

PRACTICE EXAM 15: CANADIAN 310T TRUCK AND COACH TECHNICIAN SIMULATION (135 QUESTIONS)

This practice exam contains 135 multiple-choice questions, each with four options (A, B, C, and D), matching the format of the Interprovincial Red Seal exam for this trade. Allow about four hours and work without manuals or notes. Choose the single best answer for each question. A score of 70 percent, or 95 correct answers, is the pass mark. Check your answers against the key and explanations at the end of the exam.

1. A plow truck carries two 60 W headlamps and two 36 W strobes on a 12 V system. What is the total current drawn when all four are on?
 - A. 12 A
 - B. 192 A
 - C. 8 A
 - D. 16 A

2. A snow-removal truck spends hours idling at a high idle speed while a PTO-driven blower runs at light load. The particulate filter soot load keeps rising. What is the cause?
 - A. Excess boost pressure from the high idle speed forces extra soot into the filter
 - B. Low exhaust temperature from light-load operation prevents passive soot oxidation
 - C. The high idle speed reduces the volume of exhaust gas passing through the filter
 - D. The PTO load heats the filter element so much that soot hardens in place

3. A fleet adds a heavy front-mounted plow to a tandem truck and the front end sits low, with the steering wandering. What should the technician verify first?
 - A. That the rear tires are inflated 140 kPa above normal to balance the extra front weight
 - B. That the drive shaft is rebalanced to a tighter tolerance after the plow is installed

- C. The front axle load with the plow against the axle rating, and the spring capacity
- D. That the air dryer is rated for the extra weight carried by the front axle

4. A transmission-mounted PTO on a spreader truck is engaged by an air-operated shift cylinder. The PTO pops out of gear whenever the pump is loaded, and air is heard leaking at the cylinder rod. What is the correct repair?

- A. Increase the air supply pressure at the regulator above the brake system setting
- B. Add a heavier detent spring inside the PTO housing to hold the gear
- C. Replace the PTO switch because it is sending a false disengage signal
- D. Rebuild or replace the shift cylinder so it can hold full engagement pressure

5. A transmission PTO has a speed ratio of 1.15 times engine speed. The engine runs at 1,200 rpm during a stationary hydraulic job. At what speed does the PTO output shaft turn?

- A. 1,043 rpm
- B. 1,380 rpm
- C. 1,200 rpm
- D. 1,550 rpm

6. A technician must tighten a PTO pump mounting bolt to 300 N·m using a 450 mm click-type torque wrench fitted with a 50 mm straight crowfoot extension in line with the wrench. What wrench setting should be used?

- A. 300 N·m
- B. 333 N·m
- C. 270 N·m
- D. 250 N·m

7. A trailer landing gear is hard to crank while loaded and the gearbox is noisy. What should the technician check first?

- A. Gearbox lubrication, the speed range selected, and worn or bent gears
- B. The trailer wheel bearing endplay and the hub oil level on the axle
- C. The tractor's air dryer cartridge and the purge valve discharge timing
- D. The brake lining thickness and slack adjuster stroke on the trailer axle

8. A mobile hydraulic system uses a load-sensing, pressure-compensated pump. What does the pump do when all the control valves are in neutral?

- A. It delivers full flow at the relief valve pressure setting while waiting
- B. It stops completely and lets all pressure in the lines bleed away
- C. It delivers flow at a rate set only by the engine speed
- D. It delivers only enough flow to hold a low standby pressure

9. Why is a relay normally used to switch a high-current accessory such as a plow light bar from a dash switch?

- A. The relay carries the heavy load current so the dash switch handles only control current
- B. The relay raises the voltage available to the accessory above battery voltage
- C. The relay reduces the current that the accessory itself draws from the battery
- D. The relay stores energy to keep the accessory working when the battery is low

10. An oil sample from a utility truck that spends most of its day idling shows 6 percent fuel dilution. Which cause is most likely?

- A. A leaking oil cooler core that allows fuel from the coolant into the oil
- B. A worn turbocharger seal that draws fuel through the compressor housing
- C. A leaking injector or repeated post-injection during frequent regeneration cycles
- D. A blocked crankcase breather that traps fuel vapour in the sump

11. A cab heater blows warm but never hot, and both heater hoses are hot. The engine runs at normal temperature. Which component is a likely cause?

- A. A weak air compressor in the brake system that is cycling too often
- B. A blend door or actuator stuck partly open, mixing in cold air
- C. A restricted fuel return line causing high fuel temperature at the tank
- D. A cracked exhaust manifold gasket leaking hot gas near the firewall

12. A technician adjusts a steering gear for lash. Where should the sector shaft be positioned when making the adjustment?

- A. At full left lock, to find the maximum lash in the sector gear
- B. At full right lock, with the pump relief valve held open at the stop
- C. At the centre position, where the gear is slightly tighter by design
- D. In any position, since the lash stays the same throughout the whole travel

13. A technician sets the pushrod angle on a slack adjuster. When the brake is fully applied, at what angle should the adjuster arm and pushrod normally be?

- A. About 45 degrees to each other
- B. Parallel to each other
- C. About 120 degrees to each other
- D. About 90 degrees to each other

14. A manual-transmission truck has a transmission-mounted PTO that is driven through the clutch and input shaft gears. Which step is required before engaging the PTO?

- A. Depress the clutch to stop the gear train, engage the PTO, then release the clutch
- B. Engage the PTO while at highway speed so the gear speeds can match each other
- C. Leave the clutch engaged and raise the engine to high idle before engaging
- D. Shut the engine off and engage the PTO by hand before restarting the engine

15. A plow truck cab vibrates heavily at idle and a technician finds the rubber cab mount cracked and flattened. What is the correct repair?

- A. Add a thicker washer under the mount to raise the cab
- B. Replace the damaged cab mount and torque the fasteners to specification
- C. Tighten the cab mounting bolts as far as possible
- D. Fill the crack in the mount with sealant

16. With all plow lights on and the engine at low idle, battery voltage falls below 12.5 V and keeps dropping. The alternator tests normal. What is the best correction?

- A. Replace the batteries with a larger starting type and leave the charging system as is
- B. Remove the voltage regulator so the alternator can use a higher charging voltage
- C. Raise the idle speed while plowing, or fit a higher-output alternator
- D. Disconnect one battery so the alternator has a smaller charging demand to meet

17. A PTO-driven pump unit runs a bucket truck engine at 1,200 rpm for an hour. Coolant temperature climbs to 108 °C although the radiator is clean and the fan turns when engaged. What should be tested first?

- A. The exhaust brake butterfly, since it can restrict exhaust flow at low rpm and heat the block
- B. Whether the fan drive is engaging fully and moving air at low vehicle speed
- C. The air compressor governor, since the compressor adds heat directly to the coolant
- D. The turbocharger wastegate, since it cools the intake charge before it enters the engine

18. A hybrid bucket truck has an electric PTO that runs the boom pump from the high-voltage battery with the engine off. What is required before servicing the inverter that powers the pump?

- A. Follow the high-voltage lockout, wait out the discharge time, and verify zero volts
- B. Disconnect only the 12 V battery and begin work immediately on the inverter
- C. Turn the ignition off, wear regular leather gloves, and begin work on the housing
- D. Assume the system is safe because the engine is not running and the boom is down

19. A technician replaces a pitman arm on a steering gear. Why is it important to line up the index marks on the arm and sector shaft?

- A. To raise the power delivered by the engine to the steering pump
- B. To let the arm be installed in a reversed position on the sector shaft
- C. To reduce the number of steering wheel turns needed from lock to lock
- D. To keep the gear centred with the wheels straight ahead and stop the arm loosening

20. An ABS fault lamp on a dump truck comes on only on rough roads and sets an intermittent wheel speed sensor code for the left drive axle. What is the best diagnostic method?

- A. Wiggle test the harness and connectors along the axle while watching the signal
- B. Replace the electronic control unit first, before any further testing of the circuit
- C. Clear the code and ignore it unless the lamp stays lit all of the time
- D. Raise the tire pressure to cut the vibration reaching the sensor from the road

21. A bucket truck needs a PTO that can be engaged and disengaged with the engine running and without using the clutch. Which type is designed for this?

- A. A standard gear-shift PTO that meshes a sliding gear while the shaft is stopped
- B. A rear-mounted PTO driven from the tail shaft with a manual shift collar
- C. A side-mounted PTO that uses a hand-operated lever and has no clutch
- D. A hot-shift PTO with a wet clutch pack applied by air or oil pressure

22. A bucket truck runs its boom for an hour with the engine off every day, and its starting batteries are often too flat to crank. What is the correct long-term fix?

- A. Replace the starting batteries with a smaller pair that will charge faster after cranking
- B. Add a separate deep-cycle battery bank for the job-site loads, charged through an isolator
- C. Run the engine at idle for all of the boom work so the alternator keeps charging
- D. Disconnect the alternator so it no longer draws power from the starting batteries

23. A truck with a viscous-type fan drive loses its air supply and control signal to the fan clutch solenoid. What is the usual failsafe condition?

- A. The fan drive defaults to disengaged to reduce engine load
- B. The fan drive defaults to half speed using stored software values
- C. The fan drive defaults to full engagement to protect the engine from overheating
- D. The fan drive stays in whatever state it was in at the last command

24. A crane truck is parked to lift a load, and the operator notices overhead power lines running parallel to the boom path about 6 m away. What must happen before the boom is raised?

- A. Assume the lines are dead because their insulation looks intact, and raise the boom slowly
- B. Set the outriggers first, since grounding the truck makes any contact with the lines harmless
- C. Rely on the crane load chart, which lists the clearances needed around overhead power lines
- D. Confirm the safe limit of approach, contact the utility if needed, and post a signaller

25. A trailer with air-ride suspension settles to the ground overnight even though the brake system holds pressure. Which component is the most likely source of the air loss?

- A. A worn brake lining on the trailer axle that lets the brakes drag overnight
- B. A leaking air spring, fitting, or leveling valve in the suspension circuit
- C. A cracked trailer kingpin that lets the front of the trailer settle slowly
- D. A worn landing gear shoe that loses height as the trailer cools overnight

26. A crane boom lowers in jerky steps, and the system uses a counterbalance valve on the lift cylinder. What is the most likely cause?

- A. A worn engine thermostat that is keeping the hydraulic oil too cool
- B. Low air tank pressure that is weakening the signal to the valve
- C. Air in the circuit, or a counterbalance valve set wrongly for the load
- D. A cracked steering gear housing leaking power steering fluid into the circuit

27. After setting toe, the steering wheel spokes are off centre while the wheels point straight. Which adjustment should be made?

- A. Adjust the drag link length to centre the wheel without changing toe
- B. Change the tie rod length on one side only to rotate the steering wheel
- C. Add air to the left steer tire to turn the wheels back toward centre
- D. Replace the power steering pump to remove the offset in the steering gear

28. A voltage-sensing battery isolator joins the auxiliary battery to the main battery only after the engine is running. At about what battery voltage does it normally close?

