All of the above.

E: None of the above.

#3: You should always ask a friend for help when moving an object that you are unable to lift on your own!

TRUE

FALSE

#5: What types of part should be sandwiched between two thicker parts in order to avoid snagging the part when drilling?

A: All parts

B: Thick parts

C: Thin parts

#6: At what height should the blade guard be set when cutting on a bandsaw?

A: As high as possible

B: Slightly higher than part

C: Blade guards should be removed

#7: When polishing on the lathe using abrasive strips, never let the strip contact the part on more than half its outside diameter ! Why?

A: Could pull a finger nail off

B: Won't give a good finish

C: Creates too much heat

#8: Which milling direction is the safest?

A: Climb milling

B: Conventional milling

C: Fowler milling

#9: Why should magnetic grinder tables be avoided when grinding most stainless steels?

A: They are expensive

B: They should not be ground

C: They are non-magnetic

#10: Why should there always be a blotter between the grinding wheel and the mounting flanges of your grinder?

A: To avoid cracking the wheel.

B: To avoid damaging the mounting flanges.

C: To avoid an accident.

D: All of the above.

## SECTION 3: METROLOGY

#11: What makes a micrometer a direct measuring tool?

- A: It's mounted directly to the part being measured.
- B: It has a readable scale.
- C: It is a comparative measuring tool.
- D: None of the above.

#12: Which of the following tools is only a comparative measuring tool.

- A: Sine bar
- B: Steel ruler
- C: Vernier calipers
- D: Vernier protractor

#13: This tool has a very flat surface that is used as a reference for accurate measurement.

- A: Height gauge
- B: Surface gauge
- C: Surface plate
- D: Precision square

#14: Gauge blocs (joe blocs) can be used in the shop for the following:

- A: Angular measurement with a sine bar
- B: Precision tool calibration
- C: Comparative measurements
- D: All of the above

#15: What are protractors used for?

- A: Mowing the lawn.
- B: Low precision angular measurement.
- C: Measuring grooves.
- D: Removing parts from a heat treatment oven.

#16: Why are "Go and No Go" gauges easier to use than direct measuring tools?

- A: Because they do not require interpretation.
- B: Because they only indicate if a part is in or out of tolerance.
- C: Because they do not give the dimension of the part.
- D: Because they do not require a lot of skill to use.
- E: A,B,C & D are correct.
- F: None of the above.

## SECTION 4: BENCH WORK

#17: What type of hammer is used to seat a part in a vice?

- A: Dead blow hammer.
- B: Ball peen hammer.
- C: Positioning hammer.
- D: Rubber or wooden mallet.

#18: What filing technique is used for a finishing cut?

- A: Back filing.
- B: Cross filing.
- C: Push filing.
- D: Draw filing.

#19: A number 20 hacksaw blade has smaller teeth than a number 18 hacksaw blade.

True

False

#20: What are Desmond dressers used for?

- A: Truing surface grinder wheels.
- B: Sharpening single cut files.
- C: Sharpening a bench grinder wheel.
- D: Storing ones trousers

#21: What formula do we use for calculating the tap drill size?

A: Nominal thread diameter minus the thread pitch.

B: Nominal thread diameter minus the number of threads per inch.

C: Nominal thread diameter minus one depth of thread.

D: Nominal thread diameter minus the pitch diameter.

#22: What type of thread has a 29° V groove?

A: Whitworth

B: Acme

C: ISO metric

D: Unified

E: National

## SECTION 5: BLUEPRINT READING

**N.B. My project drawings can be downloaded from the first page of my website**

**THATLAZYMACHINIST.COM**

#23: The DRILL POINT GAUGE drawing is a single view drawing. Why not have used two or three views?

A: Because the depth (Z Axis) is constant.

B: Because the side, top or bottom view would make the drawing more difficult to read.

C: Because drawing the other views would be a waste of time.

D: Because the part's description does not require any views other than the front view.

E: All of the above.

F: None of the above.

#24: There is no tolerance indicated on the POSITIONING HAMMER's assembly drawing. Why?

- A: Because assembly drawings show only overall dimensions.
- B: Because all the assembled parts do not necessarily have the same tolerance.
- C: Because the hammer is not an accurate project.
- D: Because it is only meant to show how the different parts should be assembled.
- E: A,B & C are correct.
- F: A,B & D are correct.

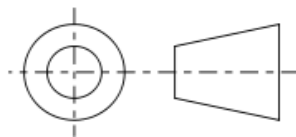
#25: Which type of line is used to define a parts visible shape ?

- A: Hidden lines.
- B: Contour lines
- C: Phantom lines
- D: Outside lines
- E: Straight lines

#26: All blueprints have this view.

- A: Bottom view.
- B: Top view.
- C: Right side view.
- D: Front view.
- E: Panoramic view.

#27: What orthographic projection angle is represented by the following symbol?



- A: First angle
- B: Second angle
- C: Third angle
- D: Fourth angle

#28: Break lines are used on a blueprint when:

- A: The part is too long to be shown completely.
- B: The drawing is going too fast and needs to slow down.
- C: The part needs to be cut in two parts along a specific line.
- D: A tool must not progress past a certain point.

