1. Tools that are of good quality are ____ than "bargain" tools.
   a. stronger
   b. lighter
   c. more dependable
   d. easier to use
   e. All of the above.

2. A wrench that completely surrounds the bolt head or nut is called a(n) ____ wrench.
   a. adjustable
   b. open end
   c. box end
   d. pipe

3. The ____ punch is used to make a small indentation in metal before drilling a hole.
   a. center
   b. drift
   c. pin
   d. aligning

4. Technician A says that the chassis of an automobile typically includes everything but the body. Technician B says that the chassis is just another name for the vehicle's body. Who is right?
   a. A only.
   b. B only.
   c. Both A and B.
   d. Neither A nor B.

5. An automotive ____ is a group of related parts that perform a specific job.
   a. system
   b. sequence
   c. component
   d. process

6. The engines that are used in most automobiles are ____ engines.
   a. multi-cylinder
   b. four-stroke cycle
   c. piston
   d. All of the above.
   e. None of the above.

7. The radiator of a vehicle is part of its ____ system.
   a. lubrication
   b. cooling
   c. electrical
   d. fuel

8. Power for tools used in the automotive shop is provided by ____.
   a. compressed air
   b. hydraulics
   c. electricity
   d. Only A and C.
   e. All of the above.

9. Which of the following are used to support a vehicle after it has been raised?
   a. Floor jacks.
   b. Jack stands.
   c. Transmission jacks.
10. A cutting torch generates tremendous heat by burning ____ and acetylene gas.
   a. oxygen
   b. propane
   c. nitrogen
   d. hydrogen

11. Approximately how many people are employed in the automotive field?
   a. 9 million.
   b. 14 million.
   c. 18 million.
   d. 25 million.

12. A technician who is an expert in one area of automotive repair is called a(n) ____.
   a. expert technician
   b. technical consultant
   c. component specialist
   d. specialized technician

13. The initials ASE stand for ____.
   a. Automotive Service Excellence
   b. Auto Specialist Evaluator
   c. Automotive Service Education
   d. Auto Specification Equipment

14. How many ASE tests must be passed to qualify for certified master automobile technician status?
   a. 3
   b. 5
   c. 8
   d. 16

15. Which of these specialized technicians would be most likely to use computerized test equipment?
   a. Driveability and performance technician.
   b. Brake technician.
   c. Suspension and steering technician.
   d. Heating and air conditioning technician.

16. Which of the following is not one of the safety rules that apply when working with gasoline?
   a. Always use approved containers for storage.
   b. Soak up any spills with an oil absorbent.
   c. Keep any source of heat away from the fuel system.
   d. Disconnect the vehicle's battery before starting work.

17. Which of the items listed below is not a potential explosion hazard?
   a. Battery.
   b. Empty fuel tank.
   c. Oil pan.
   d. Welding gas cylinders.

18. An air bag is being replaced in a vehicle. Technician A says that the bag should be carried with the metal housing pointing downward. Technician B says the metal housing should be pointed away from your body. Who is right?
   a. A only.
   b. B only.
   c. Both A and B
   d. Neither A nor B
19. Technician A says that metric fasteners are used in vehicles assembled outside the United States. Technician B says many cars assembled in the United States use metric fasteners. Who is right?
   a. A only.
   b. B only.
   c. Both A and B.
   d. Neither A nor B.

20. Subtraction is taking away a certain quantity from another. The amount that is left after subtraction is done is called the ____.
   a. product.
   b. remainder.
   c. subtrahend.
   d. sum.

21. The tool used to measure small clearances or gaps between parts is called a(n) ____.
   a. vernier caliper
   b. feeler gauge
   c. ruler
   d. hole gauge

22. Decimal fractions are used for making ____ measurements.
   a. approximate
   b. large
   c. angular
   d. fine

23. What types of diagrams are typically found in service manuals?
   a. Wiring diagrams.
   b. Vacuum diagrams.
   c. Hydraulic diagrams.
   d. All of the above.