- A. About 13.2 V, which indicates the alternator is charging
- B. About 10 V, which indicates the batteries are low
- C. About 12 V, which indicates the batteries are fully charged
- D. About 15.5 V, which indicates an overcharged system

29. An ABS modulator valve on a drive axle hisses continuously from its exhaust after the brake pedal is released. What is the most likely cause?

- A. A worn friction lining on the same axle giving too much brake torque
- B. A loose wheel bearing adjustment letting the hub move on the spindle
- C. A leaking or stuck solenoid or valve seat inside the modulator
- D. A plugged fuel water separator starving the air system of pressure

30. A hydraulic pump bolted directly to a PTO requires 450 N·m, but the PTO's rated output is 330 N·m. What is the correct approach?

- A. Increase engine speed so the torque rating of the PTO rises at the output
- B. Fit a PTO with a higher torque rating, or reduce pump displacement or pressure
- C. Install the pump anyway, because the published torque ratings are conservative
- D. Add a longer driveshaft between the PTO and pump to absorb the extra torque

31. A truck shows an engine coolant loss of about 1 L a day, no external leak, a faint sweet smell at the exhaust, and normal oil level. Which component should be pressure tested?

- A. The air-to-air charge cooler
- B. The fuel tank return line
- C. The air dryer purge valve
- D. The exhaust gas recirculation cooler

32. An A/C compressor clutch does not engage, although the system has power and the controls are on. The low-pressure switch is open. What should the technician do first?

- A. Bypass the switch with a jumper wire and run the compressor to test it
- B. Check the refrigerant charge with gauges, since the switch opens at low pressure
- C. Replace the compressor immediately because the clutch coil must have failed
- D. Add oil to the compressor through the service port with the engine running

33. An infrared thermometer shows a battery cable clamp at 95 °C while the other clamp is at 35 °C during cranking. What does the difference show?

- A. The battery is being overcharged by the alternator, heating one clamp only
- B. The starter motor has a short between its windings and heats the clamp
- C. The cable is too thick for the starter current and so heats one end
- D. High resistance at the hot connection, from corrosion or a loose clamp

34. Before beginning a front-end alignment on a tractor, which conditions should be checked?

- A. The alternator output and the condition of the batteries on the tractor
- B. The air dryer cartridge and the wear on the air compressor piston rings
- C. Tire condition, wheel bearings, kingpin and linkage play, and spring condition
- D. The fuel level in the tank and the engine oil temperature at idle

35. An engine with a closed crankcase ventilation system shows oil seepage at several seals and a lot of oil mist at the air intake. What service item should be inspected?

- A. The crankcase ventilation filter, which may be plugged past its interval
- B. The oil pressure relief valve, which may be stuck closed in its bore
- C. The thermostat, which may be opening too late for the coolant to warm up
- D. The fuel pressure regulator, which may be set too high for the injectors

36. A relay valve on a tandem axle continues to leak air at its exhaust port after the brakes are released, and the rear brakes are slow to release. What is the likely repair?

- A. Replace the brake drums on that axle with a heavier type of drum casting
- B. Adjust the air compressor governor to a lower cut-out pressure setting
- C. Fit a larger air dryer to remove the moisture that is causing the leak
- D. Clean and rebuild or replace the relay valve, then check for contamination

37. A driveline with a centre support bearing produces a vibration at highway speed. The rubber insulator of the support is cracked and the bearing has side play. What is the right repair?

- A. Replace the support bearing and insulator, then check alignment and mounting
- B. Add balancing weights to the driveshaft but leave the worn bearing in place
- C. Tighten the bracket bolts to remove the side play found in the bearing
- D. Fill the cracked insulator with silicone to stop the shaft from moving

38. A starter motor spins freely and noisily but does not turn the engine. The solenoid clicks and the battery is good. What part has most likely failed?

- A. The battery ground strap that connects the battery to the engine block
- B. The ignition switch contacts that carry power to the starter solenoid
- C. The starter drive overrunning clutch that engages the flywheel
- D. The alternator rectifier that supplies the solenoid circuit

39. A wiper motor on a plow truck blows its fuse during a snowstorm, and a technician finds the wiper blade frozen to the windshield. What is the best course?

- A. Fit a larger fuse so the motor can keep pushing against the frozen blade
- B. Free the ice from the blade, and check the linkage and the fuse
- C. Bypass the fuse with a jumper wire until the blades free themselves
- D. Replace the wiper motor with one that has a higher gear ratio and torque

40. A crane body is being mounted on a truck frame. Why is a subframe or mounting plate system used under the crane base?

- A. To raise the crane base so it can lift to a greater working height
- B. To remove the need for outriggers when lifting loads at the full boom
- C. To increase the engine power that is delivered to the hydraulic pump
- D. To spread the concentrated crane loads across the frame and prevent chassis twisting

41. An engine has an oil pressure of 70 kPa at hot idle on the dash, but the oil level is correct and the oil is the right grade. What is the best next step?

- A. Check pressure with a calibrated mechanical gauge at the oil gallery
- B. Replace the oil pump immediately, since the dash gauge is surely accurate
- C. Replace the oil with a thicker grade without any further checks of pressure
- D. Remove the main bearing caps to inspect the bearing clearance first

42. A shop needs a chain sling for overhead lifting of a 1,500 kg hydraulic crane component. Which chain marking is acceptable?

- A. Grade 43 high-test chain, since its links are heavy enough for the weight
- B. Alloy steel chain marked Grade 80 or Grade 100 with matching rated hooks
- C. Grade 30 proof coil chain, since it is the common shop chain
- D. Any galvanized chain that the supplier states is strong enough

43. A trailer ABS controller shows a flashing diagnostic lamp. How can the technician usually find the fault code without a scan tool?

- A. Disconnect the trailer from the tractor and wait ten minutes for a reset
- B. Count the number of tires with low pressure on the trailer axles
- C. Read the sequence of lamp flashes against the manufacturer's code chart
- D. Measure the voltage at the trailer marker lights while braking

44. A hydraulic motor driving a spreader conveyor runs slowly. A technician measures high flow from the case drain line of the motor. What does this show?

- A. A normal condition, since case drains always carry high flow at full load
- B. Excessive internal leakage from motor wear, so it needs repair or replacement
- C. A restricted pump inlet filter that is starving the motor of oil
- D. A weak battery in the control circuit that slows the motor's solenoid

45. The yellow parking brake control on a crane carrier pops out about twenty minutes after the truck is parked with the system fully charged. Which condition is most likely?

- A. An air leak in the spring brake circuit or the parking control valve
- B. A leak in the primary service circuit at the front brake chambers
- C. A worn lining on one rear brake shoe that lets the brake drag
- D. A sticky governor that cuts in at too high a pressure setting

46. A driveline slip yoke has worn splines. Which symptom does this cause?

- A. A whining noise that occurs only when the transmission is in neutral
- B. A grinding noise that occurs when the clutch pedal is pressed
- C. A hissing noise heard from the air dryer
- D. A clunk when accelerating or decelerating and a vibration from spline backlash

47. An alternator produces no output. The belt is tight and the wiring appears fine. What should be checked first at the regulator?

- A. That the engine oil pressure is above 400 kPa at idle with the engine warm
- B. That the air tank pressure is above 690 kPa when the engine is running
- C. That the ignition-switched excitation voltage reaches the alternator's excite terminal
- D. That the transmission is in neutral and the PTO is not engaged

48. A technician replaces injector four after a cylinder balance test shows a weak cylinder. The engine still runs rough. Which step was probably missed?

- A. Resetting the battery clock so the module relearns fuel quantity
- B. Washing the injector bore with solvent to remove fuel from the seat
- C. Installing a new turbocharger actuator to compensate for fuel delivery
- D. Entering the new injector's calibration trim code into the engine control module

49. An evaporator ices up and airflow from the vents drops after a short time. Which condition should be checked first?

- A. Airflow restriction, such as a clogged filter or weak blower, and the expansion device
- B. The fifth wheel lubrication and the condition of its locking jaws
- C. The brake chamber diaphragm and the pushrod stroke at each wheel
- D. The turbocharger boost pressure and the condition of the charge cooler

50. An air suspension leveling valve linkage is bent on a truck, and the vehicle rides high on one side. What is the correct repair?

- A. Add a second compressor to the air supply so the springs fill faster
- B. Straighten or replace the linkage and reset the ride height to specification
- C. Replace both air springs and leave the leveling valve as it is
- D. Disconnect the linkage and let the springs settle to their own height

51. A battery-electric truck charges slowly in very cold weather, and the display shows battery heating active. What explains this behaviour?

- A. The charger is damaged and delivers only a fraction of its rated power
- B. The 12 V battery is overcharged by the converter during the charging session
- C. The battery management system limits charge current in the cold while the pack warms
- D. The tires are under-inflated, so the pack cannot accept a full charge

52. After replacing a spring brake chamber on a plow truck, how can the technician confirm that the new chamber is not left caged?

- A. Check that air pressure is present at the chamber port with the parking brake applied
- B. With full air, release the parking brake and confirm the caging bolt is out
- C. Look at the dust boot for dirt and assume the bolt is free if it is clean
- D. Run the truck at idle for ten minutes and check the chamber temperature by hand

53. A drive axle's oil seals are leaking at the pinion and wheel ends, and the axle breather is found plugged with dirt. What is the best action?

- A. Replace only the seals and leave the breather as it is
- B. Overfill the axle with oil so the seals stay wet
- C. Clean or replace the breather and replace the damaged seals
- D. Seal the breather hole so that dirt cannot enter

54. Two beacon lamps are wired in parallel across a 12 V supply, one with 6 ohms resistance and the other 3 ohms. What is the combined resistance?

- A. 9 ohms
- B. 4.5 ohms
- C. 1.5 ohms
- D. 2 ohms

55. A used-oil analysis on a snow plow truck shows a very high silicon level with normal wear metals. What is the most likely cause?

- A. Dirt entering through the intake, such as a loose filter housing or damaged hose
- B. Fuel dilution from a leaking injector seat that is thinning the crankcase oil
- C. Coolant entering the oil through a failed oil cooler core or head gasket
- D. Overheating of the oil from a low coolant level in the cooling system

56. A tandem dump truck has a liftable tag axle. What is the correct practice before raising the loaded dump body?

- A. Leave the lift axle raised to reduce tire wear while the body is dumping
- B. Lift all axles with air pressure so the truck sits level during dumping
- C. Lower the lift axle and follow the manufacturer's stability instructions
- D. Raise the air suspension pressure to its maximum value before dumping

57. A technician uses a DC clamp-on ammeter around a battery cable to check cranking current. What must be done before taking the measurement?

- A. Open the battery disconnect so that the cable is unloaded before clamping
- B. Set the meter to AC volts because that gives the strongest signal on a cable
- C. Clamp around both the positive and negative cables together for a total reading
- D. Zero the meter with the jaws empty and match the arrow to current flow

58. A dial indicator with a magnetic base is set against a PTO driveshaft while the shaft is turned slowly by hand. What does the movement of the needle show?

