MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) __________
   A)                     B)                     C)                     D)                     
2) The part of the tire that is just under the tread of a radial tire is called the ________.
   A) Inner liner       B) Belt
   C) Bead             D) Body (carcass) ply
3) A tire with lower than specified inflation pressure could lead to what condition?
   A) Increased chances of roadside faults or accidents
   B) Reduced fuel economy
   C) Reduced tire life
   D) All of the above
4) A tire is worn excessively on both edges. The most likely cause of this type of tire wear is ________.
   A) Excessive axial runout
   B) Excessive radial runout
   C) Underinflation
   D) Overinflation
5) The spring rate of a spring is measured in units of ________.
   A) lb. per inch       B) in.-lb.
   C) PSI                D) ft.-lb.
6) Unusual noise during a test drive can be caused by ________.
   A) Defective or worn control arm bushings or ball joints
   B) Worn or defective CV joints
   C) Defective wheel bearings or stabilizer bar links
   D) All of the above
7) A vehicle equipped with a coil spring front suspension and a leaf spring rear suspension “dog tracks” while driving on a straight, level road. Technician A says that a broken center bolt could be the cause. Technician B says defective rear shock absorbers could be the cause. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician
8) The circuit to the airbag inflation module is connected from the steering column to the steering wheel through which component?
   A) Clockspring (coil)
   B) Slip ring and carbon brushes
   C) Magnetic field sensor
   D) Hall-effect switch
9) A "dry park" test to determine the condition of the steering components and joints should be performed with the vehicle _______.
   A) Lifted off the ground about 2 inches
   B) On a frame contact lift with the wheels off the ground
   C) On turn plates that allow the front wheels to move
   D) On level ground or on a drive-on lift

10) Two technicians are discussing the proper procedure for bleeding air from a power steering system. Technician A says that the front wheels of the vehicle should be lifted off the ground before bleeding. Technician B says that the steering wheel should be turned left and right with the engine off during the procedure. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

11) A power steering pressure test is being performed, and the pressure is higher than specifications with the engine running and the steering wheel stationary in the straight ahead position. Technician A says that a restricted high pressure line could be the cause. Technician B says that internal leakage inside the steering gear or rack and pinion unit could be the cause. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

12) When pressure testing a hydraulic assisted power steering system, the highest pressures were greater than 50 PSI of each other. This indicates a problem with _______.
   A) The flow control valve
   B) A defective hose
   C) The pump vanes
   D) The pump rotor

13) Integral power steering gears use _______ for lubrication of the unit.
   A) Chassis grease (NLGI #2)
   B) Molybdenum disulfide
   C) Power steering fluid in the system
   D) SAE 80W–90 gear lube

14) What can cause hard steering on a vehicle equipped with a hydraulic power assisted steering system?
   A) Low tire pressure
   B) Slipping power steering pump drive belt
   C) Low or contaminated power steering fluid
   D) Any of the above

15) High pressure hoses have to be used on the high pressure side of the power steering system because pressures can reach as high as _______.
   A) 200 psi
   B) 750 psi
   C) 2500 psi
   D) 1500 psi

16) Some vehicles are equipped to signal the computer whenever the power steering pressures increase so the idle speed can be increased to prevent stalling during turns at low speeds. What component signals the computer?
   A) Power steering pressure switch
   B) Pressure relief valve
   C) Flow control valve
   D) Rotary Valve
17) What type of motor is used in most electric power steering (EPS) systems?
   A) AC brush type
   B) DC brushless
   C) Stepper
   D) DC capacitor start

18) Electronically controlled variable assist power steering systems vary the amount of boost by
   _______.
   A) Varying the pump output orifice size
   B) Bypassing some of the fluid back into the reservoir
   C) Speeding up or slowing down the power steering pump
   D) Changing the flow of fluid through the steering gear

19) Two technicians are discussing electric power steering systems. Technician A says that some
    systems operate on 12 volts. Technician B says that some systems operate on 42 volts, such as
    on some hybrid electric vehicles. Which technician is correct?
    A) Technician A only
    B) Technician B only
    C) Both technicians
    D) Neither technician

20) All power steering pumps have integral reservoirs.

21) Which of the following represent typical power steering pressures?
    A) over 750 psi when slowly maneuvering a parking lot
    B) about 450 psi when cornering
    C) less than 150 psi when straight ahead
    D) all of the above are correct

22) A power steering pressure switch sends a signal to the powertrain control module, indicating
    higher engine speed is needed during sharp cornering at slow speeds.

23) Technician A says that a leaking pressure relief valve can cause absence of power assist.
    Technician B says that a missing or slipping pump drive belt can cause lack of power assist.
    Which technician is correct?
    A) Technician A only
    B) Technician B only
    C) Both technicians
    D) Neither technician

24) Technician A says that some power assist systems use an external cooler for the power
    steering fluid. Technician B says that the cooler is located in the pressure line, before the
    steering gear box. Which technician is correct?
    A) Technician A only
    B) Technician B only
    C) Both technicians
    D) Neither technician
25) Technician A says that all vehicles from the same manufacturer use the exact same power steering fluid. Technician B says that some fluids may be incompatible with system seals. Which technician is correct?
   A) Technician A only           B) Technician B only
   C) Both technicians           D) Neither technician

26) TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

   A system flush is required when any major power steering repair is performed.
   T/F

27) MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

   Technician A says that lifting the vehicle and turning the steering wheel may help bleed air out of some systems. Technician B says that if this procedure is used, the wheels should be turned from stop to stop. Which technician is correct?
   A) Technician A only           B) Technician B only
   C) Both technicians           D) Neither technician

28) A power steering pressure gauge is being used to diagnose a system problem on a rack and pinion system. When the wheels are turned all the way left, a pressure reading less than specification is found. When the gauge valve is closed, the pressure reading is within specifications. Technician A says that the pump pressure regulator is bad. Technician B says that there is a problem in the rack assembly. Which technician is correct?
   A) Technician A only           B) Technician B only
   C) Both technicians           D) Neither technician

29) What law states that pressure on a confined fluid is transmitted equally in all directions and acts with equal force on equal areas?
   A) Watt's law            B) Pascal's law          C) Martin's law          D) Newton's law

30) Technician A says that one advantage of hydraulics compared to a mechanical linkage is that fluid has no fixed shape. Technician B says that hydraulics offer the opportunity to multiply the input force. Which technician is correct?
   A) Technician A only           B) Technician B only
   C) Both technicians           D) Neither technician

31) Technician A says that the current trend is to use remote power steering fluid reservoirs. Technician B says that using a remote reservoir allows for a more compact power steering pump assembly. Which technician is correct?
   A) Technician A only           B) Technician B only
   C) Both technicians           D) Neither technician

32) How much effort is typically required to turn the steering wheel on vehicles with power steering?
   A) 0.5–1.5 lbs.            B) 5–7 lbs.             C) 2–3.5 lbs.             D) 10 lbs. or more

33) What is the maximum pressure a power steering pump provides during low speed cornering?
   A) 90 psi            B) 1400 psi            C) 500 psi            D) 250 psi
34) Which statement is true regarding the flow control valve on a power steering pump?  
   A) It is located at the pump outlet  
   B) It uses a variable orifice to control pressure  
   C) Both A and B  
   D) Neither A nor B  

35) What is the purpose of the power steering pressure switch?  
   A) To regulate power steering pump pressure  
   B) Increase engine idle during slow cornering to prevent engine stall  
   C) Both A and B  
   D) Neither A nor B  

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.  

