Technology Of Machine Tools 9th edition Krar Test Bank

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ANSWERS TO TEXTBOOK REVIEW QUESTIONS FOR TECHNOLOGY OF MACHINE TOOLS, NINTH EDITION

UNIT 1

1. Beginning over 50,000 years ago, tools were made of wood, animal bone, or stones. Between 4500 and 4000 B.C., copper and bronze tools replaced stone spears and axes. Around 1000 B.C., iron tools replaced bronze tools. Around 300 years ago, the iron age became the machine age.
2. more efficient production, greater product accuracy, high standard of living
3. addition of hydraulics, pneumatics, fluidics, electronics
4. chip producing, non-chip-producing, new generation
5. (a) drilling, reaming, countersinking, counterboring, tapping
   (b) turning, facing, tapering, boring, threading
   (c) flat and contour surfaces, gears, drilling, boring, reaming
6. surface, cylindrical, cutter and tool, bench or pedestal
7. speed, accuracy, efficiency, reliability
8. A chucking center is for parts held in chuck or driving device. A turning center is for shaft-type parts that must be supported by a center.
9. vertical, horizontal
10. (a) internal and external shapes
    (b) die sinking
11. to machine space-age materials and produce shapes impossible by other methods
12. increased productivity, improved part quality
13. handling materials, changing machine accessories
14. cutting and welding all types of materials; accurate measuring and sensing devices

UNIT 2

1. better quality goods, lower cost, an increase in nation's resources, generation of wealth
2. artificial intelligence, computer-integrated manufacturing, flexible manufacturing systems, robotics
3. conventional machining, CNC machining, CAD/CAM techniques, maintenance, automation, flexible manufacturing
4. a person working under skilled people to learn a trade
5. completion of high school, mechanical ability, good use of English
6. A machinist operates all machine tools; a machine operator operates only one machine tool.
7. A jobbing shop does a variety of work. A production shop makes identical parts.
8. a highly skilled person who makes dies, jigs, molds, fixtures
9. serve an apprenticeship, demonstrate above-average mechanical ability, operate all machine tools, become skilled in all machining processes, and acquire mathematics and print reading knowledge
10. A CNC programmer must possess all the skills of a CNC machine operator and also be skilled in print reading, knowledgeable of computer programming, be able to visualize processes and operations.
11. A technician makes cost estimates, prepares technical reports, programs CNC machines. A technologist assists engineer with design studies, does production planning, performs laboratory experiments, supervises technicians.
12. An inspector checks production parts for accuracy. An instrument maker works with scientists and engineers, and makes prototype parts.
13. B.S. degree, industrial experience, pass qualifying exam
14. metallurgy, aerospace, mechanical, electronics

UNIT 3

1. type of work you like, work done with success, skills acquired at school, skills in part-time work
2. read books on subject, talk to people in same work, talk to school guidance counselor, see state and federal agencies
3. Résumé should list name, address, education, special training; interests, hobbies, sports; organizations the applicant is active in; previous employment; references.
4. Submit résumé with cover letter to personnel manager, request an interview in writing or request an interview by phone.
5. Know name and position of person; be neatly dressed, groomed, and on time; be honest during

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interview; know about the company and its products.
6. Thank interviewer, call company after 10 days, apply to other companies, learn from each interview.

UNIT 4

1. Develop safe work habits.
2. neat, tidy, safely dressed; development of personal safety for self and others; thinks and works safely
3. plain safety glasses, plastic safety goggles, face shields
4. Roll sleeves above elbow; wear hard, smooth material; tuck in or remove necktie; tie apron strings at back.
5. can be caught in machinery
6. hair net or approved shop cap
7. can be caught in machinery
8. prevent dangerous falls
9. Flying chips can injure someone; chips wedged between machine parts cause wear.
10. Safety devices should be in place, know how to stop machine, cutting tool and workpiece should be properly mounted.
11. Assume squatting position; grasp workpiece firmly; straighten legs, keeping back straight.
12. Get first aid.
13. Place oily rags in proper containers, know how to operate fire extinguisher, know location of nearest fire exit.