- A. Shaft runout, which indicates a bent tube or an out-of-round journal
- B. Shaft endplay, which indicates worn thrust washers inside the pump
- C. Shaft torque, which indicates the strength of the PTO coupling
- D. Shaft balance, which indicates how much weight is missing from the tube

59. The lamps on a trailer are dim, and the seven-way plug pins show green corrosion. What is the best repair?

- A. Fit larger bulbs in every lamp to make up for the voltage drop at the plug
- B. Clean or replace the plug, check pin tension, and apply dielectric grease
- C. Spray water on the pins to rinse off the corrosion, then plug the trailer in
- D. File the pins until they are bare and leave them unprotected from road spray

60. An outrigger on a crane truck slowly creeps down under load with the control valve in neutral. The circuit uses a pilot-operated check valve. What is the likely cause?

- A. A worn thermostat in the engine cooling system letting oil temperature rise
- B. A cracked windshield on the cab letting moisture reach the control lever
- C. A low tire pressure on the front axle shifting the outrigger load
- D. A leaking seat in the pilot-operated check valve, or a leaking piston seal

61. A tractor's red trailer supply knob pops out immediately each time it is pushed in with a trailer connected, but stays in with no trailer attached. What is the likely cause?

- A. A failed tractor air compressor that cannot keep up with the trailer demand
- B. A major leak in the trailer emergency line or brake system dropping the pressure
- C. A frozen drain valve on the front tractor air reservoir holding the pressure
- D. A misadjusted foot valve that applies the trailer brakes when the knob is pushed

62. A drive axle ring gear has 41 teeth and the pinion has 11 teeth. What is the approximate axle ratio?

- A. 3.73 to 1
- B. 0.27 to 1
- C. 4.51 to 1
- D. 2.73 to 1

63. An engine with a speed limit programmed for PTO operation will not exceed 1,400 rpm when the PTO is switched on. What is this feature called?

- A. A parasitic limiter that switches off engine accessories above a set speed
- B. A turbo protection mode that lowers boost pressure at high engine loads
- C. A PTO governor, or maximum PTO speed setting, in the engine module
- D. A road speed governor that limits the vehicle speed while in gear

64. A torque rod bushing on a drive axle is badly worn. Which symptom is typical?

- A. Axle shifting and poor tracking, with uneven tire wear and wander under torque
- B. A hissing from the brake relay valve each time the axle moves up and down
- C. A lighting circuit fault in the trailer connector whenever the truck pulls hard
- D. A low-voltage warning from the alternator while the truck is driving loaded

65. After fitting LED turn-signal lamps to a trailer-pulling truck, the flasher rate is fast and the bulb-out warning shows. What is the correct correction?

- A. Replace the signal switch with a heavier switch rated for higher current
- B. Fit an LED-compatible flasher, or add load resistors to match the current draw
- C. Increase the battery voltage by adding a second alternator to the engine
- D. Remove the flasher so that the lamps simply remain on all the time

66. A truck stalls and will not restart. The scan tool shows no crankshaft position signal but a good camshaft signal. What can be expected on many engines with both sensors?

- A. The engine cannot start under any condition without the crankshaft sensor signal
- B. The engine starts only if the starter is held engaged for a long time
- C. The engine runs normally with no change in cranking time or performance
- D. The engine can start and run on the camshaft signal, with longer cranking

67. An automatic drain valve on a snow plow truck's wet tank sticks open in freezing weather and bleeds air. What is the best fix?

- A. Remove the valve and plug the drain port to stop the air leak entirely
- B. Install a larger compressor to keep up with the air that bleeds away
- C. Replace it with a heated valve, or clean and repair the valve seat
- D. Open the manual drain after each shift and leave it open overnight to dry

68. An automatic transmission slips only in third gear. All other gears hold properly. Which diagnostic step is most useful?

- A. Check the application pressure of the clutch pack used in third gear
- B. Replace the torque converter without any further pressure testing of circuits
- C. Change the transmission fluid and filter, and then ignore the slip
- D. Increase the line pressure to its maximum setting to stop the slip

69. A technician wants to check whether a cab door seal compresses evenly after replacing it. Which simple test is suitable?

- A. Hose the door from the inside and look for water showing outside
- B. Rattle the door by hand and listen for any metal-on-metal sound
- C. Measure the gap between door and body with a tape at one single point
- D. Close the door on a paper strip at several points and feel for even drag

70. Gauges on a running A/C system show a high low-side pressure and a low high-side pressure. What does this pattern indicate?

- A. An overcharged system with a condenser that is blocked by debris
- B. A compressor not pumping well because of internal wear or damage
- C. A restriction at the inlet of the expansion valve on the high side
- D. A very low refrigerant charge, with air mixed in the system lines

71. A technician crimps a new terminal on a spreader motor wire. Which method confirms the crimp is sound?

- A. Soldering over the crimp barrel so that the strands are held together
- B. Squeezing the terminal with pliers until the wire cannot be moved
- C. A gentle pull test, using the correct tool and die for the terminal size
- D. Wrapping several layers of electrical tape over the crimp barrel

72. A technician finds that a sway bar bushing is worn, with the bar free to move. Which symptoms are most likely?

- A. Clunking over bumps and increased body roll when cornering
- B. Loss of power in the engine at high speed
- C. Overheating of the transmission fluid
- D. Water leaking from the cab at the door seals

73. A technician is asked what the harmful effect of long idling on a diesel engine under low load is. Which answer is correct?

- A. The engine oil becomes too thin because of the very high combustion temperatures
- B. The turbocharger overspeeds because of the reduced exhaust flow at idle
- C. The cylinder liners expand and begin scuffing the pistons at light load
- D. Incomplete combustion leaves carbon and unburned fuel behind, called wet stacking

74. A technician finds a Type 24 brake chamber on one side of a front axle and a Type 20 chamber on the other. What is the problem with this arrangement?

- A. Both chambers give the same force as long as the air pressure is the same
- B. The Type 20 chamber wears faster but the braking stays balanced side to side
- C. Unequal chamber areas give different brake forces, so the truck pulls when braking
- D. The pushrod stroke becomes longer on the Type 24 chamber only, with no pull

75. An automatic transmission fluid sample is pink and milky, and the transmission has shifting problems. What is the likely source of contamination?

- A. Overfilling of the transmission by a few millilitres of fresh fluid
- B. A leak in the transmission oil cooler letting engine coolant into the fluid
- C. Dirt entering the transmission through a blocked breather during a wash
- D. Normal condensation after a cold start that collects in the pan

76. An apprentice on a bucket truck job wants to jumper the PTO interlock switch because it is slow to engage in cold weather. What should the mentor do?

- A. Allow the jumper for the day as long as the apprentice stays clear of the PTO
- B. Tell the apprentice to ignore the delay because it is only a comfort feature
- C. Explain that the interlock protects people, then diagnose and repair the switch circuit
- D. Remove the interlock from the circuit and note it for the next service visit

77. A flatbed trailer carries a 20,000 kg load that is secured with tie-downs. According to the national cargo securement standard, what is the minimum aggregate working load limit of the tie-downs?

- A. 5,000 kg, which is a quarter of the cargo weight
- B. 20,000 kg, which is the full cargo weight
- C. 40,000 kg, which is twice the cargo weight
- D. 10,000 kg, which is half the cargo weight

78. A spreader truck uses a flow divider to feed two hydraulic motors. What is the purpose of the flow divider?

- A. To increase the system pressure above the relief valve setting for the motors
- B. To split the pump flow in a set ratio between the two motors
- C. To reduce the viscosity of the hydraulic fluid as it passes to the motors
- D. To filter the fluid before it returns to the tank from both of the motors

79. A salt spreader truck has frequent electrical faults, and the main ground stud on the frame is covered with white and green corrosion. What is the correct repair?

- A. Clean to bare metal, tighten to specification, and seal the connection from moisture
- B. Spray the corroded stud with water to dissolve the salts, then tighten it
- C. Add a second ground wire in parallel, without cleaning the corroded stud
- D. Paint over the whole stud and cable lug to stop further corrosion

80. After coupling a tractor and trailer, the driver performs a tug test. What does this test confirm?

- A. That the trailer brake chambers have the correct pushrod stroke at each wheel
- B. That the trailer tires are inflated to the correct pressure for the load
- C. That the fifth wheel jaws are locked on the kingpin
- D. That the tractor protection valve is set to close at the right pressure

81. A technician sees a whistling sound and low boost from a turbocharged engine. The noise stops when the throttle is released. Where is the likely fault?

- A. A plugged fuel filter in the supply line that starves the injection pump
- B. A leak at the exhaust manifold gasket or a charge air hose connection
- C. A worn thermostat in the cooling system that holds the engine too cool
- D. A faulty air dryer in the brake system that is purging too often

82. A truck will not crank while a PTO is engaged, though it cranks normally with the PTO off. What is the most likely explanation?

- A. The battery has lost half of its cold cranking amps since this morning
- B. The starter solenoid has an open coil that opens only with the PTO on
- C. The fuel pump has lost its prime whenever the PTO switch is turned on
- D. A starter interlock that blocks cranking while the PTO is engaged, working as designed

83. A brake chamber has an effective diaphragm area of 125 square centimetres and receives air at 600 kPa. What approximate force acts on the pushrod?

- A. 7,500 N
- B. 750 N
- C. 75,000 N
- D. 4,800 N

84. An automated manual transmission will not shift out of neutral on a cold morning and sets a shift actuator fault. Which supply check is most useful?

- A. The engine oil level on the dipstick, and the condition of the oil filter
- B. The brake pedal free play at the treadle valve and its return spring
- C. Air pressure supplied to the transmission control unit and shift actuator
- D. The ambient temperature sensor in the mirror and its wiring connector

85. An electric truck displays an insulation fault warning in wet weather. What is the most reasonable first check after proper high-voltage lockout?

- A. Replace the traction battery pack immediately, since the pack is the most likely source
- B. Clear the warning and continue operating the truck until the dry weather returns
- C. Increase the pack voltage using the charger setting so the fault clears
- D. Inspect the high-voltage connectors and cables for water, then test insulation resistance

86. A technician finds that the stud holes in a steel wheel are elongated and the nuts do not seat properly. What is the right action?

- A. Weld the stud holes closed and redrill them to the correct size
- B. Replace the wheel, because damaged stud holes cannot hold the clamp load
- C. Tighten the wheel nuts to a higher torque value than normal
- D. Use hardened washers under the nuts to fill the gap in the holes

87. A technician finds white crystalline deposits building up on a diesel exhaust fluid injector nozzle. Which condition most often leads to this?