#29: Which of the following imperial fits has the greatest clearance between shaft and bore?

- A: LC1
- B: RC9
- C: FN3
- D: LT6
- E: None since they are all interference fits.

## SECTION 6: LAYOUT WORK

#30: A surface gauge is often used to transfer dimensions and lines from one part to another.

True

False

#31: A height gauge is a precision direct measuring tool, a precision comparative measuring tool and a precision layout tool but it is not a car jack.

True

False

#32: A combination square is a:

- A: Bench work layout tool.
- B: A precision layout tool.
- C: A car jack
- D: None of the above

# SECTION 7: CHIPS, SPEEDS & FEEDS

#33: Discontinuous (accumulated) chips are the most desirable type of chips.

True

False

#34: Calculate the maximum R.P.M. for drilling a 1/2" hole in a piece of unhardened medium carbon steel (70 FM) using a High speed steel drill bit.

A: 320 r.p.m.

B: 800 r.p.m.

C: 560 r.p.m.

D: 1120 r.p.m.

E: None of the above

#35: A positive cutting face angle is used for cutting:

A: Soft metals

B: Stainless steels

C: Hardened tool steels

D: White cast iron

#36: A two flute end mill should feed twice the speed of a four flute end mill of same diameter.

True

False

#37: The number of teeth on a milling cutter does not affect its r.p.m..

True

False

#38: Feed on a lathe is defined as the distance that the tool advances per revolution of the part and feed on a mill is define as the distance that the part travels in one minute.

True

False



#39: A lathe tool that has a small tool noze radius should be used for roughing cuts and a large tool noze radius should be used for finishing cut.

True

False

#40: This is a mistery question. Take a chance!

True

False

## **SECTION 8: MATERIALS & METALLURGY**

#41: Which of the following steels cannot be hardened by heat treatment?

A: Low carbon steel.

B: High carbon steel.

C: Medium carbon steel.

D: Medium carbon aloy steel.

#42: What is the carbon content of 4140 steel?

A: 40%

B: 0.4%

C: 41%

D: 1.4%

#43: Which of the following hardness tests uses a diamond tip penetrator?

A: Rockwell C

B: Rockwell B

C: Brinell scale

D: Portable scleroscope

#44: Powder metallurgy is a process that is used to determine the alloy content of steel.

True

False

#45: **Plain** carbon steels that can be hardened by heat treatment must be quenched in oil.

True

False

#46: Tempering is a heat treatment used after quenching (hardening) that reduces the internal tensions in a part.

True

False

#47: Annealing is a heat treatment used to convert martensite to perlite.

True

False

## SECTION 9: SEQUENCE OF OPERATIONS

#48: A well planned sequence of operations:

A: Helps with purchasing all required materials, tools and hardware.

B: Helps with completing a project on time and in budget (reduces surprises).

C: Reduces cost by reducing number of setups required.

D: Reduces the chances of error since things are thought out and calculated in advance.

E: All of the above and then some.

#49: Did you notice that there was no question #4, and that there were two questions #3?

Yes

No

#50: The sketches that appear on a sequence of operations help to ensure that no operations are overlooked as well as help with the parts set up.

True

False

This is where the questions end. The objective here is to encourage budding machinists to watch the videos that are so very important for safe and proper machining but that are all too often overlooked. The number of views vary widely from one video to another but it is clear that many people watch attentively (and sometimes more than once) my project videos but that the more theoretical videos (materials testing, sequence of operations, safety ....) are often overlooked. This exam is all about having fun and acquiring bragging rights. The numbered and personalized certificate that I will send you upon completion of this exam can be printed and framed and I hope displayed proudly in your home shop.

# ANSWER SHEET

Name: \_\_\_\_\_ E-Mail: \_\_\_\_\_

## X marks the answer

- |                  |                 |
|------------------|-----------------|
| #1: True False   | #31: True False |
| #2: A B C        | #32: A B C D    |
| #3: A B C D E    | #33: True False |
| #4: True False   | #34: A B C D E  |
| #5: A B C        | #35: A B C D    |
| #6: A B C        | #36: True False |
| #7: A B C        | #37: True False |
| #8: A B C        | #38: True False |
| #9: A B C        | #39: True False |
| #10: A B C D     | #40: True False |
| #11: A B C D     | #41: A B C D    |
| #12: A B C D     | #42: A B C D    |
| #13: A B C D     | #43: A B C D    |
| #14: A B C D     | #44: True False |
| #15: A B C D     | #45: True False |
| #16: A B C D E F | #46: True False |
| #17: A B C D     | #47: True False |
| #18: A B C D     | #48: A B C D E  |
| #19: True False  | #49: Yes No     |
| #20: A B C D     | #50: True False |
| #21: A B C D     |                 |
| #22: A B C D     |                 |
| #23: A B C D E F |                 |
| #24: A B C D E F |                 |
| #25: A B C D E   |                 |
| #26: A B C D E   |                 |
| #27: A B C D     |                 |
| #28: A B C D     |                 |
| #29: A B C D E   |                 |
| #30: True False  |                 |