UNIT 5

1. with symbols, dimension lines and sizes, word notes
2. (a) shows complete product
   (b) shows part or component
3. shows three sides of a part
4. show interior forms
5. (a) object lines
   (b) center lines
   (c) cross-section lines
6. (a) largest and smallest permissible dimension
   (b) permissible variation of size
   (c) intentional difference in sizes of mating parts
7. 1:2
8. 60 microinch, 0.003 waviness height, 0.002 roughness width
9. (a) counterbore
   (b) harden
   (c) millimeter
   (d) thread
   (e) total indicated run-out

UNIT 6

1. Work may bend.
2. within .03 in. (0.79 mm)
3. to prevent accumulative errors
4. to ensure accurate measurements
5. to prevent bending due to knurling pressure
6. to allow part to be held in chuck
7. 3.0 in. (76 mm)
8. little deeper than major thread diameter
9. soft metal between jaws and work
10. .010 in. (0.25 mm)
11. .03 in. (0.79 mm)
12. largest surface

UNIT 7

1. inch, metric
2. millimeter
3. millimeters; half-millimeters
4. spring tempered, flexible, narrow, hook
5. One side is divided into eighths and sixteenths. The other side is divided into thirty-seconds and sixty-fourths.
6. (a) measurements from shoulder, step, or edge
   (b) measurements smaller than .02 in. (0.39 mm)
7. spring joint, firm joint
8. Set caliper legs parallel to rule, adjust until lower leg splits graduation line.
9. Caliper slides over work by own weight.
10. Set one leg at bottom, set caliper legs parallel to hole, adjust top leg until slight drag is felt.
11. Set one leg of caliper on micrometer anvil, rock top leg over spindle face, adjust micrometer until slight drag is felt.

UNIT 8

1. solid: inspection and setup; adjustable: layout work, check square, depth gage
2. more accurate, line contact
3. Clean surface plate and square end, rotate square on surface plate, make line contact with work.
4. Check die clearance angles.
5. Diemaker: Turn blade-adjusting screw until blade contacts work, measure angle with protractor. Direct Reading: Turn micrometer head until blade contacts work, read out-of-squareness on micrometer head.
6. reference plane for layout
7. gray, pink, black
8. not affected by temperature; will not burr; is nonmagnetic; is rustproof; abrasives will not embed
9. Clean at all times, clean occasionally with solvent, protect with wooden cover, use parallels under work, remove burrs from work, slide heavy parts on plate, oil cast-iron plates, no center or prick punching.

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UNIT 9

1. 40
2. (a) .025
   (b) .100
   (c) .001
3. (a) .136
   (b) .111
   (c) .201
   (d) .898
4. vernier scale on sleeve, 10 divisions parallel to index line, each division equals .0001 in.
5. Read as standard micrometer, note line on vernier scale that coincides with thimble line, add number of vernier line in .0001 to micrometer reading.
6. (a) .5331
   (b) .2594
   (c) .4838
   (d) .3000
7. (a) Open thimble fully, insert C-spanner into adjusting nut slot, turn clockwise until play eliminated.
   (b) Clean measuring faces, close measuring faces with friction or ratchet stop thimble, insert C-spanner into hole in sleeve, adjust until index line matches zero line on thimble.
8. spindle screw pitch, sleeve and thimble graduations
9. (a) 1 mm
   (b) ½ (0.5) mm
   (c) 0.01 mm
10. (a) 3.68 mm
    (b) 6.75 mm
    (c) 7.92 mm
    (d) 3.17 mm
11. comparator, arms for setting tolerance
12. pointed spindle, double-V swivel anvil
13. pitch diameter
14. 8 to 13 TPI; 14 to 20 TPI; 22 to 30 TPI; 32 to 40 TPI
15. Set micrometer to thread plug gage, measure work and compare readings.

UNIT 10

1. (a) 25 vernier scale divisions equal 24 bar divisions; difference equals .001 in.
   (b) 50 vernier scale divisions equal to 49 bar divisions; difference equals .001 in.
2. Large bar before sliding jaw represents 1.000s. Small number between sliding jaw and large number represents .100s. Match vernier scale line with bar line; add this in .001s to reading.
3. (a) 1.361
   (b) 1.564
   (c) 1.066
   (d) 4.225
4. Each numbered scale division equals 10 mm; each scale division equals 1 mm; each vernier scale division equals 0.02 mm.
5. (a) 48.44
   (b) 34.56