- A. Exhaust temperatures too low to fully vaporize the injected fluid
- B. Using an engine oil that is too thick for the operating temperature
- C. Letting the fuel level fall too low in the tank during long shifts
- D. Running the engine with a worn drive belt on the accessory drive

88. A technician replaces an A/C compressor on a truck. How should the refrigerant oil be handled?

- A. Pour in a full bottle of oil regardless of the system size or capacity
- B. Leave the new compressor dry and rely on the oil already in the lines
- C. Use clean engine oil because it lubricates the compressor bearings very well
- D. Drain and measure the old oil, then add the specified quantity of the correct type

89. A 30 A blade-type automotive fuse is replaced. What colour is a standard 30 A ATO blade fuse?

- A. Green
- B. Red
- C. Blue
- D. Yellow

90. A medium-duty crane truck has an air-over-hydraulic brake booster. A technician must top up the hydraulic reservoir. Which fluid should be used?

- A. Automatic transmission fluid, because it is compatible with all rubber seals
- B. The brake fluid type marked on the reservoir cap, such as DOT 3 or DOT 4
- C. Engine oil of the same viscosity as the oil used in the hydraulic pump
- D. Any hydraulic oil that is used in the truck's PTO circuit on hand

91. A technician checks the lubricant level in a manual transmission. Which procedure is correct?

- A. Fill until oil runs out of the breather vent at the top of the case
- B. Fill until the dipstick reads half full with the engine running at idle
- C. With the truck level, oil even with the bottom of the fill plug opening
- D. Fill to a level one inch below the bottom of the fill plug opening

92. A technician finishes a road test on a plow truck with a hydraulic circuit complaint. Why should the repair order record the oil temperature and engine speed during the test?

- A. They document the test conditions and support the diagnosis and any warranty claim
- B. They show how long the road test took, for the labour billing on the invoice
- C. They allow the next driver to set the plow controls to the same values
- D. They replace the need to write down the original customer complaint at all

93. A technician slides the tandem on a trailer with a sliding suspension. Why must all locking pins be checked after sliding?

- A. Pins must be removed to let the tandem drift to its best position when driving
- B. Each pin must be fully seated, or the tandem can shift while driving
- C. Only one pin needs to be seated, since the others are there for decoration
- D. Pins only need to be checked at the start of the shift once each year

94. A hose on a work truck sat in the sun with a closed quick coupler, and the coupler will not connect. What is the likely cause and correct action?

- A. The coupler is worn out, so replace it immediately with a larger one
- B. The fluid has frozen, so heat the coupler with a torch until it frees
- C. Trapped pressure from expansion; relieve it using the manufacturer's procedure first
- D. The hose is too long, so cut it to a shorter length and refit it

95. A technician reads a differential pressure sensor value across the particulate filter of 0 kPa while the engine runs under load and the soot load calculation shows a high value. What is the most likely cause?

- A. Excessive engine compression that is causing a very high exhaust flow rate
- B. A weak battery supplying low voltage to the starter during regeneration
- C. A failed air compressor governor in the brake system near the exhaust
- D. Disconnected, plugged, or reversed tubes at the differential pressure sensor

96. A truck's dual tires are run 20 percent below the recommended pressure for a long period. What problem is the greatest risk?

- A. Sidewall flexing that creates heat and can cause tire failure
- B. Increased wheel bearing endplay at the hub from the higher sidewall load
- C. Reduced resistance in the brake air system because of the extra heat
- D. Higher fuel economy because of the larger contact area on the road

97. A heated mirror on a plow truck stays cold even though the switch and fuse are good. What should be checked next?

- A. The compressor discharge line temperature and the condition of the air dryer
- B. The brake chamber pushrod stroke and the slack adjuster on the front axle
- C. Voltage at the mirror connector and the element's resistance
- D. The engine coolant concentration and the thermostat opening temperature

98. Several unrelated sensors on a truck set low-voltage codes at the same time. What is the most efficient first check?

- A. The brake pedal travel switch alone, and its connector for corrosion
- B. The cabin air filter condition and the blower motor current draw
- C. The alternator belt tension only, since the voltage must be too low
- D. The shared five-volt reference supply, and its wiring for a short

99. A truck with a driveline retarder and ABS begins to lock a wheel on ice. What action does the ABS controller normally take with regard to the retarder?

- A. It applies the retarder at full power to slow the wheel down more quickly
- B. It signals the retarder to switch off, so it adds no wheel lock
- C. It does nothing at all, since the retarder is an independent system
- D. It locks the retarder on until the truck has come to a complete stop

100. A manual transmission jumps out of third gear when the truck is pulling hard. Which causes should the technician examine?

- A. A low air tank pressure showing on the dash gauge while the truck pulls
- B. Worn gear engagement teeth, a weak shift rail detent, or worn forks
- C. A cracked windshield and its seal that allows the cab to flex under load
- D. A blown fuse in the lighting circuit that also feeds the shift solenoid

101. A truck's engine oil pressure is normal at idle but falls well below specification at high rpm when hot. Which cause is most likely?

- A. A leaking head gasket that adds coolant to the oil as engine speed rises
- B. A slipping fan clutch that heats the oil excessively at high engine speed
- C. A blocked pickup screen, or a pump that cannot keep up at high rpm
- D. A tight valve lash setting that raises the demand on the oil supply

102. Why is an oscilloscope better than a digital multimeter for finding an intermittent glitch in a sensor signal?

- A. It measures resistance with higher accuracy than a multimeter at low values
- B. It supplies power to the circuit under test while the engine is running
- C. It applies a heavier electrical load to the sensor, so the fault appears
- D. It records rapid voltage changes over time, so brief dropouts show up

103. A technician checks the oil level in an oil-lubricated wheel hub. Which method is correct?

- A. With the truck level, check against the hubcap window mark or the fill plug
- B. Fill the hub until oil comes out of the vent hole at the cap edge
- C. Check only the colour of the oil by rubbing a drop between the fingers
- D. Add grease through the vent hole until the hub feels firm to the hand

104. A technician checks the water pump of a high-mileage truck and finds noticeable play in the shaft when pushed sideways by hand, with no leak at the weep hole. What should be done?

- A. Leave it in service until the weep hole actually starts to drip coolant
- B. Add a coolant sealant additive to the cooling system to quiet the pump
- C. Replace the pump, since bearing play leads to seal failure and belt damage
- D. Tighten the belt further to reduce the shaft movement at the pulley

105. A windshield fogs on the inside during cold weather even with the defrost selected. Which cause should be checked?

- A. The engine oil level and the condition of the oil filter on the engine
- B. The recirculation door position, and whether the A/C compressor engages in defrost
- C. The wheel nut torque on the front axle and the tire inflation pressure
- D. The trailer air line colour coding and the condition of the glad hands

106. A technician finds brake lining soaked with gear oil on a drive axle. What must be done?

- A. Wash the linings in solvent, let them dry, and refit them to the shoes
- B. Burn the oil off the linings by driving with the brakes lightly applied
- C. Sand the surface of the linings to restore the friction that was lost
- D. Replace the soaked linings and repair the leaking wheel seal first

107. A new clutch disc is installed and the truck chatters during engagement. The disc and pressure plate are new. What should the technician check?

- A. Flywheel flatness and surface, oil contamination, and pressure plate alignment
- B. The air tank safety valve setting and the compressor governor cut-out pressure
- C. The electrical connector of the license plate lamp and its ground wire
- D. The thickness of the rear brake lining and the condition of the drums

108. A fleet fits an aftermarket LED light bar to a plow truck by wiring it directly to the battery positive with an inline switch. Which improvement makes it safer and more reliable?

- A. Use a thinner wire so that the fuse blows sooner if there is a fault
- B. Wire the ground to the plow frame instead of the chassis for a shorter run
- C. Use a fused relay triggered from a switched circuit, plus a fuse at the battery
- D. Leave the switch in place but remove the fuse so the circuit cannot blow

109. A technician inspects a pintle hook on a trailer-towing truck. Which condition requires replacing the hook?

- A. Wear at the horn and latch beyond the manufacturer's limits, or any crack
- B. Light surface rust on the mounting plate and the bolt heads underneath it
- C. A small amount of grease around the latch and the horn of the hook
- D. Paint chipping off the outside of the housing after a season of use

110. A PTO pump bracket bolt marked 10.9 is missing. Which replacement is correct?

- A. An SAE Grade 5 bolt of similar diameter, since it is an easier size to find
- B. A metric 10.9 bolt of the same diameter, thread pitch, and length
- C. A plated metric 8.8 bolt, since strength differences are small
- D. A longer metric 4.8 bolt, since extra thread depth will make up for strength

111. A technician performs a breakaway test on a trailer. What should happen when the emergency (supply) line is disconnected at the tractor?

- A. The trailer brakes remain fully released so that the unit can keep rolling
- B. The trailer lights turn on at full brightness to warn following traffic
- C. The landing gear lowers by itself so the trailer is supported
- D. The trailer spring brakes apply automatically as the supply pressure drops

112. A fleet selects hydraulic oil for a plow truck that works in cold winters and warm summers. Which property helps the oil keep a stable viscosity over a wide temperature range?

- A. A high flash point only
- B. A low pour point only
- C. A high viscosity index
- D. A high acid number

113. A truck is sampled for coolant condition and the test strip shows a very low nitrite level. A wet-liner engine is in the fleet. What risk should be addressed?

- A. An overfilled coolant tank because of dilution from the added additive
- B. Excessive heat transfer at the radiator fins, which lowers the engine temperature
- C. Accelerated freezing of the coolant at room temperature in the surge tank
- D. Cavitation pitting of the cylinder liners, which an additive helps prevent

114. A truck has no dash lights and will not crank, though the battery reads 12.6 V at the posts. What should be checked first?

- A. The air dryer cartridge condition and the compressor discharge line
- B. The battery disconnect switch and the main power feed to the vehicle
- C. The tire pressure monitoring sensor batteries and the receiver unit
- D. The turbocharger actuator and its wiring harness at the engine

115. A technician performs a parking brake holding test on a loaded tractor-trailer. Which is the correct procedure?

- A. Apply the park brakes, release the service brakes, and pull against them at low throttle
- B. Apply the parking brakes and rock the unit by hand to see if it moves
- C. Park on a slope and see whether the unit rolls over the next minute
- D. Release the parking brakes and apply the service brake fully while idling

116. A driveshaft vibration changes in proportion to the speed of rotation and occurs once per revolution of the shaft. What does this typically indicate?

- A. A worn wheel bearing on the steer axle
- B. An unbalanced or bent driveshaft
- C. A misfiring cylinder in the engine
- D. A worn belt on the cooling fan

117. A technician measures the distance between the front edges of a pair of tires at 2,430 mm and the rear edges at 2,436 mm, at spindle height. What is the toe setting?

- A. 6 mm toe-in
- B. 6 mm toe-out
- C. 3 mm toe-in
- D. 12 mm toe-in

118. A battery-electric truck will not enter ready mode, and the dash is dim. The traction pack shows normal charge. What small battery should be tested?

- A. The starter motor windings and the solenoid contacts on the engine
- B. The alternator drive belt and the tensioner on the front of the motor
- C. The 12 V auxiliary battery that powers the contactors and modules
- D. The turbocharger actuator and its wiring harness at the motor housing

119. A technician finds black soot at the exhaust tip and a drop in power. The boost gauge shows only half the normal value. The air filter and charge piping are sound. What is the next check?