24. Which of the following statements about a series circuit is true?
   a. It has only one path for current flow.
   b. It can have only one load connected at a time.
   c. It offers several paths for current flow.
   d. It will keep conducting even if interrupted.

25. Which basic element of electricity is also described as "electrical pressure?"
   b. Capacitance.
   c. Resistance.
   d. Voltage.

26. In a(n) ____, the vehicle's frame or body serves as an electrical conductor.
   a. parallel circuit
   b. one-wire circuit
   c. series-parallel circuit
   d. series circuit

27. Technician A says that an electrical short circuit causes excess current flow. Technician B says a short causes excess resistance to develop. Who is right?
   a. A only.
   b. B only.
   c. Both A and B.
   d. Neither A nor B.

28. To protect an electrical circuit from damage by a "short," a device called a(n) ____ is installed.
a. diode
b. capacitor
c. fuse
d. relay

29. Which of the following is not a type of thread used on nuts and bolts?
   a. Coarse.
   b. Metric.
   c. Medium.
   d. Fine.

30. A soft, flexible material that is placed between parts to prevent leakage is called a(n) ____.
   a. gasket
   b. frisket
   c. barrier
   d. All of the above.

31. A large repair facility recycles its used motor oil. Technician A says that only about one quart of high-quality oil can be recovered from each gallon of used oil that is recycled. Technician B says the recovery rate is much higher—about two and one-half quarts per gallon. Who is right?
   a. A only.
   b. B only.
   c. Both A and B.
   d. Neither A nor B.

32. When checking hose conditions, which would indicate the need for replacement?
   a. Softening.
   b. Glazing.
   c. Hardening.
   d. Cracks or abrasions.
   e. All except B.

33. If you find fluid dripping from a vehicle, where is the likeliest direction to look for the actual leak?
   a. Directly above the drip point.
   b. Above and behind the drip point.
   c. Above and in front of the drip point.
   d. Immediately to the left or right of the drip point.

34. In a typical gasoline-powered automobile engine, how many piston strokes make up a complete cycle?
   a. 1
   b. 2
   c. 3
   d. 4

35. ____ is another name used to describe the engine bottom end.
   a. Short block
   b. Cylinder block
   c. Crank end
   d. Lower deck

36. The piston is mounted to the connecting rod by the ____.
   a. cylinder bolt
   b. piston skirt
   c. wrist pin
   d. cam lobe

37. A timing belt, gears, or a chain drives the engine's camshaft at ____ the rotation speed of the crankshaft.
   a. one-fourth
b. one-half

c. three-fourths

d. twice

38. Pistons typically use ____ compression rings and one oil ring.
   a. 2
   b. 3
   c. 4
   d. 1 to 3

39. Which of the following is not part of a simple battery cell?
   a. Electrolyte.
   b. Negative plate.
   c. Container.
   d. **Neutral plate.**
   e. Positive plate.

40. The insulating elements positioned between battery plates are known as ____.
   a. inert plates
   b. **Separators**
   c. insulating grids
   d. partitions

41. A hydrometer is used to check the ____ of battery electrolyte.
   a. voltage output
   b. level
   c. **specific gravity**
   d. current draw

42. Technician A says that a specific gravity reading of 1.265 indicates that a battery is in need of recharging. Technician B says that a specific gravity reading of 1.265 indicates that the battery is fully charged. Who is correct?
   a. A only.
   b. B only.
   c. Both A and B.
   d. Neither A nor B.

43. Each of the following is a basic part of the starting system, except:
   a. Solenoid.
   b. **Inverter.**
   c. Ignition switch.
   d. Starting motor.
   e. Battery.

44. Which of the following terms describes a starter solenoid?
   a. Rectified contactor.
   b. **High-current relay.**
   c. Amplitude-modulated diode.
   d. Shunt-wound motor.