36) Some vehicles have a cooler in the return line from the steering gear to the pump.  

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.  

37) Which type of variable effort steering design uses a variable bi-directional magnetic rotary actuator built into the steering rack?  
   A) TFE  
   B) Magnasteer  
   C) SSS  
   D) EVO  

38) What other input(s) do/does the Magnasteer system use to determine the amount of power steering assist needed?  
   A) Wheel speed sensor  
   B) Mass airflow sensor  
   C) Both A and B  
   D) Neither A nor B  

39) The steering torque sensor in an electric power steering system senses ________.  
   A) Steering wheel torque  
   B) Steering wheel direction  
   C) Both A and B  
   D) Neither A nor B  

40) If the steering column of an electric power steering system vehicle is replaced, what may have to be re-learned by the electric power steering control module?  
   A) Torque sensor zero  
   B) Vehicle toe-in  
   C) Turn signal cancel trigger  
   D) Lock-to-lock distance  

41) The electrohydraulic power steering pump provides hydraulic power to the steering gear and ________.  
   A) Hydraulic level control system  
   B) Brake booster  
   C) Valve lifters  
   D) Cooling fan clutch  

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.  

42) A replacement power steering pump usually includes a new pulley.
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

43) Two technicians are discussing bump steer. Technician A says that an unlevel steering linkage can be its cause. Technician B says that if the steering wheel moves when the vehicle is bounded up and down, the steering linkage may be bent. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

44) A vehicle has an excessive amount of freeplay in the steering wheel and it is difficult to keep it traveling straight on a level road. Which is the LEAST likely cause?
   A) Excessive play in the ball socket assemblies
   B) Worn tie rod ends
   C) Worn idler arms
   D) Loose pitman arm retaining nut

45) How are the inner tie rods attached to the rack on a center take–off type rack and pinion steering gear?
   A) Riveted   B) Staked   C) Pinned   D) Bolted

46) What is the MOST likely cause of bump steer?
   A) A lack of proper lubrication of all ball and socket joints
   B) Worn outer tie rod ends
   C) A worn center link
   D) Worn or oil soaked rack bushings

47) How much end play is generally acceptable in tie rod ends?
   A) 0.050 to 0.100 in.   B) 0.0010 to 0.030 in.
   C) Zero   D) 0.030 to 0.050 in.

48) Technician A says that outer tie rod ends should be replaced in pairs, even if only one is worn. Technician B says that inner tie rod ends should be replaced in pairs, even if only one is worn. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

49) Which tool is NOT recommended to be used to separate tapered steering components because it can do harm?
   A) Two hammers   B) Taper breaker
   C) Tie rod removal puller   D) Pickle fork

50) Technician A says that torque prevailing nuts can be reused unless damaged. Technician B says that a new cotter key should always be used. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician
51) New tie rods are being installed. Technician A says to tighten the retaining nuts to specification and then loosen, if needed, to align the cotter pin hole. Technician B says to tighten farther to align the cotter key hole. Which technician is correct?
   A) Technician A only  B) Technician B only
   C) Both technicians  D) Neither technician

52) Technician A says that the pitman arm is connected to the steering gear. Technician B says that an idler arm is used with all rack and pinion steering linkages. Which technician is correct?
   A) Technician A only  B) Technician B only
   C) Both technicians  D) Neither technician

53) Which of the following terms is used to describe the center link?
   A) Connecting link  B) Drag link
   C) Relay rod  D) All of these are correct

54) Which of the following linkages is used with a rack and pinion design?
   A) Parallelogram  B) Haltenberger
   C) Cross steer  D) None of these is correct

55) Technician A says that tie rod ends are used to connect the steering linkage to the steering knuckles. Technician B says that some ball and socket joints are filled with rubber and do not require lubrication. Which technician is correct?
   A) Technician A only  B) Technician B only
   C) Both technicians  D) Neither technician

56) Four wheel steering is being discussed. Technician A says that opposite phase steering is best at high speeds. Technician B says that same phase steering is best at low speeds. Which technician is correct?
   A) Technician A only  B) Technician B only
   C) Both technicians  D) Neither technician

57) Technician A says that steering ball socket joints do not need lubrication. Technician B says that it's a good idea to lubricate steering stops. Which technician is correct?
   A) Technician A only  B) Technician B only
   C) Both technicians  D) Neither technician

58) Technician A says that all steering components have exact specifications to determine replacement. Technician B says that the dry park test is the best way to determine the condition of steering linkage components. Which technician is correct?
   A) Technician A only  B) Technician B only
   C) Both technicians  D) Neither technician

59) The steering wheel in a vehicle moves when the body is bounded up and down. Technician A says that bent steering linkage components could be the cause. Technician B says that this is a normal condition. Which technician is correct?
   A) Technician A only  B) Technician B only
   C) Both technicians  D) Neither technician
60) How much force is generally used to check idler arms?
   A) As much as possible       B) 150 lbs.
   C) 25 lbs.                   D) 5 lbs.

61) What steering component dampens and absorbs sudden motions in the steering linkage?
   A) Drag link              B) Steering dampener
   C) Shock absorber         D) None of these

62) Steering components are connected by _______.
   A) U-joints       B) Rubber bushings
   C) Ball and socket joints D) None of these

63) Technician A says that steering linkages with zerk fittings should be greased at least every six months. Technician B says that some steering linkage joints are sealed and do not require regular service. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

64) Technician A says that RBS type tie rod ends do not require periodic lubrication. Technician B says that the steering gear must be removed to replace outer tie rod ends. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

65) A rack and pinion inner tie rod end is often secured by which of these methods??
   A) Staked       B) Riveted or pinned
   C) Either A or B D) Neither A nor B

66) Technician A says that the inner tie rod end mounts to the end of the rack on all rack and pinion systems. Technician B says that some rack and pinion systems use inner tie rod ends mounted to the center of the rack. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

67) With four wheel steering systems, what term describes the front and rear wheels turning the same direction?
   A) Negative phase mode       B) Opposite phase steering
   C) Same phase steering       D) None of these

68) Which four wheel steering system is best for highway lane changes?
   A) Negative phase mode           B) Same phase steering
   C) Opposite phase steering       D) None of these

69) All of these are Quadrasteer modes EXCEPT _______.
   A) Positive phase steering       B) Negative phase steering
   C) Neutral phase steering        D) All of these are Quadrasteer modes
70) Cross steer linkage is found on _______.
A) Light trucks and vans  B) Sports cars
C) Mid-size sedans  D) None of these