- A. The oil dipstick calibration marks and the level of oil in the pan
- B. The alternator output at idle and the battery voltage while running
- C. The brake chamber pushrod travel and the slack adjuster angle on the drive axle
- D. Turbocharger condition, including shaft play, wheel damage, and actuator operation

120. A belt noise appears when decelerating from high idle, and a technician finds the alternator pulley does not turn smoothly in one direction only. What does this suggest?

- A. A weak starter relay that is chattering during deceleration
- B. A failed overrunning alternator pulley or decoupler
- C. A worn thermostat housing that is vibrating against the pump
- D. A blocked fuel return line that is raising the fuel pressure

121. A truck's air-suspension driver seat slowly sinks to its lowest height while parked. What is the most likely cause?

- A. An air leak in the seat bladder, fittings, or height control valve
- B. A failed transmission range switch that is dumping air from the seat
- C. A worn steering gear sector shaft that is letting the cab drop
- D. A weak alternator output at idle that is lowering the seat air supply

122. A technician finds several missing teeth on the tone ring of a drive axle hub, and the ABS lamp is on. What is the correct repair?

- A. Bend the remaining teeth so that the sensor sees evenly spaced pulses again
- B. Increase the sensor gap to make up for the damaged section of the ring
- C. Disconnect the ABS controller so that the warning lamp turns off for good
- D. Replace the tone ring, set the sensor gap, and verify the signal with a diagnostic tool

123. A truck equipped with an electromagnetic driveline retarder has weak retarding at all switch positions. The retarder windings test normal. What should be checked next?

- A. The engine oil filter and its bypass valve on the left side of the block
- B. The fifth wheel lubrication plate and the condition of the locking jaws
- C. Supply voltage, grounds, and the relays or controller that feed the coils
- D. The cab door latch adjustment and the seal around the door glass

124. A steering wheel feels notchy and binds at certain angles while the power steering pump pressure is normal. Which component should be inspected?

- A. The brake treadle valve plunger, for a sticking return action
- B. The alternator regulator, for an intermittent charging fault in the circuit
- C. The steering shaft universal joints, for binding or wear
- D. The windshield washer pump, for a seized motor shaft or hose

125. The ECM reports a fault for low coolant level, but the radiator and surge tank are full. What is the best first step?

- A. Replace the water pump, since the low level must be caused by cavitation
- B. Check the level sensor wiring, connector, and the sensor itself
- C. Flush the cooling system immediately and refill it with new coolant
- D. Replace the engine control module, since the fault is probably in its program

126. A fuel-fired auxiliary cab heater starts and then shuts down with a flame-out fault after a few minutes. What should the technician check?

- A. The air brake treadle valve and the dash gauge pressure sender wiring
- B. The alternator belt tension only, and the voltage at the starter terminal
- C. The turbocharger wastegate and the intake manifold pressure sensor reading
- D. Combustion air intake, exhaust restrictions, fuel supply, and supply voltage

127. When testing a relay that contains a built-in suppression diode across the coil, why does polarity matter?

- A. The diode conducts in reverse, shorting the supply or burning out if polarity is wrong
- B. The contacts only close with the correct polarity, because the magnet is polarised
- C. The diode raises the coil voltage when the polarity is correct on the terminals
- D. The diode stores energy to keep the contacts closed for some time after release

128. A technician greases the slip yoke and universal joints of a PTO shaft on a spreader truck. Which method is correct?

- A. Add a single shot from the gun, since over-greasing damages the cap seals
- B. Grease until the joint cap bulges, to make sure the needle bearings are full
- C. Pump NLGI Grade 2 grease until fresh grease shows at the seals or spline relief
- D. Use light motor oil in the grease fitting so it reaches every bearing needle

129. A trailer tandem is slid forward on its rails by a technician to reposition the load. What effect does this have on axle loads?

- A. More weight is carried by the trailer tandem and less by the tractor's axles
- B. More weight is carried by the tractor's axles and less by the trailer tandem
- C. Weight is unchanged because the load depends only on cargo size
- D. All the weight moves to the kingpin and tractor steer axle

130. A hydraulic hose assembly has a working pressure rating of 20 MPa. Using the common 4 to 1 safety factor for hose burst pressure, what is the minimum burst pressure?

- A. 5 MPa
- B. 40 MPa
- C. 24 MPa
- D. 80 MPa

131. During a test on a dump truck's rear chambers, a technician applies the brakes fully and finds soapy water bubbling at the vent hole of one chamber. What does this show?

- A. The chamber is working normally and is simply venting spring pressure at the hole
- B. The service diaphragm in that chamber is leaking, so the chamber needs replacing
- C. The pushrod seal needs more lubricant to stop the air from escaping the housing
- D. The ABS modulator is applying too much pressure to the chamber during the test

132. A technician finds a U-joint bearing cap loose in its yoke, with a worn bore. What is the correct repair?

- A. Replace the yoke, because the bore cannot hold the cap securely
- B. Peen the edge of the worn bore to tighten the fit of the bearing cap
- C. Wrap the cap in shim stock and reinstall it so it sits snugly in the yoke
- D. Apply thread locking compound to the outside of the cap before pressing it in

133. A technician finds cupped, scalloped wear on the tread of a drive tire. Which cause should be inspected first?

- A. A defective air dryer that is allowing moisture into the brake chambers
- B. Worn shock absorbers, wheel imbalance, or loose parts letting the tire bounce
- C. A weak battery that is reducing the voltage reaching the ABS sensors
- D. A faulty marker lamp that is causing a short circuit in the wheel-end wiring

134. After a water pump replacement, an engine shows swinging coolant temperature and a cold heater, and the coolant level drops after each warm-up. What is the likely cause?

- A. A failed turbocharger oil seal that leaks oil into the coolant passages
- B. A weak battery that cannot power the fan clutch solenoid at idle
- C. Air trapped in the cooling system, needing the manufacturer's fill and vent procedure
- D. An overfilled crankcase that raises the coolant temperature during warm-up

135. A technician is asked why a 7 m wire run to a spreader motor needs a heavier gauge than a 2 m run carrying the same current. What is the correct reason?

- A. A longer wire produces more voltage, which the motor cannot use safely
- B. A longer wire stores charge that the spreader motor must work to remove
- C. A longer wire increases the amps drawn by the motor on every start-up
- D. A longer wire has more resistance, so the voltage drop at the motor is larger

Practice Exam 15: Answer Key and Explanations

1. **D** — Total power is two 60 W lamps plus two 36 W strobes, which is 120 plus 72, or 192 W. Current equals power divided by voltage, so 192 divided by 12 gives 16 A. A value of 192 forgets the division, and 12 or 8 amps result from adding only part of the load or dividing twice.
2. **B** — A diesel particulate filter burns off soot passively only when exhaust temperature is high enough, which needs real engine load. Long periods of light load keep temperatures low, so soot accumulates faster than it oxidizes. High idle does not raise boost enough to matter, does not reduce exhaust flow, and does not bake soot in place.
3. **C** — A plow adds load directly over the front axle. If it exceeds the rated capacity, springs sag and caster and steering geometry change, causing wander. Verifying axle ratings and spring capacity is the first check. Rear tire pressure, driveshaft balance, and the air dryer do not relate to front axle loading.
4. **D** — A cylinder that leaks at the rod seal cannot keep the shift fork pushed against the load, so the gear walks out of mesh. Rebuilding or replacing the cylinder cures it. Raising pressure above the regulator setting wastes air and risks damage, and the detent spring and switch are not the leak source.
5. **B** — Output speed equals engine speed multiplied by the PTO ratio, so 1,200 times 1.15 gives 1,380 rpm. Dividing by the ratio produces 1,043, which is the mistake of inverting it. The engine speed of 1,200 ignores the gear ratio, and 1,550 does not come from any correct arithmetic on these numbers.
6. **C** — The crowfoot lengthens the lever arm, so the bolt receives more torque than the wrench scale shows. Multiplying the target by wrench length over total length, 450 divided by 500, gives 270 N·m. Setting 300 would overtighten the bolt, and 333 reverses the ratio, which overtightens it even further. The correction applies whenever an adapter lengthens the wrench.
7. **A** — Landing gear gearboxes need correct lubrication, and operators must use the right speed range, low for loaded cranking. A noisy or hard-to-turn gear suggests dry or worn gears or a bent shaft. Wheel bearing play, the tractor's air dryer, and brake linings do not affect landing gear cranking. Check these first, since they are cheap and quick to confirm.
8. **D** — Load-sensing pumps vary displacement to match demand. With valves in neutral there is no load signal, so the pump produces just enough to hold standby pressure, which saves energy and heat. Full flow at relief pressure describes a fixed pump, and a complete stop would leave the circuit without readiness.

9. A — A relay is an electrically operated switch. A small current through the coil closes heavy contacts connected to the battery by thicker wire, so the dash switch and its wiring are not overloaded. A relay does not change the voltage or the load's current draw, and it has no energy storage role.

10. C — Fuel in oil points to injector leakage or fuel washing past the rings during post-injection used for regeneration, which is common on engines that idle or run light for long periods. The oil cooler carries coolant, not fuel. A turbo seal leak passes oil, not fuel, and a plugged breather raises pressure, not fuel content.

11. B — With both hoses hot, the heater core is getting coolant, so the missing heat is being lost in the air path. A blend door stuck mixing in cool air gives warm air instead of hot. Brake compressors, fuel return lines, and exhaust gaskets do not control cabin air temperature. Checking the actuator travel confirms it.

12. C — Steering gears are made with slightly tighter lash at the straight-ahead position, so adjustment is done at centre. Adjusting at the ends would make the centre too tight and cause binding or wander. Lash is not the same through the travel, and holding full lock relieves pump pressure against the stops.

13. D — At full application the arm and pushrod should form roughly a right angle, because that is where the lever gives its most effective and consistent torque. Departing far from 90 degrees reduces braking force and changes the stroke. Parallel or acute geometry would give much less or very uneven torque.

14. A — A PTO driven through the clutch turns with the input shaft gears, so the clutch must be released to stop them before the PTO gear meshes. Engaging it while they spin grinds the gears. Engaging at speed or high idle with the clutch engaged is the same error, and shutting down is unnecessary.

15. B — Cab mounts isolate the cab from frame vibration, and collapsed rubber loses that function. The mount should be replaced and the bolts tightened to the specified torque. A washer, sealant, or extra tightening does not restore the elasticity of the rubber and may overstress the mount or frame bracket. Loose rubber also lets the cab shake against the frame.

16. C — Alternators produce only a fraction of their rating at idle, so heavy lighting loads can exceed output. A higher idle speed during plowing or a higher-output alternator fixes the deficit. A bigger battery only delays the discharge, removing the regulator risks overcharging, and disconnecting a battery reduces reserve. Idle output limits are the real constraint here.