45. The starter pinion gear engages the ____ to "crank" the engine.
   a. harmonic balancer
   b. cam gear
   c. **Flywheel gear**
   d. crankshaft pulley

46. A(n) ____ uses an extra set of gears and an overrunning clutch assembly to provide greater starting torque.
   a. **Reduction starter**
b. high-torque starter
c. pinion/idler starter
d. geared starter

47. To prevent an engine from cranking while the vehicle is in gear, a(n) ____ is commonly used.
   a. selector safety switch
   b. lockout actuator
   c. neutral safety switch
   d. shift interlock unit

48. To be usable in an automotive electrical system, the AC output of the alternator must be ____ into DC.
   a. biased
   b. relayed
   c. stratified
   d. rectified

49. To properly charge the vehicle battery, alternator output is typically ____ volts.
   a. less than 12
   b. 13-15
   c. 16-20
   d. more than 20

50. The turn signal flasher consists of ____.
   a. a bimetal strip and heating element
   b. a trigger wheel and sensor
   c. a make/break contact and trembler switch
   d. a stepping relay

51. The most common type of windshield washer pump in new cars is a(n) ____ pump.
   a. centrifugal
   b. reciprocating
   c. rotary
   d. diaphragm

52. A halogen headlamp has a light output about ____ higher than a conventional sealed beam headlight, with no increase in current draw.
   a. 10 percent
   b. 25 percent
   c. 35 percent
   d. 50 percent

53. To reduce radio static, a(n) ____ called a noise suppressor is often used.
   a. resistor
   b. chip
   c. transformer
   d. capacitor

54. Which type of tire has the most stable footprint?
   a. Bias ply.
   b. Belted bias ply.
   c. Radial ply.

55. In a P-metric tire size designation, what do the last two digits represent?
   a. Load/size relationship.
   b. Rim or wheel diameter.
   c. Section width.
   d. Construction type.
   e. Height-to-width ratio.
56. The relationship of tire height to its width is called its ____.
   a. aspect ratio
   b. sidewall/tread ratio
   c. width percentage
   d. cross-sectional mass

57. The two sections of a standard wheel are the rim and the ____.
   a. hub
   b. spider
   c. disc
   d. center

58. Which of the following is an example of road damage to a tire?
   a. Puncture.
   b. Feathering.
   c. Sidewall bulge.
   d. Cupping.

59. Each of the following is a possible cause of tire vibration, except:
   a. ply separation.
   b. low inflation pressure.
   c. tire cupping.
   d. excessive tire runout.

60. If wheel lateral runout exceeds ____, it should normally be replaced.
    a. 0.030 in.
    b. 0.045 in.
    c. 0.050 in.
    d. 0.065 in.

61. Abnormal wear patterns can identify tire problems. Which pattern indicates that the tire was consistently underinflated?
    a. Wear along outer tread area.
    b. Wear along the centerline.
    c. Wear along one edge.
    d. Feathering of tread rubber.

62. Cold inflation pressure of a tire should be ____ the maximum.
    a. 5 psi below
    b. exactly on
    c. 1-3 psi below
    d. 1-3 psi above

63. Which of the following is not a true statement regarding a hydraulic system?
    a. Liquids in a confined area will not compress.
    b. When pressure is applied in a closed system, it is exerted equally in all directions.
    c. Air in a confined area will not compress.
    d. A hydraulic system can be used to increase or decrease force or motion.

64. Which of the following is a desirable characteristics for a brake fluid?
    a. High freezing point.
    b. Water tolerance.
    c. High volatility.
    d. None of the above.

65. Blowing dust off a brake assembly shouldn't be done because the dust may contain cancer-causing ____.
    a. beryllium
    b. asbestos
c. manganese
d. asphaltum

66. Brake system hydraulic parts should be cleaned only with ____.
   a. brake fluid
   b. soap and water
   c. parts cleaner
   d. gasoline

67. Linings for drum brakes should be replaced if they are worn to a thickness of ____ in. or less.
   a. 1/64
   b. 1/32
   c. 1/16
   d. 1/8

68. The distance from the floor to the pedal with the brake applied is called the ____.
   a. pedal height
   b. free play distance
   c. adjustment range
   d. reserve distance

True/False
Indicate whether the sentence or statement is true or false.