71) The steering linkage shown here is a _______ design.
A) Drop link  B) Parallelogram  C) Cross-steer  D) Haltenberger

72) What type of steering linkage is shown here?
A) Drop link  B) Cross-steer  C) Haltenberger  D) Parallelogram

73) Which part in the steering column allows for changes in the angle between the upper and lower shafts?
A) Column cover  B) Universal joint
C) Collapsible section  D) Flexible coupling

74) The rotation of the steering wheel causes which part to move the actual steering linkage in a conventional steering gear?
A) Sector shaft  B) Pitman arm  C) Worm gear  D) Gear nut

75) The pitman shaft is also called the _______.
A) Input  B) Spline  C) Worm  D) Sector

76) The driver rotates the steering wheel one-half of one revolution on a vehicle equipped with a steering gear with a 20:1 gear ratio. How many degrees will the front tires be rotated?
A) 9 degrees  B) 90 degrees  C) 11.1 degrees  D) 0.1 degrees
77) What causes a variable ratio steering gear to be able to change the ratio as the steering wheel is turned?
A) Changing the length of the teeth on the sector gear
B) Using two or three different sector gears depending on design
C) Changing the number of teeth on the worm gear
D) Using a variable length pitman arm

78) Recirculating steel balls are used in most conventional steering gears because they ________.  
A) Reduce friction
B) Help provide feedback to the driver regarding the road surface
C) Keep the steering wheel centered
D) Provide for a variable ratio

79) Which conventional steering gear adjustment should be the first performed?
A) Tolerance adjustment  
B) Worm bearing preload
C) Gear mesh adjustment  
D) Sector shaft end play

80) The two rack and pinion steering gear adjustments include ________.  
A) Pinion bearing preload and rack support
B) Sector shaft and stub shaft preload
C) Stub shaft endplay and sector shaft preload
D) Worm bearing preload and tolerance adjustment

81) A driver of a vehicle equipped with a rack and pinion steering gear complains that the steering wheel jerks whenever the vehicle is being driven into a curbed driveway. Technician A says that the rack and pinion gears may have too little clearance between the teeth of the gears. Technician B says that a lack of lubrication of the rack and pinion is the most likely cause. Which technician is correct?
A) Technician A only  
B) Technician B only
C) Both technicians  
D) Neither technician

82) Technician A says that the horn is wired in parallel with the horn switch. Technician B says that a relay is commonly used to control horn operation. Which technician is correct?
A) Technician A only  
B) Technician B only
C) Both technicians  
D) Neither technician

83) Which gas is used to fill the airbag during airbag deployment?
A) Sulfur dioxide  
B) Nitrous oxide
C) Hydrogen sulfide  
D) Nitrogen

84) Technician A says that a flexible coupling may be used to connect the steering shaft to the gear input shaft. Technician B says that if the coupling breaks the steering will have a loose feel. Which technician is correct?
A) Technician A only  
B) Technician B only
C) Both technicians  
D) Neither technician
85) Technician A says that federal law requires all new vehicles to be equipped with collapsible steering columns. Technician B says that a hammer should be used to install a steering wheel onto the steering shaft. Which technician is correct?
A) Technician A only  B) Technician B only  
C) Both technicians  D) Neither technician

86) Which component is NOT a safety requirement for steering column systems?
A) Knee bolster  B) Collapsible column  
C) Sector shaft  D) All of these are correct

87) Which component connects to the floor of the passenger compartment to isolate road noise, drafts, and dirt?
A) Stub shaft  B) Breakaway bracket  
C) Toe plate  D) Knee bolster

88) Most steering shafts ride on how many bearings?
A) Six  B) One  C) Three  D) Two

89) Technician A says that the multifunction switch operates the turn signals, windshield wiper and washer switch, and the headlight dimmer switch. Technician B says that the ignition switch is built into the lock cylinder. Which technician is correct?
A) Technician A only  B) Technician B only  
C) Both technicians  D) Neither technician

90) Technician A says that worm bearing preload is also called worm end play. Technician B says that sector lash is also known as gear lash. Which technician is correct?
A) Technician A only  B) Technician B only  
C) Both technicians  D) Neither technician

91) What purpose does the flexible coupling attached to the steering shaft serve?
A) Acts as a collapsible part of the steering shaft  B) Changes direction of movement  
C) Both A and B  D) Neither A nor B

92) What is the name of the flexible coupling that allows two shafts to join and allow plunging?
A) U-joint  B) Plunge joint  C) Pot joint  D) None of these

93) What component helps isolate road forces and vibration from the steering shaft?
A) U-joint  B) Flexible coupling  
C) Both A and B  D) Neither A nor B

94) Technician A says that knee bolsters are part of the vehicle safety system. Technician B says that vehicle manufacturers are required to use collapsible shafts in the steering column. Which Technician is correct?
A) Technician A only  B) Technician B only  
C) Both technicians  D) Neither technician
95) What component locks the steering wheel in place when the driver removes the key?
   A) Interlock          B) Lock plate
   C) Both A and B      D) Neither A nor B

96) Technician A says that the steering system changes rotary motion into lateral motion.
    Technician B says that steering ratio is influenced by the number of teeth on the worm gear.
    Which technician is correct?
    A) Technician A only  B) Technician B only
    C) Both technicians   D) Neither technician

97) Technician A says that the front wheels are able to rotate through 60–80 degrees of rotation.
    Technician B says that turning the steering wheel all the way left then all the way right is
    turning the wheel "lock to lock." Which technician is correct?
    A) Technician A only  B) Technician B only
    C) Both technicians   D) Neither technician

98) Technician A says that variable ratio steering is not the same thing as variable assist steering.
    Technician B says that constant ratio shaft and sector gears are the same size, unlike systems
    with variable ratio steering. Which technician is correct?
    A) Technician A only  B) Technician B only
    C) Both technicians   D) Neither technician

99) On a variable ratio sector shaft, the center gear tooth is _______ than the side gear teeth.
    A) Smaller          B) Larger

100) Which component of a rack and pinion steering gear is connected to the steering shaft?
     A) The rack support  B) The pinion
     C) The rack          D) The left tie rod

101) The steering wheel hub attaches to the _______ of the steering shaft.
     A) Center          B) Edge          C) Side           D) Top
102) What adjustment is made at this location?

A) Rack support  
B) Pinion freeplay  
C) Pinion bearing preload  
D) None of these

103) In this drawing, what components move when the worm shaft is rotated?

A) Ball nut  
B) Sector shaft  
C) Both A and B  
D) Neither A nor B
104) What adjustment is being made in this illustration?