17. B — With the truck parked there is no ramming air through the radiator, so cooling depends entirely on the fan. A fan clutch that is slipping or not commanded on gives exactly this stationary overheating. The exhaust brake is not applied, the air compressor adds little coolant heat, and a wastegate has no effect on coolant temperature.

18. A — High-voltage components can stay energized after the engine stops, and an electric PTO inverter holds stored charge. The procedure is to isolate the system, wait for the capacitors to discharge, and prove zero volts with an appropriately rated meter while wearing the right protective equipment. A 12 V disconnect alone does not make it safe.

19. D — The sector shaft has splines with a master mark so the arm can be installed in one correct position, which keeps the gear's centre aligned with the straight-ahead wheels. A wrongly indexed arm gives off-centre steering and poor linkage geometry. Alignment marks do not change pump power or total steering turns.

20. A — An intermittent code that appears only with vibration usually points to a chafed wire, loose connector, or damaged sensor lead. Moving the harness while watching live data shows where the signal drops out. Replacing the control unit first is an expensive guess, and clearing codes or changing tire pressure does not address the circuit.

21. D — A hot-shift PTO uses a wet multi-disc clutch applied by pressure, so the output can be engaged with the engine running and the vehicle stopped, without clutch pedal use. Sliding-gear PTOs and hand-lever types must be engaged with the gears stopped, and a tail-shaft PTO is a different mounting arrangement.

22. B — Starting batteries are designed for short, high-current loads and are damaged by deep discharge. Job-site loads should run from deep-cycle batteries isolated from the starting circuit, so cranking power is always preserved. A smaller battery pair would be worse, idling wastes fuel, and disconnecting the alternator removes charging. Cranking reserve matters most on cold mornings.

23. C — Most heavy-duty fan clutches are built to fail on, so the fan runs at full engagement if signal or air is lost. That costs fuel and noise but prevents engine damage from overheating. A failsafe that disengaged the fan would let the engine overheat unnoticed under load. Fail-safe design favours engine protection over fuel economy.

24. D — Provincial regulations set minimum distances to energized conductors, and insulation on overhead lines is never treated as protection. The operator confirms the limit of approach, involves the utility when the boom could come close, and uses a signaller. Grounding through outriggers does not make contact survivable, and load charts do not address electrical clearances.

25. B — The suspension air system is separate from the brake system, so a trailer whose brake system holds but whose ride height drops has a leak in the suspension circuit: springs, lines, fittings, or leveling valve. Brake linings, kingpins, and mud flaps do not hold or lose air. Isolating the suspension circuit with a gauge locates the leak.

26. C — A counterbalance valve holds the load and meters its descent using pilot pressure. Air in the oil or a wrong setting causes it to open and close repeatedly, so the boom moves in steps. Steering gear, thermostat, and air tank pressure are not part of the boom circuit. Bleeding the circuit and checking valve settings resolves it.

27. A — The drag link connects the pitman arm and steering arm, so changing its length rotates the steering wheel relative to the wheels without touching toe. Tie rod changes alter toe, tire pressure has no effect on wheel position, and the power steering pump has no influence on the spoke position.

28. A — A smart isolator closes when voltage rises above about 13.2 V, showing the alternator is charging, and opens again when it falls so the auxiliary loads cannot drain the starting battery.

Thresholds of 10 or 12 V occur with discharged or resting batteries, and 15.5 V would be an overcharge condition.

29. C — Air should stop flowing out of the modulator exhaust once the brake has released. Continuous hissing points to a leaking seat or a solenoid that does not seal, so the modulator needs service or replacement. Worn linings, bearing adjustment, and fuel filters do not control air flow at the exhaust port.

30. B — PTO ratings are limits on the torque that gears and shafts can safely carry, and exceeding them risks tooth breakage or shaft failure. Using a higher-rated PTO or a smaller pump or lower pressure keeps the load within limits. Higher speed does not raise torque capacity, and a longer shaft does not absorb torque.

31. D — An internal leak in the EGR cooler lets coolant pass into the exhaust stream, which explains disappearing coolant with no external drip and a sweet smell. The charge cooler and fuel return line do not contain coolant, and the air dryer purge valve is part of the brake air supply.

32. B — Low-pressure switches protect the compressor from running with too little refrigerant and oil circulation. An open switch usually means a low charge or leak, so the technician checks the pressure first. Jumping the switch can damage the compressor, and replacing it or adding oil does not address the cause. Gauges confirm the real condition quickly.

33. D — A connection that becomes much hotter than its neighbours is converting electrical energy into heat through high resistance, usually from corrosion or looseness. Cleaning and retightening it cures the problem. An overcharged battery would heat the case, a shorted starter would show high current draw, and a thicker cable runs cooler.

34. C — Alignment readings are only meaningful if the front end has no looseness or damage. Tires, wheel bearings, kingpin bushings, tie rods, drag link ends, and springs must be sound before measurements are taken. Electrical and brake air components do not affect alignment readings. Skipping these checks gives readings that misdirect the adjustment, wasting time and tires.

35. A — A plugged crankcase ventilation filter lets pressure build up inside the engine, pushing oil past seals and into the intake. Replacing it at the interval restores normal venting. A stuck relief valve affects oil pressure, not blow-by, and thermostat or fuel regulator problems do not cause crankcase pressure. Servicing the filter is a routine maintenance item.

36. D — A relay valve that does not seat after release is held open by contamination, dirt, or a worn seal, which keeps air flowing to the exhaust and delays release. Servicing or replacing it and finding the source of contamination fixes the problem. Drums, governor settings, and dryer size do not control relay valve seating.

37. A — A cracked rubber mount and a bearing with play let the shaft centre move, which causes vibration. The support bearing and insulator are replaced together, and mounting and alignment are checked. Balance weights cannot compensate for a failing support, and tightening a bracket or adding silicone does not repair worn parts.

- 38. C** — A starter armature that spins without turning the engine means the drive mechanism, usually the overrunning clutch, is slipping or the drive is not engaging the ring gear. A bad ground or switch would give slow or no rotation, and an air dryer heater has nothing to do with starting.
- 39. B** — A wiper stuck in ice forces the motor to stall and draw high current, which is exactly what the fuse is there to stop. Clearing the ice, checking the linkage, and keeping the fuse at its rating protect the wiring and motor. Larger fuses and jumpers risk burning the wiring, and a new motor does not remove ice.
- 40. D** — A crane delivers large local forces through its base, which can overload frame rails if bolted directly. A subframe or mounting system distributes loads and maintains torsional behaviour, following the crane and chassis maker's guidance. It does not give lift height, replace outriggers, or boost power. Following the manufacturer's mounting guide also protects warranty and stability.
- 41. A** — Dash gauges and sender units fail often, so a doubtful reading is verified with a mechanical gauge at the gallery before expensive repairs. If the actual pressure is within specification, only the sender or wiring needs repair. Replacing the pump or changing grade without proof is guesswork, and bearing inspection is a late step.
- 42. B** — Only alloy chain, Grade 80 or Grade 100, with a legible working load limit tag is approved for overhead lifting, and the hooks and fittings must carry the same grade. Grade 30 and Grade 43 chains are carbon steel intended for tie-downs and towing, and appearance or galvanizing says nothing about lifting capacity.
- 43. C** — Many trailer ABS units report faults by flashing their lamp in a coded pattern, which the technician decodes with the manufacturer's chart, or use diagnostic tools. Waiting after disconnecting, counting tires, or checking marker lamp voltage gives no information on stored faults. A scan tool is not always required, and the lamp sequence is the first clue.
- 44. B** — A motor's case drain should carry only a small leakage flow. Large flow means oil is bypassing the internal parts, so the motor cannot develop speed and torque. Case drain flow is measured to judge wear. It is not normal at high volume, and filter or battery problems would not show in the drain line.
- 45. A** — The parking control valve closes and holds the spring brake circuit pressure. If the pressure falls below its threshold, the valve pops out and the brakes apply. A leak in the spring brake circuit or the valve itself is the cause. Service circuit leaks and lining wear do not drain the parking circuit.
- 46. D** — Worn splines allow rotational lash between the yoke and the shaft, so the driveline snaps taut when torque reverses, giving a clunk and sometimes vibration. A neutral whine is a transmission issue, noise on pedal application is clutch related, and a hiss from the air dryer belongs to the brake air system.
- 47. C** — Many heavy-duty alternators need a small current through the field, supplied from an ignition circuit, to start charging. If the excitation signal is missing, there is no output even with a good alternator. Oil pressure, air pressure, and transmission position are not part of the excitation circuit. Testing the excite circuit takes only a voltmeter.

48. D — Modern common-rail injectors are individually calibrated, and the trim code must be programmed into the module so it can correct fuel delivery for that unit. Without it the cylinder can run rough or smoke. The clock has nothing to do with fuel quantity, solvent in the bore harms the seat, and turbo actuators are unrelated.

49. A — An evaporator freezes when airflow is too low or the refrigerant flow is not controlled correctly, so a clogged filter, weak blower, or faulty expansion device is likely. Fifth wheel lubrication, brake chambers, and boost pressure have no effect on the evaporator temperature. Checking airflow first is the quickest and cheapest step, before any refrigerant work.

50. B — The leveling valve senses axle position through its linkage and adds or exhausts air to maintain ride height. A bent or misadjusted linkage sets the wrong height, and fixing and resetting it to the specified dimension restores it. A second compressor, new springs, or no linkage do not correct the height.

51. C — Lithium cells can be damaged if charged fast when very cold, so the battery management system limits current and heats the pack first. Slower charging in cold weather is normal. A faulty charger would give a fault message, and the 12 V battery and tire pressure do not control the pack's charge rate.

52. B — A caged spring brake keeps the spring compressed and so the brake stays released even when parked. The technician must make sure the caging bolt is fully backed out, the spring brake applies when air is exhausted, and the pushrod moves freely. Appearance and temperature checks do not prove the state of the spring.

53. C — A blocked breather lets heat expand the oil and air without any relief, and the resulting internal pressure pushes oil out past seals. The breather must be cleaned or replaced along with the leaking seals. Overfilling raises pressure further, and sealing the vent removes the pressure relief entirely. Plugged breathers are routine items missed in service.

54. D — For parallel resistors, the product over the sum applies for two values, so 6 times 3 divided by 6 plus 3 gives 18 over 9, which is 2 ohms. Adding them gives 9 ohms, which is the series answer. Averaging gives 4.5, and 1.5 is simply wrong. Parallel total is always lower than the smallest branch.

55. A — Silicon in oil comes mostly from dust, and when other wear metals are normal the usual source is unfiltered air getting past a damaged intake component. Fuel dilution would show as low viscosity, coolant would show sodium or potassium and glycol, and overheated oil would show oxidation rather than silicon.

56. C — A loaded body raised on a truck with its lift axle up reduces the support base and can destabilize the truck. The axle should be lowered and the manufacturer's procedures for stability followed, usually on level ground. Raising axles or overpressurizing the suspension reduces stability. Stability is the reason the manufacturer publishes a procedure.