69. A magnetic pickup will attract any kind of metal.

70. Proper filing speed is about one stroke per second.

71. If the head of a chisel or punch becomes "mushroomed," the tool must be discarded.

72. "Dead blow hammer" is another name for the rubber mallet.

73. An adjustable wrench should be used only when other types of wrenches will not fit.

74. The 6-point box end wrench should be used when a bolt head or nut is extremely tight.

75. The brake system uses friction to stop the vehicle.

76. Piston rings are used to keep combustion pressure and oil from leaking between the piston and the cylinder wall.

77. Opening of the engine's valves is controlled by the crankshaft.

78. Force is transmitted from the engine to the vehicle's wheels by the drive train.

79. All internal combustion engines use spark plugs to ignite the air-fuel mixture.

80. The air conditioner is part of the vehicle's cooling system.

81. For safety, battery charger leads must be connected to the battery before the charger is turned on.

82. An arbor press exerts less pressure than a hydraulic press.

83. A wire wheel in a bench grinder should not be used to clean soft metal or brass parts.

84. Shop air pressure is seldom higher than 50 psi.

85. Air-powered tools should always be lubricated before use.

86. It is unsafe to work under a vehicle supported only by a jack.
87. Carbon steel is better than high-speed steel for drill bits.
88. The service manager reports to the shop supervisor in most repair organizations.
89. In cooperative training programs, students usually earn school credit but not wages while working in a repair facility.
90. An apprentice mechanic learns "on the job" from an experienced technician.
91. An entrepreneur is someone who is just learning a trade.
92. Electrical system technician is an automotive specialty that requires less physical strength than the other specialties.
93. There are many automotive careers that do not require a great deal of mechanical ability.
94. A technician can gain ASE certification in more than one specialty area.
95. An experienced and skilled auto technician is capable of performing tasks common to a number of other trades.
96. Once a transmission technician learns "the basics," he or she seldom needs additional specialized training.
97. When taking a certification test, your first thought about which answer is correct is usually the correct response.
98. Asphyxiation is caused by breathing toxic substances in the air.
99. Accidents seldom result from breaking safety rules.
100. The safety catch on a hydraulic lift must be engaged before you work under the vehicle.
101. You should always have your instructor demonstrate potentially dangerous equipment before you try to use it.
102. There are only three basic kinds of accidents -- fires, electrical shock, and physical injuries -- that are likely to happen in an auto repair shop.
103. Always pull vehicles through shop doors slowly and carefully to make sure they will clear the bottom of the raised door.
104. If you use power tools carefully, wearing eye protection usually is not necessary.
105. Dust from brake shoes should be blown off parts with compressed air.
106. An electric-powered tool should never be used unless the plug has a functional ground prong.
107. The tool used to measure very small part movements is a dial indicator.
108. A metric micrometer is graduated to provide readings in tenths of inches.
109. The customary measurement system is the most widely used, especially outside the United States.
110. For measurements smaller than 1/64 inch, fractions are the easiest, most accurate unit to use.
111. Illustrations are an essential part of a service manual.
112. A tree diagnosis chart provides a logical sequence for inspecting or testing components.
113. An owner's manual usually contains only basic information on operating and maintaining a vehicle.
114. The VIN is usually found on the dashboard.
115. A service manual is one of the technician's most important tools.
116. Printed circuits are most often used in instrument panels of vehicles.
117. "Secondary wire" refers to all vehicle circuits that are not part of the ignition system.
118. An ammeter is a device for directly measuring the resistance of a circuit.
119. When electrical current passes through a wire, a magnetic field is generated.
120. According to Ohm's Law, current flows from positive to negative.
121. Sealer must always be used when installing a gasket.
122. A seal is used to prevent leakage between a stationary part and a moving part.
123. The only way to remove a broken bolt is to "drill it out."
124. When tapping aluminum to accept a fastener, use a fine thread for better holding power.
125. In automotive work, bolts and nuts are often named after the parts they hold.
126. A key fits into a slot cut in a shaft and a mating part, and keeps the part from turning on the shaft.
127. When installing a gasket, all fasteners should be hand-tightened before a wrench is applied.
128. An O-ring seal should never be exposed to oil or other engine fluids.
129. A long screwdriver can be used like a stethoscope to listen to engine sounds.
130. If certain fluids are not changed at recommended intervals, they can cause damage to vehicle systems.
131. A filter wrench should be used to "snug up" the filter after an oil change.
132. Transmission fluid should be checked with the engine warmed up and running and the gear selector in "Park."
133. If examination reveals rusty engine coolant, the system should be drained and filled with new coolant.
134. Most batteries today do not require periodic refilling with electrolyte.
135. Vehicle door locks should be oiled periodically for smooth operation.
136. The combustion chamber is located directly above the piston.
137. In a four-stroke cycle engine, the crankshaft must make four complete rotations to complete the cycle.
138. The crankcase is the upper part of the engine block, where the valves are located.
139. An intake valve is usually smaller than an exhaust valve.
140. A crank damper helps prevent crankshaft vibration.
141. Explosive hydrogen gas can be produced by a battery.
142. The chemically active material on a battery's negative plates is lead peroxide.
143. Electrolyte is a mixture of sulphuric acid and water.
144. The red battery cable is usually grounded on the engine block.
145. Each battery cell produces approximately 2.0 volts.
146. Two 12-volt batteries connected in parallel will produce an output of 12 volts.
147. A cold cranking rating indicates how low a temperature a battery can operate in.
148. Most modern automobiles can use 6-volt batteries.
149. Cell voltage readings that vary by more than 0.2 volts indicate that the battery should be replaced.