A) Wormshaft preload  B) Overcenter adjustment  C) Wormshaft endplay  D) Ball return ramps

105) When axle windup is controlled by the rear leaf spring during acceleration, the suspension type is called a(an) ________.
A) Torque arm  B) Trailing arm  C) Semi-trailing arm  D) Hotchkiss drive

106) A loud “bang” is heard and felt every time the accelerator is depressed or released on a rear-wheel drive vehicle. Technician A says that a leaking shock absorber could be the cause. Technician B says that a broken torque arm could be the cause. Which technician is correct?
A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

107) Technician A says that leaf springs are mounted length-wise on the rear of many vehicles. Technician B says that some vehicles use transversely mounted leaf springs on the rear. Which technician is correct?
A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

108) A strut-type suspension is used ________.
A) In the front only  B) In both the front and rear  C) In the rear only  D) In rare vehicles no longer in production
109) Two technicians are discussing rear shock absorbers. Technician A says that if one shock is leaking, then both rear shock absorbers should be replaced. Technician B says that the rear axle should be supported before removing the rear shock absorbers. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

110) A "witness mark" is a ________.
   A) Type of tool  B) Type of fastener  C) Type of identification mark  D) Mark where two parts have rubbed or touched

111) The left front of the vehicle is higher than the right front and the right rear is lower than the left rear. What is the most likely cause of this problem?
   A) A weak right rear shock absorber  B) A broken left front shock absorber  C) A broken track rod  D) A sagging right rear spring

112) One rear leaf spring is broken. Technician A says that both rear leaf springs should be replaced. Technician B says that only the broken spring needs to be replaced. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

113) A track rod is also called a ________.
   A) Semi–independent rod  B) Handling link  C) Panhard rod  D) Control rod

114) Technician A says that solid rear axles are used only in rear–wheel drive vehicles. Technician B says that solid rear axles are used in both front–wheel drive and rear–wheel drive vehicles. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

115) Technician A says that a leaf spring suspension requires control arms to brace and position the rear axle. Technician B says that leaf springs help locate the axle under the vehicle. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

116) Technician A says that trailing arms include any arm where the supported member trails the arm. Technician B says that trailing arms may also be called control arms on some vehicles. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician
117) Technician A says that a torque arm is designed to support the weight of the vehicle. Technician B says that a torque arm is designed to prevent rear axle wind up. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

118) Technician A says that many unit body suspensions use struts on the rear. Technician B says that most full frame vehicles use struts on the rear. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

119) Technician A says that SLA suspensions reduce tire scrub. Technician B says that solid rear axles are used with independent rear suspensions. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

120) Technician A says that suspension diagnosis and service should begin with a comprehensive test drive. Technician B says that shocks or struts should be replaced in axle pairs. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

121) Technician A says that the center bolt on a leaf spring can be removed after the spring is installed. Technician B says that individual leaves of a leaf spring often crack before breaking. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

122) Which of the following is a disadvantage of a solid rear axle?
   A) Reduced tire adhesion  
   B) Increased proportion of unsprung weight  
   C) Side to side shock transference  
   D) All of these are disadvantages of a solid rear axle

123) Which of the following reduce tire adhesion (traction)?
   A) Shimmy  
   B) Unsprung weight  
   C) Wheel tramp  
   D) All of these reduce tire adhesion

124) Technician A says that as axle shafts rotate in one direction to drive the wheels, the axle housing attempts to rotate in the opposite direction. Technician B says this is called torque steer. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

125) Axle windup is most often a problem with ________.
   A) Front-wheel drive vehicles  
   B) Vehicles with a live rear axle  
   C) Both A and B  
   D) Neither A nor B
126) Technician A says that trailing arms run perpendicular to the center line of the chassis. Technician B says that trailing arms run parallel to the center line of the chassis. Which technician is correct?
   A) Technician A only  
   B) Technician B only
   C) Both technicians  
   D) Neither technician

127) Technician A says that a torque arm runs perpendicular the the driveshaft. Technician B says that a torque arm runs parallel to the driveshaft. Which technician is correct?
   A) Technician A only  
   B) Technician B only
   C) Both technicians  
   D) Neither technician

128) Panhard rods are installed _______.
   A) To support the weight of the vehicle  
   B) Parallel to the centerline of the chassis
   C) Parallel to the rear live axle  
   D) None of these

129) Technician A says that vehicles with independent rear suspensions provide better handling than those with solid rear axles. Technician B says that vehicles with independent rear suspensions generally have less unsprung weight. Which technician is correct?
   A) Technician A only  
   B) Technician B only
   C) Both technicians  
   D) Neither technician

130) Technician A says that a semi-independent rear suspension is used with live rear axles. Technician B says that the semi-independent rear suspension is used only with non-drive rear axles. Which technician is correct?
   A) Technician A only  
   B) Technician B only
   C) Both technicians  
   D) Neither technician

131) Technician A says that the top mounting nut for a rear shock absorber is often located inside the vehicle. Technician B says that shocks, struts, and springs should always be replaced in axle sets. Which technician is correct?
   A) Technician A only  
   B) Technician B only
   C) Both technicians  
   D) Neither technician
132) Identify this suspension type.

A) Independent suspension  
B) Solid axle  
C) Leaf spring suspension  
D) Semi-independent suspension

133) Which of these components is the Panhard rod?

A) A  
B) B  
C) C  
D) D

134) Two technicians are discussing non-indicator type ball joint inspection. Technician A says that the vehicle should be on the ground with the ball joints loaded, then checked for free play. Technician B says the ball joints should be unloaded before checking for free play. Which technician is correct?

A) Technician A only  
B) Technician B only  
C) Both technicians  
D) Neither technician
135) Most manufacturers specify a maximum axial play for ball joints of about ________.
   A) 0.030 in. (0.76 mm)  B) 0.010 in. (0.25 mm)
   C) 0.050 in. (1.27 mm)  D) 0.003 in. (0.076 mm)

136) The preferred method to separate tapered chassis parts is to use ________.
   A) A torch to heat the joint until it separates
   B) A puller tool or two hammers to shock and deform the taper
   C) A drill to drill out the tapered part
   D) A pickle fork

137) A light film of oil is observed on the upper area of a shock absorber. Technician A says that
   this condition should be considered normal. Technician B says that a rod seal may bleed fluid
during cold weather, causing the oil film. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

138) Before the strut insert can be removed from a typical MacPherson strut assembly, which
   operation is necessary to prevent possible personal injury?
   A) The brake caliper and/or brake hose should be removed from the housing
   B) The coil spring should be compressed
   C) The lower attaching bolts should be removed
   D) The upper strut mounting bolts should be removed

139) What should the technician do when replacing stabilizer bar links?
   A) The stabilizer bar should be removed from the vehicle before replacing the links
   B) The links can be replaced individually, yet the manufacturer often recommends that the
   links at both ends be replaced together
   C) The stabilizer bar must be compressed using a special tool before removing or installing
   stabilizer bar links
   D) Both B and C are correct

140) A noise and a pull toward one side during braking is a common symptom of a worn or
   defective ________.
   A) Shock absorber
   B) Stabilizer bar link
   C) Strut rod bushing
   D) Track rod bushing