UNIT 11

1. inside micrometer caliper (barrel and thimble readings reversed)
2. Move jaw back and forth when setting; set lock nut before removing from hole.
3. thimble nut tighter on spindle thread
4. Clean shoulder on rod and micrometer.
5. slight drag when rod moved past hole centerline
6. Ball end: measure holes, slots, grooves; Flat end: measure shallow slots, recesses
7. feel must be same when setting and transferring measurement
8. Insert into hole with plungers depressed, hold in vertical position and loosen knurled knob, light tension on gage and hold bottom leg in position, move top plunger past hole centerline, tighten knurled knob and recheck gage feel, check size with micrometer.
9. out-of-round, taper, bell-mouth, hour-glass, barrel shape
10. nut on end of extension rod
11. Remove burrs from work surface; clean work and base of micrometer.
12. Hold micrometer firmly against work; rotate thimble with one finger until rod touches bottom of surface; recheck setting a few times to ensure accuracy; read micrometer.
13. Thimble and sleeve numbers are reversed.
14. layout and inspection
15. depth gage attachment, dial indicator
16. quick and accurate; eliminates gage block buildup
17. ½ plug diameter

UNIT 12

1. alternate cycles of extreme heat and cold
2. to check fixed gages; calibrate adjustable gages; set comparators, height gages; set sine bars; measure and inspect parts
3. to prevent wear on gage blocks
4. at each end of buildup
5. master: accurate to ±.0000002 in.; working: accurate to ±.0000008 in.
6. Hold as little as possible; use insulated tweezers.
7. Keep in closed case; do not handle unnecessarily; do not drop; clean faces before wringing together; never leave buildup together too long.
8. (a) 2.1743 in.

   .1003 .1003

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2.074
.124 .124
1.950 .950
.950 1.000
1.000 2.1743 (proof)

(b) 6.2937 in.
.1007 .1007
6.193
.143 .143
6.050
.450 .450
5.600
.600 .600
5.000 3.000
3.000 2.000
2.000 6.2937 (proof)

(c) 7.8923 in.
.1003 .1003
7.792
.142 .142
7.650
.650 .650
7.000 4.000
4.000 3.000
3.000 7.8923 (proof)

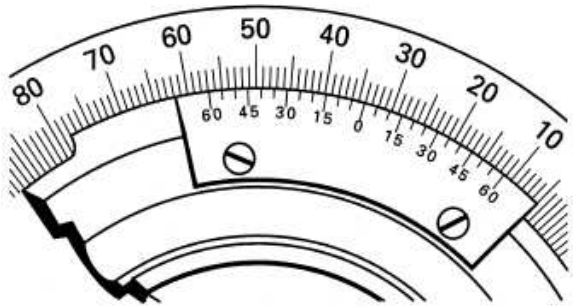
(d) 32.079 mm
1.009 1.009
31.07 1.07
1.07 30.00
30.00 32.079 (proof)

(e) 74.213 mm
1.003 1.003
73.21
1.21 1.21
72.00 2.00
2.00 70.00
70.00 74.213 (proof)

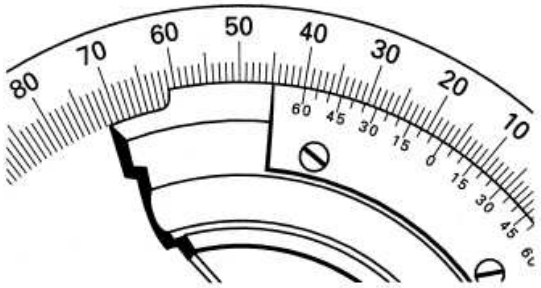
(f) 89.694 mm
1.004 1.004
88.69
1.19 1.19
87.50 7.50
7.50 80.00
80.00 89.694 (proof)

UNIT 13

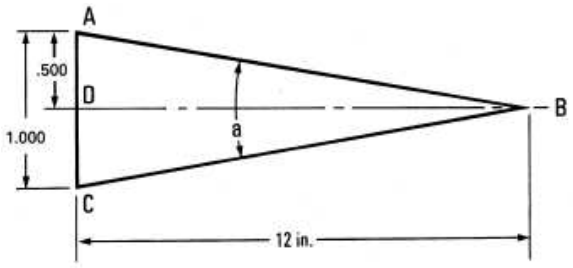
1. protractor dial: graduated in degrees; sliding blade: measure angles
2. protractor dial divided into two arcs of 180°; vernier scale 12 divisions on each side of 0; each vernier scale division equals 5'
3. (a)



(b)