150. When jump-starting a car, the red jumper cable should connect positive terminals of the two batteries.

151. Quick charging is the preferred method for recharging an automotive battery.

152. A specific gravity reading of 1.175 indicates that the battery is fully charged.

153. A battery load test is one of the most accurate way of determining battery condition.

154. A small wire brush is the best tool for cleaning battery terminals.

155. As a battery becomes discharged, the percentage of water in its electrolyte increases.

156. A dirty battery top can permit current leakage across its surface.

157. A series-wound motor will develop maximum torque at start-up.

158. The starter relay allows a smaller current flow (from the ignition switch) to control a larger current flow (to the starter solenoid).

159. A magnetic field is generated around a wire that carries electrical current.

160. The rotating starter armature generates a strong magnetic field in the field windings of the motor.

161. A solenoid plunger moves when electric current is supplied to the coil surrounding it.

162. An electronic voltage regulator cannot be repaired.

163. An alternator fan cools windings and diodes to prevent overheating and damage.

164. All vehicles today use an alternator, rather than a DC generator, to supply current.

165. A diode that is forward-biased will act as an insulator, blocking current flow.

166. A fully charged battery will produce a voltage reading of 12.6 volts.

167. The alternator pulley is usually brazed onto the end of the rotor shaft.

168. To reduce output of the alternator, the electronic voltage regulator introduces more resistance between the rotor windings and battery.

169. The sound emitted by a vehicle horn is usually made by a rapidly vibrating diaphragm.

170. An open circuit results when a hot wire touches ground.

171. A dimmer switch allows the driver to vary the brightness of daylight running lights.

172. Windshield wiper motors must normally be replaced, rather than repaired.

173. When there is no power at the fuse panel, a fusible link in the circuit is probably burned out.

174. The voltage drop across a bulb or electric motor should not exceed .5 volts.

175. Headlight high and low beam selection is made with a dimmer switch.

176. A varying magnetic field causes speakers to reproduce sound.

177. A radio signal that varies in frequency is called an AM signal.

178. Automotive CD players may be mounted in the trunk of the vehicle.

179. Power seats usually use more than one electric motor.

180. An inoperative power window can sometimes be caused by stripped window motor transmission gears.
181. Seat belt reminder systems usually use an audible warning signal.