141) To help prevent vehicle wandering on a vehicle with torsion bars, the ride height should be
   within ________ side to side.
   A) 0.100 in. (2.5 mm)  B) 0.050 in. (1.27 mm)
   C) 0.003 in. (0.076 mm)  D) 0.125 in. (3.2 mm)

142) Two technicians are discussing suspension bushings. Technician A says that replacing control
   arm bushings usually requires special tools. Technician B says using high-performance
   urethane bushings may cause excessive noise to be transferred to the passenger compartment.
   Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician
143) Technician A says that the two main links in an SLA suspension are the upper control arm and the lower control arm. Technician B says that front suspensions with MacPherson struts usually have only one control arm. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

144) Where is the most common location for the coil spring on an SLA front suspension?
   A) Stabilizer bar  B) Lower control arm  C) Radius arm  D) Upper control arm

145) Technician A says that torsion bars are welded in place and cannot be adjusted. Technician B says that torsion bars are adjusted by using a wrench to turn the torsion bar clockwise. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

146) Technician A says that a MacPherson strut typically does not include the spring as part of the strut assembly. Technician B says that a modified strut typically does not include the spring as part of the strut assembly. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

147) Technician A says that a road test should never be performed before service, for safety reasons. Technician B says that the purpose of any diagnosis is to eliminate known good components. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

148) Which of the following is NOT helpful information in diagnosing a suspension problem?
   A) If the problem gets worse while turning or going straight  
   B) If the problem gets worse with a warm or cold engine  
   C) If the problem gets worse in warm or cold weather  
   D) All of these are helpful hints for diagnosis

149) A proper road test should include which of the following?
   A) Driving in reverse while turning  B) Driving beside stationary objects  
   C) Driving on bumpy roads  D) All of these are useful road test tips

150) Technician A says that a dry park test should be performed as part of the diagnosis. Technician B says that the dry park test should be performed with one technician moving the steering wheel while another watches and feels for movement in steering and suspension components. Which technician is correct?
   A) Technician A only  B) Technician B only  C) Both technicians  D) Neither technician

151) A dry park test can be useful to diagnose which of the following?
   A) Control arm bushing wear  B) Ball joint movement  
   C) Front wheel bearing failure  D) All of these are correct
152) Defective ball joints can cause all of the following problems EXCEPT ________.
   A) Vehicle wander on a straight road
   B) Loud popping or squeaking when driving over bumps
   C) Shimmy-type vibration felt in the steering wheel
   D) All of these can be caused by defective ball joints

153) Technician A says that wear indicator ball joints should be unloaded to check properly.
   Technician B says that wear indicator ball joints should be checked with the weight of the
   vehicle on the ground. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

154) A vehicle is equipped with longitudinal torsion bars attached to the front lower control arms.
   Technician A says that this vehicle has loaded lower ball joints. Technician B says that the ball
   joints on this vehicle should be unloaded to test for radial and axial play. Which technician is
   correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

155) Which tool is most often used to measure suspension component free play?
   A) Micrometer
   B) Dial indicator
   C) Vernier caliper
   D) Telescoping gauges

156) Technician A says that most loaded ball joints can have up to 0.050 inches of axial free play
   and still be within specifications. Technician B says that follower ball joints generally should
   have no more than 0.050 inches of play. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

157) Technician A says that when removing pinch bolt connections, turn the nut, not the bolt.
   Technician B says to tighten the pinch bolt until the steering knuckle is deformed by 0.050
   inches. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

158) Technician A says that many vehicles use lower control arms with non-removable ball joints.
   Technician B says that heat should be used to bend a deformed suspension component within
   specifications. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

159) Technician A says to install press-fit ball joints using a hammer on the ball joint housing to
   seat the ball joint in the control arm. Technician B says that a tool resembling a large C-clamp
   should be used to press ball joints in and out. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician
160) Technician A says that front shock replacement on most vehicles requires a special spring compressor. Technician B says that front shock absorbers can be replaced with the weight of the vehicle on the wheels. Which technician is correct?
A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

161) Technician A says that it is a good idea to recommend replacing upper strut bearings when replacing MacPherson struts. Technician B says that all MacPherson struts can be serviced by replacing the cartridge inside the strut assembly. Which technician is correct?
A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

162) While servicing a vehicle with modified strut front suspension, technician A makes sure the lower control arm is supported. Technician B says that the coil spring must be removed from the strut assembly to service a modified strut vehicle. Which technician is correct?
A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

163) Which of the ball joints in this illustration is worn out and needs replacing?
A) A
B) B
C) Both are worn out
D) Both are OK

164) Which of these illustrates axial ball joint play?
A) A
B) B
C) Both A and B
D) Neither A nor B
165) Two technicians are discussing torsion bars. Technician A says that many torsion bars are 
adjustable to allow for ride height adjustment. Technician B says that torsion bars are usually 
marked left and right and should not be switched side to side. Which technician is correct? 
A) Technician A only 
B) Technician B only 
C) Both technicians 
D) Neither technician

166) What component(s) is(are) considered to be unsprung weight? 
A) Frame 
B) Body 
C) Wheels and tires 
D) Both A and B

167) Two technicians are discussing MacPherson struts. Technician A says that in most applications 
the entire strut assembly rotates when the front wheels are turned. Technician B says that a 
typical MacPherson strut suspension system uses only one control arm and one ball joint per 
side. Which technician is correct? 
A) Technician A only 
B) Technician B only 
C) Both technicians 
D) Neither technician

168) Technician A says that regular replacement shock absorbers will raise the rear of a vehicle that 
is sagging down. Technician B says that replacement springs will be required to restore the 
proper ride height. Which technician is correct? 
A) Technician A only 
B) Technician B only 
C) Both technicians 
D) Neither technician

169) What suspension component is used to counteract body lean during cornering? 
A) Torsion bar 
B) Strut rod 
C) Stabilizer bar 
D) Control arm

170) A center bolt is used in what type of spring? 
A) Torsion bar 
B) Coil 
C) Leaf 
D) All of the above

171) Two technicians are discussing air shocks. Technician A says that air is forced through small 
holes to dampen the ride. Technician B says that air shocks are conventional hydraulic shock 
absorbers with an airbag to control vehicle ride height. Which technician is correct? 
A) Technician A only 
B) Technician B only 
C) Both technicians 
D) Neither technician

172) The owner of a pickup truck wants to cut the coil springs to lower the vehicle. Technician A 
says that the ride will be harsher than normal if the springs are cut. Technician B says that the 
springs could be damaged, especially if a cutting torch is used to cut the springs. Which 
technician is correct? 
A) Technician A only 
B) Technician B only 
C) Both technicians 
D) Neither technician

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false. 

