PRACTICE EXAM 16: ASE A3 SIMULATION (50 QUESTIONS)

50 Questions · 60-Minute Time Limit

1. Compared with a single-mass flywheel, a dual-mass flywheel is designed to:

A. Increase the engine's idle rpm to reduce stalling

B. Dampen drivetrain torsional vibration with internal springs

C. Eliminate the need for any clutch driven disc damper springs

D. Allow standard machining like a conventional flywheel face

2. A clutch pedal develops free play that has grown over time on a self-adjusting cable system. The MOST likely cause is:

A. A failed self-adjusting cable mechanism stuck in one position

B. Air trapped inside the hydraulic master cylinder bore area

C. A worn pilot bearing inside the engine crankshaft end bore

D. A leaking slave cylinder bypassing fluid past the internal seal

3. A driver complains of a high-pitched squeal that occurs only while the clutch pedal is held partially depressed at a stoplight. The MOST likely cause is:

A. A glazed clutch driven disc slipping under engine torque

B. A worn pilot bearing seized inside the crankshaft bore

C. A worn release (throw-out) bearing partially loaded on the diaphragm

D. A cracked flywheel ring gear contacting the starter pinion

4. Compared with a push-type clutch, a pull-type clutch:

A. Uses the release bearing to pull the diaphragm fingers outward

B. Eliminates the need for any pressure plate diaphragm spring at all

C. Requires no pilot bearing inside the engine crankshaft end

D. Always uses a cable rather than a hydraulic release system

5. All of the following are common causes of clutch slippage EXCEPT:

A. Oil or grease contamination soaked into the clutch facings

B. A weak or broken pressure plate diaphragm spring

C. Worn friction facings near the riveted wear limit value

D. A worn release bearing dragging on the diaphragm fingers

6. A manual transmission grinds going into reverse only, while forward gears engage smoothly. On a unit with non-synchronized reverse, the MOST likely cause is:

A. Worn synchronizers in every forward gear position at once

B. A clutch that is dragging and not fully releasing the input shaft

C. A low gear lubricant level overheating the reverse idler gear set

D. A worn output shaft bearing in the rear extension housing area

7. A transmission first-gear set uses a 14-tooth input gear driving a 42-tooth countershaft gear. The first-gear ratio is:

A. 1.5:1

B. 2.5:1

C. 3.0:1

D. 3.5:1

8. A whining noise from a manual transmission is present in third, fifth, and reverse, but is quiet in fourth (direct drive). The MOST likely cause is:

A. Worn synchronizer blocking rings on the upper shift hub

B. A worn input shaft pilot bearing seated in the crankshaft

C. A worn output shaft tailshaft bearing in the housing area

D. Worn countershaft cluster gear bearings loaded in the indirect gears

9. A transmission's third-fourth synchronizer sleeve does not slide freely on its hub during bench inspection. The correct action is to:

A. Replace the synchronizer assembly, since binding causes hard shifts

B. Lubricate it with chassis grease and reinstall as is

C. Polish the splines smooth with fine emery cloth and reuse

D. Heat the sleeve evenly and tap it free with a soft hammer

10. A growling noise in a manual transmission is present only when accelerating in any gear and disappears while coasting. The MOST likely cause is:

A. A worn output shaft tailshaft bearing supporting the rear shaft

B. A worn pilot bearing seated inside the crankshaft bore area

C. Worn drive-side gear teeth or worn input/cluster shaft bearings

D. A dragging release bearing under continuous clutch pedal pressure

11. Technician A says synchronizer cones must be free of brass particles and deep scoring. Technician B says polishing a scored cone with emery cloth restores its grip permanently. Who is correct?