182. The speed control servo on a cruise control system opens and closes the vehicle's throttle as needed to maintain speed.

183. A heated windshield system has current flow high enough to cause a serious electric shock.

184. Driving wheels and nondriving wheels have different wheel bearing and hub designs.

185. Wheel lugs and nuts usually have left-hand threads.

186. On a nondriving wheel assembly, the wheel and hub spin freely on the spindle.

187. A wheel with a safety rim has small ridges to hold the tire bead in place if a blow-out occurs.

188. An air chuck is the spring-loaded valve threaded into a tire's valve stem.

189. The drop center style of wheel is most common on passenger vehicles.

190. The primary purpose of a wheel cover is appearance.

191. A thumping sound while driving usually indicates a tire problem.

192. Wheel lug nuts should be tightened in order, moving clockwise.

193. Static imbalance will cause a tire to both hop and shimmy.

194. When pressing a wheel bearing in or out, force applied to the wrong race could damage the bearing.

195. A longitudinally split brake system uses one master cylinder to operate the brakes on the left side of the vehicle and the other cylinder to operate brakes on the right.

196. Equalizing braking action at each wheel is the primary function of the brake system metering valve.

197. Automotive disk brake pad linings no longer use asbestos as a friction material.

198. Dual master cylinders are being replaced on newer cars by more efficient single cylinder units.

199. The compensating port acts to help keep the brake system full of fluid.

200. When a small piston acts on a larger piston, the larger piston will move with more force, but will travel a shorter distance.

201. The power booster in a power braking system is usually located between the master cylinder and the wheel cylinders.

202. Brake lines are usually made of double-wall steel tubing.

203. A master cylinder must be bench bled before being installed in the vehicle.

204. A wheel cylinder rebuild normally involves honing the cylinder and installing new cups.

205. On a drum brake, the larger secondary lining faces the front of the vehicle.

206. A warped brake disc can cause severe vibration when the brakes are applied.

207. With a car that has power brakes, the engine must be running to check brake pedal action.

208. Brake system flushing uses air pressure and new fluid to bleed out old, contaminated fluid.

Matching
Match the following terms and identifying phrases.

____ 209. Squeezes trapped fuel mixture. compression stroke
____ 210. Removes burned gases from engine. exhaust stroke
____ 211. Draws air-fuel mixture into combustion chamber. intake stroke
____ 212. Produces energy to operate engine. power stroke

Match the following terms and identifying phrases.

____ 213. Unit of resistance. ohm
____ 214. Multimeter. VOM
____ 215. Unit of current flow. amp
____ 216. Integrated circuit. chip
____ 217. Unit of voltage. volt

Match the following terms and identifying phrases.

____ 218. All-around body lubricant. chassis grease
____ 219. Generally checked by looking at the side of the overflow tank. engine coolant
____ 220. Checked with a dipstick. engine oil
____ 221. Check level at least twice a year. brake fluid
____ 222. Used on door latches and strikers. dry stick lubricant

Match the following terms and identifying phrases.

____ 223. Highest point of piston travel. TDC
____ 224. Caused by ignition of air-fuel mixture. power stroke
____ 225. Clears burned gases from cylinder. exhaust stroke
____ 226. Results in 180° rotation of crankshaft. piston stroke
____ 227. Lowest point of piston travel. BDC

Match the following terms and identifying phrases.

____ 228. Assembly that spins inside stationary field. armature
____ 229. End housing around pinion gear. drive end frame
____ 230. Incorporates overrunning clutch, pinion gear, and sometimes a solenoid and shift lever. pinion drive assembly
____ 231. Center housing that holds coils and shoes. field frame
____ 232. End housing for brushes, brush springs, and shaft bushing. commutator end frame