173) A MacPherson strut is a structural part of the vehicle.
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

174) Most pickup trucks use which type of frame?
   A) Unit body  
   B) Stub frame  
   C) Full frame  
   D) None of these is correct

175) Which component is used on FWD vehicles to support the engine and transmission?
   A) Ladder frame  
   B) Perimeter frame  
   C) Cradle  
   D) Body mount

176) What frame design combines the body with the structure of the frame?
   A) Full frame  
   B) Ladder frame  
   C) Perimeter frame  
   D) Unit body

177) What provides the strength of the structure for unit body vehicles?
   A) Space frame  
   B) Full frame  
   C) Shape of the assembly  
   D) Cross members

178) What term describes the weight of the vehicle with all fluids filled but no passengers or cargo?
   A) Rated weight  
   B) Curb weight  
   C) GVW  
   D) Model weight

179) What term describes the basic shape and size of a vehicle?
   A) Wheelbase  
   B) Track  
   C) Profile  
   D) Platform

180) Technician A says that vehicles with less unsprung weight have better handling. Technician B says that the wheel and tire assembly are considered sprung weight. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

181) Technician A says that most modern vehicles have independent front suspensions. Technician B says that no vehicle has an independent rear suspension. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

182) Which component transfers vehicle weight to the wheels?
   A) Shocks  
   B) Springs  
   C) Struts  
   D) Axles

183) Which of the following is NOT a type of automotive spring?
   A) Coil  
   B) Leaf  
   C) Torsion bar  
   D) All of these are automotive springs

184) Technician A says that compression of a vehicle spring is called jounce. Technician B says that extending the vehicle spring is called rebound. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician
185) Which law states that the deflection of a spring is directly proportional to the applied force?  
A) Halderman’s law  
B) Newton’s law  
C) Pascal’s law  
D) Hooke’s law

186) Technician A says that all automotive coil springs have the same number of coils. Technician B says that coil spring spacers can cause damage to the spring. Which technician is correct?  
A) Technician A only  
B) Technician B only  
C) Both technicians  
D) Neither technician

187) Technician A says that a constant rate spring has the same deflection rate throughout its entire range of compression. Technician B says that some coil springs have different diameters at the top and bottom of the spring. Which technician is correct?  
A) Technician A only  
B) Technician B only  
C) Both technicians  
D) Neither technician

188) Technician A says that each coil spring is specifically engineered to be installed on one particular side of the vehicle. Technician B says that rubber spring pockets prevent excessive noise. Which technician is correct?  
A) Technician A only  
B) Technician B only  
C) Both technicians  
D) Neither technician

189) Technician A says that cutting coil springs is an acceptable method of properly lowering a vehicle. Technician B says that all leaf springs are made of steel. Which technician is correct?  
A) Technician A only  
B) Technician B only  
C) Both technicians  
D) Neither technician

190) Technician A says that torsion bars can be reinstalled on either side of the vehicle. Technician B says that torsion bars are often used on 4x4 trucks. Which technician is correct?  
A) Technician A only  
B) Technician B only  
C) Both technicians  
D) Neither technician

191) Which component supports the wheel and attaches to the control arms?  
A) Ball joint  
B) Sway bar  
C) Spindle  
D) Shock absorber

192) Which of the following is NOT true?  
A) Struts control spring oscillation  
B) MacPherson struts attach to the steering knuckle  
C) MacPherson strut suspension systems do not use loaded ball joints  
D) Struts pivot on an upper ball joint

193) A shock absorber (damper) controls spring oscillation using what principle?  
A) Compressing and decompressing air  
B) A piston moving through hydraulic fluid  
C) Hydraulic fluid being forced through small openings  
D) Both B and C  
E) None of these
194) In this illustration, which ball joint is the load carrying ball joint?

A) A  
B) B  
C) C  
D) None of these

195) In this illustration, identify the stabilizer bar.

A) A  
B) B  
C) C  
D) D

196) When seating a bead of a tire, never exceed ______ psi.
A) 50  
B) 60  
C) 30  
D) 40

197) For best tire life, most vehicle manufacturers recommend tire rotation every ______.
A) 9000 miles  
B) 6000 miles  
C) 12000 miles  
D) 3000 miles

198) What lubricant should be used when mounting a tire?
A) Grease  
B) Water-based soap  
C) Silicone spray  
D) SAE 10W-30 engine oil

199) Using the modified X-method of tire rotation on a front wheel drive vehicle, where should the left front wheel be placed?
A) Keep it at the left front  
B) Right front  
C) Left rear  
D) Right rear
200) Which statement below is FALSE?
   A) Excessive lateral runout can cause a tramp-type vibration
   B) A tire out of balance dynamically can cause a shimmy-type vibration
   C) A tire out of balance statically can cause a tramp-type vibration
   D) Excessive radial runout can cause a tramp-type vibration

201) The recommended type of wheel weight to use on aluminum (alloy) wheels is _______.
   A) Lead weights with longer than normal clips
   B) Aluminum weights
   C) Lead with plated spring steel clips
   D) Coated (painted) or stick-on lead weights

202) Most vehicle and tire manufacturers recommend that no more than ______ ounce balance weight be added to a wheel/tire assembly.
   A) 5.5          B) 4.5          C) 2.5          D) 3.5

203) A vehicle vibrates at highway speed. Technician A says that water in the tire(s) could be the cause. Technician B says that an out-of-round tire could be the cause. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

204) Proper tire inflation pressure specification is found _______.
   A) On the driver's door or post
   B) In the owner's manual
   C) On the sidewall of the tire
   D) Both A and B

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

205) It is best to mount a tire with the round sticker aligned with the valve core.  

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

206) Technician A uses silicone lubricant to seat the bead of a tire. Technician B uses motor oil to seat the bead of a tire. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

207) Wheel lug nuts should be tightened _______.
   A) By hand
   B) With an air impact wrench
   C) By hand, plus 1/4 turn
   D) With a torque wrench

208) What term is used to describe how a vehicle handles when cornering and additional steering input is needed to maintain the corner?
   A) Understeer
   B) Oversteer

209) What term describes a condition when the rear tires lose traction before the front tires?
   A) Oversteer
   B) Understeer
210) Technician A uses an impact socket on an impact wrench to tighten lug nuts. Technician B tightens lug nuts in a criss-cross pattern with a torque wrench. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

211) Technician A says that a vibration above 45 MPH indicates a possible out-of-balance tire. Technician B says that a vibration above 45 MPH can only be diagnosed if engine load is considered. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

212) Technician A says that the recommended method of tire rotation is front to rear. Technician B says that the recommended method of tire rotation is the modified X method. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

213) If a vibration is felt in the steering wheel above 45 MPH, the problem is usually out-of-balance rear tires.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

214) Technician A says to check tire radial runout to determine the cause of high speed vibration. Technician B says to check tire axial runout to determine the cause of high speed vibration. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

215) What is the proper instrument for measuring runout?
   A) Outside micrometer   B) Vernier caliper
   C) Dial indicator   D) Inside micrometer

216) Technician A says that inflation pressures vary with outside temperature. Technician B says that under-inflated tires cause reduced fuel economy. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