57. D — Hall-effect clamps read small stray magnetic fields, so they must be zeroed before use. The arrow on the jaw shows current direction, so the sign of the reading is meaningful. Opening the

disconnect would remove the current, AC volts is the wrong function, and clamping both cables cancels the field to zero.

58. A — A plunger resting on a rotating shaft records how far the surface moves toward and away from the gauge each revolution, which is runout. A bent tube or damaged journal shows up this way. Endplay needs axial movement with the plunger on the shaft end, and the dial cannot read torque or balance.

59. B — Corroded contacts add resistance and reduce voltage to the lamps. Cleaning or replacing the plug, checking that the pins grip firmly, and applying dielectric grease restores connection and slows corrosion. Bigger bulbs raise the current draw, water spreads salts, and bare filed pins corrode quickly again. Clean contacts also cut heat at the plug.

60. D — A pilot-operated check valve locks oil in the cylinder when the control valve is neutral. If its seat leaks, or the piston seal leaks inside the cylinder, the outrigger drifts down. The thermostat, windshield, and tire pressure have no effect on the oil that supports the outrigger. The leak path is inside the valve or cylinder.

61. B — The trailer supply valve closes when pressure falls below roughly 140 to 310 kPa. With no trailer it holds, but a trailer with a large leak, or an emergency line that drops pressure, makes it pop out when connected. A weak compressor or frozen drain would show up on the gauges, not as a trailer-only fault.

62. A — Axle ratio equals ring gear teeth divided by pinion teeth, so 41 divided by 11 is about 3.73. Dividing the other way gives 0.27, the reciprocal. Multiplying the tooth counts gives 451, from which 4.51 is a misreading, and subtracting gives 30. The ratio is a simple quotient with the ring gear on top.

63. C — Engine modules let technicians programme a PTO mode with a maximum engine speed and sometimes a set speed, which protects pumps and gearing and keeps work at a consistent rpm. A road speed governor works on vehicle speed, and turbo protection and accessory limiting are different functions. The setting is usually adjustable with a service tool.

64. A — Torque rods locate the axle front to back and keep it square to the frame. Worn bushings let the axle shift under power or braking, so tracking and tire wear suffer. Brake valve noise, trailer lighting faults, and charging warnings come from other systems. Pry tests on the bushings confirm the wear.

65. B — Standard flashers time themselves by sensing the current of incandescent lamps. LEDs draw far less, so the flasher rate rises and bulb-out detection trips. An electronic LED flasher or load resistors restore normal operation. A new switch, higher voltage, or removing the flasher does not give legal signals. Legal turn signals must flash at a steady, specified rate.

66. D — Most heavy-duty engines have a backup strategy. If one speed signal is lost, the module uses the other to determine position, and the engine may start slowly and run in a limited way. A truck that stalled with both lost would not start. Normal cranking with no change is also unlikely.

67. C — A stuck-open drain valve leaks continuously and runs the compressor. A heated automatic drain or a cleaned, repaired valve both prevent freezing and still remove moisture. Plugging the drain

traps water that can freeze and damage components, and leaving drains open or increasing compressor size does not solve the cause.

68. A — Slip in one gear points to the clutch pack or seal circuit applied in that gear, so a pressure test at that clutch circuit shows whether the leak is in a seal, a clutch, or its feed. Replacing the converter or raising line pressure without testing is guesswork, and ignoring the slip lets damage grow.

69. D — A paper strip pinched at several points around the seal shows if compression is consistent, since a loose area lets the paper slide out freely. Spraying water on the inside will not show a leak path from the outside, and hand rattling or a single gap measurement does not test seal compression.

70. B — When the compressor is worn, it cannot build pressure on the high side, and the pressure cannot be pulled down on the low side, so the two readings approach each other with high low-side and low high-side values. Overcharge, restriction, and low charge produce other gauge patterns. A leak or restriction would show different readings.

71. C — A proper crimp uses the correct die to cold-weld the wire strands to the barrel, and a gentle pull test shows if the crimp is secure. Soldering over a crimp makes the wire brittle at the end and can crack under vibration, pliers deform the terminal, and tape hides defects without improving connection.

72. A — The stabilizer bar limits body roll by transferring load between wheels, and worn bushings create looseness. The result is a clunk when the bar moves, and more roll in turns. Engine power, transmission temperature, and door seal leaks are not tied to stabilizer bar bushing wear. Replacing the bushings quiets the noise and restores roll control.

73. D — At light load, combustion chamber temperature is low, so fuel burns incompletely, leaving soot, fuel residue, and sometimes oil leaking into the exhaust, which is wet stacking. It shortens engine and aftertreatment life. Combustion is cooler, not hotter, so thin oil, turbo overspeed, and liner expansion do not follow. Higher loads clear the deposits.

74. C — Force equals pressure multiplied by effective area, so two different chamber sizes at equal pressure produce unequal force on the two wheels, and the truck pulls to the stronger side. Both sides of an axle must use identical chambers and slack adjuster lengths. Equal pressure does not mean equal force.

75. B — A milky pink appearance in automatic transmission fluid is a typical sign of coolant mixing through a cooler leak. Coolant ruins friction materials, so the unit usually needs an overhaul, with cooler replacement and a full flush. Slight overfill, dirt, or normal condensation do not give a pink emulsion. Flushing alone is not enough.

76. C — A mentor models safe practice. Interlocks prevent unexpected equipment motion, so bypassing one is never acceptable even temporarily. The mentor explains the hazard, then helps the apprentice find the real cause, such as a stiff switch or corroded connector, and repairs it. Removing or ignoring the interlock leaves the hazard in place.

77. D — National Safety Code cargo securement rules require the total working load limit of the tie-downs, added together, to be at least 50 percent of the weight of the cargo. For a 20,000 kg load that is 10,000 kg. A quarter would be too little, and the full weight or double is not required.

78. B — A flow divider sends set portions of flow to each branch, so two motors on different loads stay near the same speed. It does not raise pressure above the relief setting, change viscosity, or filter oil, which are different functions. This keeps spreader augers and conveyors turning at matched speeds even when one side is loaded heavily.

79. A — Corroded connections add resistance that causes voltage drop and random faults. Cleaning all contact surfaces to bare metal, tightening properly, and then sealing the joint with a dielectric or protective compound restores a low-resistance path. Wetting, paralleling over corrosion, or painting before cleaning does not restore good contact. A sealed joint resists salt and moisture from returning.

80. C — After backing under, the driver applies the trailer brakes and gently pulls forward against them. If the coupling is not locked, the tractor moves away, so the test proves the jaws have closed on the kingpin. Brake stroke, tire pressure, and protection valve settings need separate checks. Visual checks alone can miss a half-closed jaw.

81. B — A whistle that appears under boost and disappears at closed throttle points to a pressurized leak, either exhaust gas escaping before the turbine or charge air escaping after the compressor. Both lower boost. Fuel filters, thermostats, and brake air dryers do not produce a boost-related whistle. Pressure testing the charge system locates it.

82. D — Some PTO installations include a safety interlock that stops the starter from engaging while the PTO is on, preventing sudden equipment motion at start-up. Normal cranking with the PTO off shows the starter and battery are fine. An open solenoid or weak battery would affect cranking regardless of the PTO.

83. A — Force equals pressure times area. Converting, 600 kPa is 600,000 Pa and 125 square centimetres is 0.0125 square metres, which multiply to 7,500 N. Moving the decimal gives 750 or 75,000 N, which are unit errors. A figure of 4,800 comes from dividing instead of multiplying. Always convert units before multiplying to avoid such errors.

84. C — Many automated manual transmissions use air to move shift forks, so a low or frozen supply, or a restriction in the line, can leave the unit stuck in neutral. Checking the air supply at the transmission is a logical first step. Oil level, pedal play, and the mirror sensor have no direct connection.

85. D — The system monitors resistance between high-voltage conductors and the chassis, and moisture or damage can lower it and set the warning. After isolating the system, the technician looks for contamination, then tests insulation resistance. Replacing the pack is premature, and clearing the warning ignores an electric shock hazard. Water in connectors is a common cause of such readings.

86. B — Elongated stud holes mean the wheel mounting surface is damaged, and the clamp load cannot be held reliably, so the wheel can work loose. Replacement is the only safe repair. Welding and

redrilling changes the metal properties, and extra torque or washers cannot restore a correct seat. Studs and nuts should also be inspected for damage.

87. A — When injected fluid does not fully vaporize because the exhaust is too cool, urea residue crystallizes on the nozzle and downstream pipe, which can restrict dosing. Fixing the cause may involve duty cycle or regeneration behaviour. Oil viscosity, tank fuel level, and belt wear do not form urea crystals. Longer drives at higher load usually clear them.

88. D — Compressors need the right oil in the right amount. Too much oil reduces cooling capacity and too little damages the compressor, so the quantity follows manufacturer guidance and replaces oil lost with the old part. Engine oil is not compatible, and running dry causes failure. Measuring the removed oil keeps the charge in balance.

89. A — Standard blade fuses follow a colour code: 10 A red, 15 A blue, 20 A yellow, 25 A natural or clear, and 30 A green. Matching rating and colour helps technicians confirm a replacement fuse is correct, which matters because a larger fuse can leave wiring unprotected. Replacing with a higher rating defeats circuit protection.

90. B — Brake hydraulics use glycol-based brake fluid with seals designed for it, and the grade is marked on the cap. Petroleum-based fluids such as ATF, engine oil, or PTO hydraulic oil attack rubber seals and cause brake failure. Using the specified fluid keeps the booster and wheel cylinders sealing correctly. Always match the fluid to the cap marking.

91. C — Manual transmissions are normally filled to the lower edge of the fill opening with the truck on level ground, which sets the right level for splash lubrication. Filling to the vent causes foaming and leaks, and the transmission has no dipstick used while running. A level below the opening starves upper gears.

92. A — A written repair order tells the story of complaint, cause, and correction. Conditions such as oil temperature and engine speed let another technician or a manufacturer reproduce and understand the result. They never replace the customer complaint, and test duration or driver settings are not the purpose of recording them.

93. B — A sliding tandem is held by several lock pins that must be fully engaged, usually confirmed by looking at each and making sure indicators are in position. A partly seated pin can let the tandem shift during braking, which is extremely dangerous. All pins matter, and the check is needed after each slide.

94. C — Oil in a closed hose expands as it warms in the sun, raising the pressure and holding the coupler poppets shut. The technician safely relieves the trapped pressure using the control levers or the manufacturer's method. Replacing the coupler, using a torch, or cutting the hose is unnecessary and unsafe.

95. D — Under load, exhaust flow is high, so a loaded filter should show a clear pressure difference. A zero reading with a high soot estimate suggests the sensor lines are disconnected, plugged, or swapped. Compression, battery voltage, and the air compressor governor have no connection to the sensor reading. Checking the hoses is quick and cheap before replacing the sensor.