4. steel bar, two cylinders on each end; 5 in. distance between cylinders
5. 5 in.: ±.0002;
   10 in.: ±.00025
6. (a) .66705 in.
   (b) 2.1787 in.
   (c) 3.2250 in.
7. Calculate for complementary angle (18°); more accurate.
8. not a right-angle triangle



9. wider than sine bar; set up larger workpieces
10. tilt from 0° to 60°
11. setting compound angles

UNIT 14

1. (a) 1.750; 1.752; 1.750; .002
   (b) .625; .6265; .625; .0015
   (c) 12.50; 12.52; 12.48; .04
   (d) 20.500; 20.500; 20.485; .015
   (e) .500; .505; .495; .010
2. (a) unilateral
   (b) unilateral
   (c) bilateral

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ANSWER KEY TO *WORKBOOK FOR TECHNOLOGY OF MACHINE TOOLS*, NINTH EDITION

TEST 1 (20 answers)

1. safe
2. fellow
3. side
4. knees; straight; leg
5. stopped
6. power; switch
7. devices; place
8. T
9. T
10. F
11. T
12. F
13. T
14. F
15. T
16. F

TEST 2 (20 answers)

1. three
2. two
3. largest; smallest
4. tolerance
5. allowance
6. sectional
7. object
8. hidden
9. center
10. dimension
11. copper (brass)
12. aluminum
13. steel
14. cast iron
15. radius
16. countersink
17. diameter
18. harden
19. millimeter

TEST 3 (20 answers)

1. .03 in.
2. largest; smallest
3. .03 in.
4. end
5. friction
6. short
7. three
8. steady; center
9. major
10. soft
11. incorrect
12. center
13. longer
14. C
15. D
16. B
17. C
18. B

TEST 4 (20 answers)

1. T
2. T
3. F
4. T
5. F
6. F
7. T
8. T
9. T
10. F
11. $^{15}/_{16}$ in.; $1\,^{11}/_{32}$ in.; $^{49}/_{64}$ in.; $1\,^{11}/_{32}$ in.; 0.32 mm
12. .02 in.; .03 in.; .06 in.; .12 in.
13. .010 in.

TEST 5 (20 answers)

1. ground; preserve
2. solid; adjustable
3. beveled; line
4. Light
5. paper; blade
6. deflection
7. close; wear
8. pink; black
9. lapping
10. C
11. A
12. C
13. B
14. C

TEST 6 (30 answers)

1. C
2. A
3. B
4. A
5. C
6. C
7. C
8. B
9. A
10. faces; ratchet (friction thimble)
11. comparator
12. graduations
13. 50
14. 0.5
15. fifth
16. direct-reading; digital
17. indicating; anvil
18. statistical-process
19. .037 in.
20. .201 in.
21. .898 in.
22. .2499 in.
23. .2000 in.
24. .3142 in.
25. 3.85 mm
26. 15.05 mm
27. 14.26 mm

TEST 7 (25 answers)

1. main scale graduations
2. fixed jaw
3. movable jaw
4. vernier scale
5. adjusting nut
6. clamp screws
7. C
8. D
9. A
10. A
11. A
12. C
13. A
14. 1.001 in.
15. 3.066 in.
16. .702 in.
17. .322 in.
18. 4.602 in.
19. 1.318 in.
20. 5.995 in.
21. .013 in.
22. 20.60 mm
23. 18.26 mm
24. 6.72 mm
25. 14.52 mm

TEST 8 (20 answers)

1. F
2. T
3. F
4. T
5. T
6. T
7. F
8. F
9. T
10. F
11. F
12. F
13. inside micrometer caliper
14. telescope gages
15. small hole gages
16. vernier caliper
17. inside micrometer
18. depth micrometer
19. dial bore gage
20. Intrimik

TEST 9 (20 answers)

1. 9 in.; extension
2. burrs
3. clockwise; finger
4. nut
5. .001 in.
6. scriber
7. surface; plate
8. .001 in.
9. gage
10. reference
11. 1.000 in.
12. 1.000 in.
13. riser
14. .265 in.
15. .300 in.
16. .642 in.
17. .412 in.

TEST 10 (25 answers)

1. C
2. D
3. C
4. B
5. B
6. C
7. C
8. B
9. C
10. C
11. F
12. T
13. T
14. F
15. F
16. F
17. T
18. F
19. interchangeable
20. stabilized
21. 68
22. accuracy

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