217) Two technicians are discussing a diagnostic procedure where a tire and wheel is spun freely with the vehicle on a hoist. Technician A says that if the treads appear to move inward and outward the tire should be balanced. Technician B says that if the treads move inward and outward the tire is defective and should be replaced. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician
218) When installing a tire pressure monitoring system sensor on a wheel, the sensor should be mounted ________.
   A) With the flat part of the sensor facing the center section of the rim
   B) With the flat part of the sensor parallel to the center section of the rim
   C) Both A and B
   D) Neither A nor B

219) What is the term used to describe mounting a tire with the valve stem lined up with the dot painted on the tire?
   A) Wheel balancing
   B) Equal configuration
   C) Match mounting
   D) None of these

220) Technician A says that it is recommended that the vehicle be driven less than 50 mph for the first 50 miles to allow the tire to adhere to the wheel. Technician B says that sudden hard acceleration with newly mounted tires can cause the tire to change position on the wheel. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

221) Technician A says that most manufacturers recommend using lug nut grease on lug studs when installing wheels. Technician B says that air impact wrenches are the best tool to tighten lug nuts. Which technician is correct?
   A) Technician A only
   B) Technician B only
   C) Both technicians
   D) Neither technician

222) What is the proper tightening sequence for lug nuts?
   A) Counterclockwise rotation
   B) Star (criss-cross) pattern
   C) Clockwise rotation
   D) None of these

223) Anytime a set of aluminum wheels is installed, the lug nuts should be re-torqued after how many miles?
   A) 50
   B) 100
   C) 75
   D) 25

224) Compressed nitrogen is sometimes used for tire inflation because it holds less moisture than compressed air.
   A) True
   B) False

225) When using a torque limiting adapter with an air impact wrench, what is the suggested maximum air pressure for the air tool?
   A) 90 psi
   B) 125 psi
   C) 30 psi
   D) None of these

226) Which is the preferred method for tire rotation?
   A) Full "x"
   B) Side to side
   C) Modified "x"
   D) Front to rear

227) A leak in a tire can be found using ________.
   A) A pressure gauge
   B) Spray insecticide
   C) Soapy water
   D) Powder
228) A hole in the tire tread can be patched with ________.
   A) Rope  
   B) A patch  
   C) A plug  
   D) Either A or B  
   E) None of these

229) In the tool setup shown here, the technician is preparing to measure ________.
   A) Tire balance  
   B) Radial runout  
   C) Tire out-of-round  
   D) Lateral runout

230) Which tire inflation information should be checked to determine the proper tire inflation pressure?
   A) Cold placard inflation pressure  
   B) 32 PSI in all tires  
   C) The maximum pressure as stated on the sidewall of the tire  
   D) Any of the above

231) Two technicians are discussing tire pressure and temperature. Technician A says that tire pressure will drop 1 PSI for every 10 degrees drop in temperature. Technician B says that the tire pressure will increase as the vehicle is being driven. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

232) Two technicians are discussing the indirect tire-pressure monitoring system. Technician A says that it was used by some vehicle manufacturers on vehicles before the 2008 model year. Technician B says that it uses the speeds of the RF and LR tires and compares the rotating speeds of the LF and RR tires to detect a low tire. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

233) The FMVSS 138 law requires that the driver be notified if the tire inflation pressure drops how much?
   A) 15%  
   B) 30%  
   C) 20%  
   D) 25%
234) The two basic types of direct TPMS sensors include ________.
   A) Rubber stem and aluminum stem  
   B) Stem mounted and banded  
   C) Beru and Schrader  
   D) Indirect and direct

235) What mode does a direct pressure sensor enter when the vehicle is stopped?
   A) Storage mode  
   B) Active mode  
   C) Sleep mode  
   D) Alert mode

236) To activate or learn a direct pressure sensor, what does the service technician need to do?
   A) Use a handheld tester  
   B) Enter learn mode and decrease inflation pressure  
   C) Enter learn mode and use a magnet  
   D) Any of the above, depending on the vehicle and system

237) What does the "delta pressure method" mean?
   A) Change the inflation pressure  
   B) Inflating the tire to the specified pressure  
   C) Using a handheld tester to read the pressure as reported by the sensor  
   D) Activate the sensor so it broadcasts the pressure to the scan tool

238) What type of valve core is used in stem-mounted sensors?
   A) Nickel plated  
   B) Aluminum  
   C) Steel  
   D) Brass

239) Technician A says that a tire pressure monitor system that uses a valve-stem-type transmitter is the direct reading type of TPMS. Technician B says that a tire pressure monitoring system that uses a sensor inside and strapped to the wheel is an indirect reading type of TPMS. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

240) A 2010 vehicle with TPMS has a flashing TPMS warning lamp. This means ________.
   A) The vehicle has a flat tire  
   B) The TPMS has detected a fault with the system  
   C) Either A or B  
   D) Neither A nor B

241) All vehicles sold in the United States must have a tire pressure monitoring system, starting with model year ________.
   A) 2004  
   B) 2010  
   C) 2008  
   D) 2006

242) When rotating tires on a vehicle equipped with TPMS Technician A says that the sensors will be automatically relearned after driving a few miles. Technician B says that the sensor positions should be relearned, using a special tool, before returning the vehicle to the customer. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician
243) A vehicle with TPMS has tire pressure warning light on steady. The owner says that all 4 tires have the correct pressure. Technician A says that the spare tire pressure could be low. Technician B says that a sensor may be bad. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

244) On a General Motors vehicle, sensor programming starts with which wheel?
   A) Left rear  
   B) Right front  
   C) Right rear  
   D) Left front

245) A tire has a recommended pressure of 32 PSI. The TPMS should light the lamp when the pressure in this tire reaches ________.
   A) 26 PSI  
   B) 27 PSI  
   C) 24 PSI  
   D) 30 PSI

246) Technician A says that the tire pressure can be 5 PSI below specification but not turn on the TPMS warning lamp. Technician B says that vehicles with TPMS do not need to have the tire pressure checked monthly. Which technician is correct?
   A) Technician A only  
   B) Technician B only  
   C) Both technicians  
   D) Neither technician

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

247) If a 2008 vehicle is equipped with rubber valve stems it does not have TPMS.  
248) The TPMS battery should be changed when the tires are replaced.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

249) The aspect ratio of a tire means ________.
   A) The ratio of height to width  
   B) Its width to diameter of a wheel ratio  
   C) The ratio of width to height  
   D) The ratio of rolling resistance

250) A tire is labeled 215/60Rx15 92T; the T indicates ________.
   A) Its tread wear rating  
   B) Its speed rating  
   C) Its load rating  
   D) Its temperature resistance rating

251) A tire is labeled 215/60Rx15 92T; the 92 refers to the tire’s ________.
   A) Tread wear rating  
   B) Speed rating  
   C) Load rating  
   D) Temperature resistance rating