96. A — A tire running with too little pressure flexes much more, building heat in the sidewalls and tread, and it can fail suddenly by separation or blowout. Bearing play, air system resistance, and fuel economy do not improve as a result, since underinflation raises rolling resistance and wear. Checking pressures regularly prevents the damage.

97. C — With the switch and fuse proven, the fault is in the wiring, connector, or heating element. Checking for supply voltage at the connector and measuring the element resistance finds which. The compressor discharge line, pushrod stroke, and coolant concentration have nothing to do with the mirror heater circuit. Meter checks separate wiring faults from a failed element.

98. D — Many sensors share one regulated five-volt reference from the control module. If it is shorted to ground or the module cannot supply it, every sensor on that reference shows low voltage together. Checking that supply and wiring is far quicker than testing each sensor. Pedal switches, cabin filters, and belt tension do not feed those sensors.

99. B — On slippery surfaces a retarder acting on the drive wheels can cause them to lock. When the ABS controller detects slip, it sends a message to disable the retarder so the brake modulation can recover the wheel. Increasing retarding force would make the lock worse. That coordination keeps steering control available on ice.

100. B — Jumping out of gear under load means the gear is not held fully in mesh, due to rounded engagement teeth, a weak detent spring or ball, or worn forks and rails. Inspection of those parts will find the fault. Dash air pressure, windshield condition, and lighting fuses are not related to gear retention.

101. C — At high rpm, bearings and cooling jets draw more oil, and a blocked pickup screen, worn pump, or aerated oil can no longer supply it. Normal idle pressure with a high-rpm drop is the classic result. A coolant leak or fan clutch would give other symptoms, and valve lash does not change oil demand much.

102. D — A multimeter averages and updates a few times per second, so very short dropouts are missed. A scope displays voltage against time with a fast sample rate, showing glitches, noise, and missing pulses. It does not measure resistance more accurately, supply power, or load the circuit. Intermittent faults are best caught by recording during a road test.

103. A — Oil-lubricated hubs have a marked level on the hubcap or a fill plug that sets the right quantity when the truck is level, which ensures the bearings are covered without churning. Overfilling to the vent leads to leaks, and checking colour alone or adding grease does not set the level.

104. C — Side-to-side play at the water pump shaft means the bearing is worn. It will soon let the seal fail, wobble the pulley, and damage the belt. Waiting for a leak risks an overheat. Sealants do not repair bearings, and increasing belt tension speeds up the failure. Replacement is cheaper than the damage a failure causes.

105. B — Defrost works by moving dry air over the glass. If the system is in recirculation or the compressor is not engaging to remove moisture, humid air stays in the cab and fogs the glass. Oil level, wheel nuts, and trailer air lines do not affect cabin humidity. Dry air is the key to clearing a windshield.

106. D — Oil soaks into the lining material, and cleaning or sanding cannot remove it from within. The linings must be replaced after the seal leak is fixed, or the new linings will be contaminated too. Burning oil off is unsafe and unreliable, and solvent can spread the oil deeper. A clean, sealed axle prevents repeat failures.

107. A — Chatter on engagement often comes from a warped or heat-checked flywheel, oil or grease on the friction surfaces, or poor alignment of the pressure plate and disc. Inspecting those items finds the cause. The air tank safety valve, plate lamp connectors, and rear lining thickness do not affect clutch engagement.

108. C — Power from the battery needs a fuse near the source to protect the wire, and a relay keeps heavy current off the switch and lets the circuit be controlled by a switched source. The wire must be sized for the load, so thinner wire is worse. A proper ground goes to the chassis, and removing the fuse leaves no protection.

109. A — A pintle hook carries the whole trailer pull, so wear on the horn or latch beyond limits, or any crack, reduces the safe load capacity and the hook must be replaced. Light surface rust, grease, and chipped paint do not weaken the hook and are normal. Inspecting it at every service finds wear early.

110. B — The marking 10.9 indicates a high-strength metric property class, and the pump bracket was designed around it. A replacement must match in class, diameter, pitch, and length. Lower-class bolts such as 8.8 or 4.8, or an inch Grade 5 bolt, can stretch or fail under the pump torque reaction. Strength class is stamped on the head.

111. D — If the supply line is lost, the trailer's emergency system must apply the spring brakes, which prevents a runaway trailer in a breakaway. The test confirms the relay emergency valve and spring brakes are working. Brakes that stay released, lights, and landing gear are not part of this system. It is a required safety test.

112. C — Viscosity index describes how little the viscosity changes with temperature, so a high index oil stays thin enough in the cold and thick enough when hot. Flash point and pour point describe other limits, and a high acid number indicates oxidized oil rather than a stable one. Choosing the right grade saves cold-start wear.

113. D — Nitrite-based inhibitors form a protective film that resists cavitation erosion on wet liners, so a low reading means the liners are at risk of pitting and possible coolant leaks into the crankcase. The tank level, fin heat transfer, and freezing are unrelated to nitrite level. Test strips show when more additive is needed.

114. B — Total loss of power with a healthy battery points to an open in the main feed, such as an open disconnect switch, loose main cable, or master relay. Checking it takes minutes. Air dryers, tire sensors, and turbo actuators do not supply power to the dash or starter. Start with the simplest, cheapest check.

115. A — A parking brake holding test should be done safely, with the park brakes applied and service brakes released, using low throttle in gear to see whether the spring brakes can hold the vehicle. Rocking by hand proves nothing for a loaded vehicle, and a slope test is unsafe. Applying the service brake tests a different system.

116. B — A once-per-revolution vibration that follows shaft speed is a first-order disturbance, typical of imbalance or a bent tube. Engine misfire and fan belt noise are tied to engine speed rather than driveshaft speed, and a worn steer axle wheel bearing is tied to wheel speed, not the shaft. Measuring the shaft speed confirms the frequency.

117. A — Toe is measured as the rear distance minus the front distance. Here the rear measurement is 6 mm larger than the front, so the wheels point slightly inward at the front, which is toe-in. Reversing the subtraction would give toe-out. Halving or doubling the difference produces 3 or 12 mm, which are not the measurements shown.

118. C — Even in electric trucks, contactors and control modules are powered by a 12 V battery, kept charged by a DC-DC converter. If it is weak, the system cannot close the high-voltage contactors, so the truck will not go ready. There is no starter, alternator belt, or turbocharger on a battery-electric truck.

119. D — Black smoke with half the boost means the engine lacks air. With the filter and piping clear, the turbocharger itself is the next suspect: a damaged wheel, worn bearings, or a variable-geometry actuator stuck open reduces boost. The dipstick, alternator, and brake chambers have nothing to do with intake air.

120. B — An overrunning alternator pulley allows the rotor to coast when engine speed drops, reducing belt noise and vibration. If it binds, slips, or sticks, noise and belt wear appear on deceleration. A starter relay, thermostat housing, and fuel return line do not influence alternator pulley behaviour. A worn clutch inside the pulley shows as rough rotation by hand.

121. A — An air seat holds its height by keeping air in a bladder and a valve that regulates it. If the seat sinks slowly while parked, air is escaping from the bladder, fittings, or valve. A transmission switch, steering gear, and alternator have no connection to the seat suspension. Soap solution can find the leak quickly.

122. D — A tone ring with missing teeth produces an irregular signal that looks like wheel speed changes, so ABS may set faults or cycle wrongly. Replacing the ring, setting the correct gap, and confirming a clean signal restores operation. Bending teeth, changing the gap, or disconnecting the controller leaves the defect or disables a safety system.

123. C — An electric retarder produces braking torque from magnetic fields created by current in its coils, so weak performance with healthy windings points to the supply side: voltage, grounds, relays, or controller outputs. The oil filter, fifth wheel plate, and door latch have nothing to do with retarder current. Measure voltage under load, not just at rest.

124. C — A notchy feel that repeats at particular positions suggests a worn or dry U-joint in the steering shaft, because the joint binds at a certain angle. Pump pressure is normal, so the hydraulics are fine. The

treadle valve, alternator regulator, and washer pump are unrelated to steering shaft movement. Checking the shaft joints takes only minutes.

125. B — A low-level fault with a visibly full system suggests the sensor or its circuit is the problem, such as a corroded connector, open wire, or failed probe. Checking it is cheap and logical. The water pump, flushing, and module replacement are expensive actions that are not supported by the evidence.

126. D — Fuel-fired heaters need a clear air intake and exhaust, a steady fuel supply, and stable voltage. A restriction or a drop in any of them causes flame-out and shutdown. The brake treadle valve, belt tension alone, and turbo waste gate are not part of the heater's operation. A clean combustion chamber is also needed.

127. A — Suppression diodes clamp the voltage spike when the coil collapses, and they conduct if the supply is reversed. A reversed test connection would short the supply or burn the diode, so the terminal marked positive must go to positive. Contacts do not depend on polarity for operation, and the diode does not boost voltage or store energy.

128. C — Joints and splines are purged of old grease and contamination by pumping in fresh grease until it shows at the seals or the spline vent, using NLGI Grade 2 chassis grease. One shot may leave dry needles. Bulging a cap risks seal damage, and oil runs out of the joint and cannot hold up under load.

129. A — Sliding the trailer tandem forward brings it closer to the centre of the load, so the trailer axles carry more of the cargo and the kingpin carries less, which reduces the tractor drive axle load. Sliding it back does the reverse. The load distribution does change with axle position. Pins must be locked afterwards.

130. D — Hose standards set burst pressure at about four times the working pressure, so 20 MPa multiplied by 4 gives 80 MPa. Dividing by 4 gives 5, which reverses the factor. Doubling gives 40 and adding 4 gives 24, neither of which applies. The ratio must be multiplied, not divided or added.

131. B — Air should not escape from the vent hole of the service side while the brakes are applied. Bubbles there mean the service diaphragm has failed and air is passing through to the vent, so the chamber should be replaced. A normal chamber stays dry at the vent hole, and lubricant or modulator issues are not indicated.

132. A — A yoke bore must hold the bearing cap with a precise fit. Once the bore is worn, the cap can move and the joint will fail quickly, so the yoke must be replaced. Peening, shims, and adhesives are temporary measures that do not restore the fit and can fail suddenly under torque.

133. B — Cupping appears when a tire repeatedly bounces on the road, which can be caused by worn dampers, imbalance, or looseness in the suspension and wheel end. Inspecting those parts finds the source. The air dryer, battery, and marker lamp do not affect how the tire contacts the road. Balancing and damper checks come first.

134. C — Air pockets after refilling cause hot spots, erratic temperature, and poor heater flow, and coolant level falls as the air burps out. Using the vent points and the correct fill procedure removes it. A

turbo seal leak affects oil, a weak battery does not stop a fan clutch from engaging, and crankcase overfill does not change coolant temperature.

135. D — Wire resistance rises with length and falls with larger cross-section. The same current through a longer, thinner wire gives a greater voltage drop and a hotter conductor, which can starve the motor and overheat the insulation. Length does not generate voltage or store charge, and the motor draws what the load needs, not more.