252) Radial tires can cause a vehicle to pull to one side while driving. This is called "radial tire pull" and is often due to ________.
   A) Bead design  
   B) The angle of the body (carcass) plies  
   C) Tire conicity  
   D) Tread design
253) Tire inflation is very important to the safe and economical operation of any vehicle. Technician A says that the tire pressure should never exceed the maximum pressure imprinted on the sidewall of the tire. Technician B says to inflate tires to the pressures recommended on the tire information decal or placard on the driver's door. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

254) When purchasing replacement tires, do not change tire width from the stock size by more than ________.
   A) 15 mm   B) 20 mm   C) 25 mm   D) 10 mm

255) What do the letters JJ mean in a wheel designation size labeled 14x7JJ?
   A) The shape of the flange area   B) The offset of the rim
   C) The back spacing of the rim   D) The bolt circle code

256) Technician A says that a PAX run-flat tire uses a special wheel. Technician B says that a standard tire can be used to replace a PAX run-flat tire. Which technician is correct?
   A) Technician A   B) Technician B
   C) Both technicians   D) Neither technician

257) Wheel back spacing is also called ________.
   A) Positive offset   B) Offset
   C) Rear spacing   D) Negative offset

258) Front-wheel drive vehicles usually use what type of wheel?
   A) Either one, depending on the tire size   B) Negative offset
   C) Positive offset   D) Neither of these

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

259) All radial tires are belted.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

260) Which of the following is not part of the UTQG system?
   A) Temperature   B) Traction   C) Speed rating   D) Treadwear

261) Technician A says that all tires sold for passenger vehicle use must be approved by the DOT. Technician B says that the DOT code will indicate the build date of the tire. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician

262) Technician A says to always purchase replacement tires with the same or greater speed rating as when the vehicle was new. Technician B says to install the same type of tire (example: m+s) on all wheels. Which technician is correct?
   A) Technician A only   B) Technician B only
   C) Both technicians   D) Neither technician
263) If the center section of a wheel is outward from the wheel center line, it has ________.
   A) Positive offset  B) Negative offset

264) Technician A says that backspacing is the same as offset. Technician B says that backspacing is the distance between the back rim edge and the wheel center section. Which technician is correct?
   A) Technician A only  B) Technician B only  
   C) Both technicians  D) Neither technician

265) Technician A says that the bolt circle is the diameter of a circle that can be drawn through the center of each lug hole or stud. Technician B says that lug nuts have different tapers to fit different wheel lug holes. Which technician is correct?
   A) Technician A only  B) Technician B only  
   C) Both technicians  D) Neither technician

266) Which of these is (are) a main function of tires?
   A) Serve as shock absorbers to cushion the vehicle ride  
   B) Provide friction (traction) between the vehicle and the road  
   C) Both A and B  D) Neither A nor B

267) Technician A says that grooves in the tire tread are necessary for excellent dry traction. Technician B says that grooves in the tire tread are necessary for wet traction, to prevent hydroplaning. Which technician is correct?
   A) Technician A only  B) Technician B only  
   C) Both technicians  D) Neither technician

268) Hydroplaning can occur at speeds as low as ________.
   A) 40 mph  B) 55 mph  C) 45 mph  D) 30 mph

269) Technician A says that a damaged bead can be repaired. Technician B says that tires with damaged beads must be replaced. Which technician is correct?
   A) Technician A only  B) Technician B only  
   C) Both technicians  D) Neither technician

270) Kevlar is the brand name for which fiber used in tire construction?
   A) Nylon  B) Aramid  C) Polyester  D) None of these

271) Which of the following may be part of a radial tire belt?
   A) Nylon  B) Steel mesh  
   C) Rayon  D) All of these are correct

272) The dot painted on many tires near the major splice indicates ________.
   A) The largest diameter of the tire  B) A sipe  
   C) The smallest diameter of the tire  D) None of these
During tire construction, after the tire has been heated to 300 degrees F (150 degrees C) for 30 minutes, it is called a ________.
A) Cured tire  
B) Green tire  
C) Both A and B  
D) Neither A nor B

High flotation truck tires are designed for ________.
A) Superior traction in sand or mud  
B) Superior off-road performance  
C) Both A and B  
D) Neither A nor B

Technician A says that the load index marked on the tire indicates the maximum load the vehicle can carry. Technician B says that the load index marked on the tire indicates the maximum load each tire is designed to carry. Which technician is correct?
A) Technician A only  
B) Technician B only  
C) Both technicians  
D) Neither technician

Which part of the wheel shown is responsible for holding the tire beads in place?
A) A  
B) B  
C) C  
D) None of these

Which number or letter indicates the tire height?
A) A  
B) B  
C) C  
D) D  
E) E  
F) F
Answer Key
Testname: UNTITLED1

49) D
50) B
51) B
52) A
53) D
54) D
55) C
56) D
57) B
58) B
59) A
60) C
61) B
62) C
63) C
64) A
65) C
66) B
67) C
68) B
69) D
70) A
71) D
72) D
73) B
74) B
75) D
76) A
77) A
78) A
79) B
80) A
81) D
82) B
83) D
84) C
85) A
86) C
87) C
88) D
89) A
90) C
91) B
92) C
93) B
94) C
95) B
96) C
97) C
98) C
99) B
100) B
101) D
102) A
103) C
104) B
105) D
106) B
107) C
108) B
109) C
110) D
111) D
112) A
113) C
114) B
115) B
116) C
117) B
118) A
119) A
120) C
121) B
122) D
123) D
124) A
125) B
126) B
127) B
128) C
129) C
130) B
131) C
132) A
133) B
134) B
135) C
136) B
137) C
138) B
139) B
140) C
141) D
142) C
143) C
144) B
Answer Key
Testname: UNTITLED1

145) D
146) B
147) B
148) D
149) D
150) C
151) D
152) D
153) B
154) C
155) B
156) A
157) A
158) A
159) B
160) B
161) A
162) A
163) A
164) A
165) C
166) C
167) C
168) B
169) C
170) C
171) B
172) C
173) TRUE
174) C
175) C
176) D
177) C
178) B
179) D
180) A
181) A
182) B
183) D
184) C
185) D
186) B
187) C
188) C
189) D
190) B
191) C
192) D
Answer Key
Testname: UNTITLED1

193) D
194) B
195) A
196) D
197) B
198) B
199) C
200) A
201) D
202) A
203) C
204) D
205) TRUE
206) D
207) D
208) A
209) A
210) B
211) A
212) B
213) FALSE
214) A
215) C
216) C
217) B
218) C
219) C
220) C
221) D
222) B
223) D
224) A
225) B
226) C
227) C
228) D
229) D
230) A
231) C
232) C
233) D
234) B
235) C
236) D
237) A
238) A
239) A
240) B
Answer Key
Testname: UNTITLED1

241) C
242) B
243) A
244) D
245) C
246) A
247) FALSE
248) FALSE
249) A
250) B
251) C
252) C
253) C
254) D
255) A
256) A
257) C
258) C
259) TRUE
260) C
261) C
262) C
263) A
264) B
265) C
266) C
267) B
268) D
269) B
270) B
271) D
272) A
273) A
274) C
275) B
276) A
277) B