A. Technician A only

B. Both Technician A and Technician B

C. Technician B only

D. Neither Technician A nor Technician B

12. A manual transmission specifies a synthetic 75W-90 GL-4 lubricant. Using a non-synthetic GL-5 lubricant instead can MOST likely cause:

A. Permanently improved synchronizer engagement in all gears

B. A lower fluid level reading at the fill plug opening

C. Damage to brass synchronizer parts from extreme-pressure additives

D. A measurable increase in the final drive gear ratio

13. A clutch master cylinder has fluid level that drops gradually with no external leak. The MOST likely cause is:

A. An internally leaking slave cylinder allowing the fluid to escape

B. A worn pilot bearing seizing inside the crankshaft bore area

C. A glazed clutch disc slipping under light acceleration loads

D. A worn release bearing dragging on the diaphragm fingers at idle

14. A manual transmission's output shaft end play is found to be excessive. The correct corrective action is to:

A. Tighten the extension housing bolts to a higher torque value

B. Select the proper thickness thrust washer or selective shim

C. Add a heavier viscosity gear lubricant to the gearbox case

D. Replace the synchronizer blocking rings on every shift hub

15. A manual transmission overheats during normal driving, even though the lubricant level is correct. The MOST likely cause is:

A. An overfilled case with too much lubricant churning to foam

B. A leaking output shaft seal at the rear extension housing area

C. A loose drain plug at the bottom of the main case body

D. Worn bearings or gears generating excess friction inside the case

16. A transmission jumps out of third gear under acceleration. Technician A says worn third-gear clutching teeth can cause this condition. Technician B says a worn or bent third-fourth shift fork can also cause it. Who is correct?

A. Neither Technician A nor Technician B

B. Technician A only

C. Both Technician A and Technician B

D. Technician B only

17. A clutch is being installed on a new flywheel. The disc must be centered using:

A. A clutch alignment tool through the disc and pilot bearing

B. The transmission input shaft trial-fitted before final torque

C. The hub nut on the crankshaft tightened to specification first

D. The clutch master cylinder pre-bled with the proper fluid only

18. A FWD outer CV boot is intact, but a clicking is heard during slow tight turns. The MOST likely cause is:

A. A worn inboard tripod plunge joint loading under acceleration

B. A loose front wheel bearing with excessive radial play

C. A worn lower control arm bushing flexing during turning

D. A worn outer CV joint with internal wear despite an intact boot

19. A FWD transaxle final drive uses a 15-tooth pinion driving a 57-tooth ring gear. The final drive ratio is closest to:

A. 3.50:1

B. 4.25:1

C. 3.80:1

D. 4.50:1

20. Compared with a fixed Rzeppa joint, a tripod (tripot) joint:

A. Cannot transmit any drive torque to the wheel

B. Allows the half shaft to change length during suspension travel

C. Is found only on the outer joint of the front half shaft assembly

D. Operates only at high steering angles, not straight-ahead driving

21. Before separating a FWD outer CV joint from the steering knuckle, the technician should:

A. Drain the transaxle fluid completely from the fill plug opening

B. Adjust the final drive backlash inside the transaxle housing

C. Set the differential pinion preload to factory specification

D. Loosen the axle hub nut while the wheel is on the ground

22. A whining noise from a FWD transaxle tracks road speed in both drive and coast, after tires check out. The MOST likely cause is:

A. A worn clutch release bearing under continuous load conditions

B. Worn final drive ring-and-pinion gears or their bearings in the case

C. A worn outer CV joint clicking only at full steering lock

D. A worn pilot bearing seated in the engine crankshaft end bore

23. A FWD transaxle leaks fluid at the right inner joint, and the case fluid is low. The MOST likely cause is:

A. The transaxle breather releasing fluid through the vent port

B. The outer CV boot slinging grease at highway road speeds

C. A loose drain plug not torqued to factory specification

D. The right axle (output) shaft seal at the differential side gear

24. A FWD vehicle's torque steer pulls under hard acceleration and self-centers off throttle. This is MOST influenced by:

A. A leaking pinion seal lowering the rear axle fluid level

B. A dragging front brake caliper on the opposite-side wheel hub

C. Unequal half-shaft lengths producing uneven drive torque effort

D. A worn outer CV joint clicking during cornering at low speed

25. A FWD half shaft is installed with its axle nut hand-tight only. The MOST likely result is:

A. A loose front wheel bearing with play, noise, and possible damage

B. Incorrect final drive backlash inside the transaxle housing

C. A torn outer CV boot from internal pressure buildup over time

D. A dragging front brake caliper on the same side of the vehicle

26. A FWD vehicle has a steady drone that rises with road speed and is unaffected by throttle or light braking. The MOST likely cause is:

A. A worn inboard plunge joint loading during acceleration only

B. A worn front wheel bearing producing a speed-related drone

C. A slipping clutch disc flaring under light throttle conditions

D. A warped brake rotor pulsing through the steering wheel area

27. When both FWD half shafts are removed during transaxle service, the differential side gears must be:

A. Filled with extra-pressure assembly lubricant from a tube

B. Torqued to a higher specification than original factory value

C. Held in correct alignment using a shipping plug or joint stub

D. Replaced with a new set whenever the shafts are removed once

28. A FWD transaxle drips fluid only overnight when cold and stops once driven and warm. The MOST likely cause is:

A. A worn axle or input shaft seal that seeps when fully cold

B. An overfilled case venting fluid through the breather port

C. A cracked CV joint housing leaking grease only at high speed

D. A loose drain plug that was not torqued to specification

29. A RWD vehicle has a vibration that begins around 40 mph and increases with road speed. After tires check out, the next item to inspect is the:

A. Clutch disc and pressure plate for slip-related vibration causes

B. Transmission second-gear synchronizer blocking ring assembly

C. Rear axle pinion seal for a lubricant leak at the front yoke

D. Driveshaft for runout, worn U-joints, and overall balance condition

30. A two-piece driveshaft uses a center support bearing. Compared with a one-piece design, the two-piece arrangement is MOST often used to:

A. Increase the rear axle gear ratio for stronger acceleration

B. Reduce vibration in longer driveshafts using a midpoint support

C. Eliminate the need for any universal joints in the driveline

D. Provide a mounting point for the parking brake cable system

31. A clunk is heard from the driveline of a RWD vehicle each time the throttle is opened and closed at low speed. After the U-joints check good, the next inspection is the:

A. Slip-yoke splines and rear axle backlash for excessive play

B. Clutch master cylinder pushrod free play setting and travel

C. Front wheel bearing preload on each side of the front axle

D. Transmission second-gear synchronizer for excessive wear damage

32. When installing a driveshaft on a RWD vehicle, the technician aligns the marks made before disassembly. This procedure is performed to:

A. Set the correct ring gear backlash inside the differential case

B. Establish the proper pinion bearing preload for the unit

C. Align the speedometer drive gear teeth before final assembly

D. Maintain the original driveshaft phasing and balance condition

33. A double-cardan (constant-velocity) joint at the driveshaft transmission end is MOST often used to:

A. Allow the slip yoke to change driveshaft length under load

B. Cancel speed fluctuation where the driveshaft works at a steep angle

C. Provide a mounting point for the rubber center support bearing

D. Increase the rear axle gear ratio for stronger acceleration in low gear

34. A rear axle howls under acceleration but quiets on coasting. The MOST likely cause is:

A. Incorrect ring-and-pinion drive-side tooth contact or wear damage

B. A worn pinion bearing growling at every throttle position

C. A bent axle shaft wobbling once per wheel revolution under load

D. A worn limited-slip clutch pack lacking friction modifier additive

35. During differential setup, gear marking compound shows the pinion contact riding too far toward the tooth face (toward the toe). The correct adjustment is to:

A. Increase ring gear backlash with the carrier side adjusters

B. Crush the collapsible spacer further to raise pinion preload

C. Move the pinion deeper into mesh with a thicker depth shim

D. Replace both carrier bearings with oversized service parts

36. A pinion seal is being replaced on a RWD axle that uses a crush sleeve. To preserve the original pinion bearing preload, the technician should:

A. Mark the nut and yoke and record the rotating torque first

B. Tighten the pinion nut beyond its previous mark to be safe

C. Add shims behind the inner pinion bearing race for backup

D. Apply thread-locking compound to all of the pinion thread sets

37. A limited-slip differential spins one wheel on ice exactly like an open differential would. After the gear oil and friction modifier are addressed, the MOST likely cause is:

A. Ring-and-pinion backlash set too tight at factory assembly

B. A worn pinion bearing growling at every road speed level

C. A bent axle shaft producing a once-per-turn vibration feel

D. Worn or glazed limited-slip clutch packs inside the carrier

38. A rear axle ratio is changed from 4.10:1 to 3.55:1. Compared with the original, the new ratio will MOST likely:

A. Raise engine rpm at cruise and improve low-speed acceleration

B. Lower engine rpm at cruise and reduce low-speed acceleration

C. Have no measurable change in either cruise rpm or acceleration

D. Lock the rear differential during straight-line driving on highways

39. A C-clip axle shaft can be pulled from the housing only after the technician:

A. Disconnects the parking brake cable from the rear backing plate

B. Presses the wheel bearing off the outer end of the axle shaft

C. Removes the differential cover and the pinion (cross) shaft

D. Crushes a new collapsible spacer to set the pinion preload value

40. Compared with a semi-floating axle, a full-floating axle:

A. Carries vehicle weight on the axle shaft and the wheel bearing

B. Uses one wheel bearing pressed onto the outer axle shaft end

C. Supports vehicle weight on the hub and spindle, not on the shaft

D. Is found only on the front axles of two-wheel-drive passenger cars

41. A rear axle leaks lubricant at the pinion yoke on a RWD vehicle. The MOST likely cause is:

A. A worn pinion seal allowing lubricant to escape at the yoke area

B. A worn axle shaft seal at one of the outer wheel ends of the housing

C. A loose differential cover with a failed paper gasket joint area

D. An overfilled axle venting fluid through the housing breather only

42. An open differential delivers driving torque such that:

A. The wheels always rotate together at one identical fixed speed

B. All available torque is sent to the wheel with the most road grip

C. Both wheels receive equal torque while allowing different speeds

D. The wheels lock together whenever the vehicle starts to slip on ice

43. A rear axle's gear lubricant is found to be milky white during inspection. The MOST likely cause is:

A. Normal high-mileage condition for a properly serviced axle unit

B. Water contamination entering through a submerged or clogged vent

C. Correct additive content for a limited-slip differential application

D. Heavy loading overheating the lubricant and breaking the additives

44. During ring-and-pinion setup, backlash measures too loose at 0.015 in versus a 0.006–0.010 in spec. The correct adjustment is to:

A. Move the ring gear toward the pinion with the carrier side adjusters

B. Add a thicker shim behind the inner pinion bearing race

C. Crush the collapsible spacer further to raise the bearing preload

D. Replace both axle shafts and their wheel bearings together as a set

45. A part-time 4WD truck is being driven on dry pavement in four-wheel drive. Compared with normal two-wheel-drive operation, the vehicle will MOST likely experience:

A. Improved fuel economy from sharing the torque across both axles

B. Increased steering response with no additional driveline stress

C. Reduced engine load and a lower operating temperature in 4WD

D. Driveline windup and tire scrub on tight turns from a locked driveline

46. A viscous coupling in some AWD systems transfers torque by:

A. Engaging a multi-plate clutch with hydraulic line pressure only

B. Using an electric solenoid to lock the center differential carrier

C. Shearing a silicone fluid between sets of interleaved internal plates

D. Meshing helical gears between the front and rear output shafts

47. A 4WD vehicle has a humming noise that rises with road speed and is unaffected by turning the steering. After tires are ruled out, the MOST likely cause is:

A. A worn driveline bearing such as a wheel or carrier bearing

B. A slipping clutch disc under light acceleration loads only

C. A misadjusted clutch release linkage holding bearing pressure

D. A dragging front brake caliper rubbing the rotor face surface

48. Manual locking front hubs on an older part-time 4WD truck are used to:

A. Lock the rear differential during straight-line traction on dirt

B. Disengage the rear driveshaft for normal highway cruising at speed

C. Provide added gear reduction for low-speed transfer case pulling

D. Connect the front wheels to the half shafts only when the driver engages them

49. A 4WD vehicle will not engage four-wheel drive, but the transfer case shift motor is heard operating normally. The next item to check is the:

A. Rear differential lubricant level and overall fluid condition

B. Front axle disconnect actuator and its engagement feedback

C. Clutch pedal position switch and its adjustment setting only

D. Speedometer output sensor on the transmission tailshaft housing

50. Before condemning a 4WD transfer case for a noise complaint, the technician should FIRST:

A. Replace the transfer case shift motor and the control module unit

B. Adjust the front axle disconnect actuator to its neutral stop point

C. Verify the fluid level, condition, and matched tire sizes on the vehicle

D. Set the rear differential ring gear backlash to factory specification

PRACTICE EXAM 16: ANSWER KEY AND EXPLANATIONS

1. B — A dual-mass flywheel uses internal springs between its two masses to dampen drivetrain torsional vibration. The springs absorb the engine pulses before they reach the transmission. This smooths idle and shifts compared with a single-mass design.

2. A — Growing free play on a self-adjusting cable clutch indicates the self-adjusting mechanism has failed and is no longer taking up cable slack as the disc wears. The lost adjustment lets the pedal travel increase over time. Repair requires replacing the cable assembly or its adjuster.

3. C — A high-pitched squeal only while the pedal is partially depressed comes from a worn release bearing partially loaded against the diaphragm fingers. The dry or worn bearing squeals as it spins under light load. A fully released or fully engaged position would not produce this specific symptom.

4. A — In a pull-type clutch, the release bearing pulls the diaphragm fingers outward to disengage, while a push-type pushes them inward. This reversed actuation distinguishes the two designs. Both styles still use a pressure plate, pilot bearing, and either cable or hydraulic release.

5. D — A worn release bearing causes noise and possibly incomplete release, not slippage, so it is the exception. Slippage comes from reduced clamping force or contaminated friction surfaces, such as oil, a weak diaphragm, or worn facings. The release bearing does not affect clamp load.

6. B — Grinding into a non-synchronized reverse while forward gears engage cleanly points to a dragging clutch that is not fully releasing the input shaft. The synchronized forward gears mask the drag, but reverse has none. Verifying full clutch release is the first step.

7. C — Gear ratio is driven teeth divided by drive teeth, so 42 ÷ 14 equals 3.0:1. The output turns one third as fast as the input in first gear. This reduction multiplies engine torque for launching.

8. D — Noise in the indirect gears that quiets in direct drive identifies worn countershaft cluster bearings, which carry load in every gear except direct. In fourth (direct) the countershaft is unloaded. The load pattern isolates the cluster bearings.

9. A — A synchronizer sleeve that does not slide freely on its hub indicates wear or damage that causes hard shifting, so the assembly must be replaced. Lubrication, polishing, or heating cannot restore correct fit. Replacement ensures smooth engagement.

10. C — A growl only on acceleration that disappears on coast indicates wear on the drive-side gear teeth or the input/cluster shaft bearings under load. Mesh noise changes with load direction, unlike a constant bearing growl. The acceleration-only character isolates loaded components.

11. A — Technician A is right that synchronizer cones must be free of brass particles and deep scoring to function. Polishing a scored cone with emery cloth does not permanently restore grip, so Technician B is wrong. Damaged cones require replacement.

12. C — A GL-5 lubricant carries aggressive extreme-pressure additives that can chemically attack brass and bronze synchronizer parts where GL-4 is specified. The added sulfur-phosphorus compounds corrode soft yellow metals. Always use the rated lubricant for the unit.

13. A — Master cylinder fluid that drops gradually with no external leak indicates an internally leaking slave cylinder bypassing fluid past a worn seal. The fluid escapes inside the bell housing or back into the system without visible signs. Replacing the slave cylinder cures it.

14. B — Excessive output shaft end play is corrected by selecting the proper thickness thrust washer or selective shim to bring it within specification. Bolt torque, lubricant viscosity, and synchronizer parts do not change shaft end play. The correct shim restores the specified clearance.

15. D — A transmission that overheats during normal driving with the lubricant level correct usually has worn bearings or gears generating excess friction. The wear converts driving energy into heat inside the case. An internal teardown reveals the worn components.

16. C — Both technicians are right: worn third-gear clutching teeth let the gear walk out under acceleration, and a worn or bent third-fourth shift fork fails to hold the sleeve fully engaged. Either condition produces jumpout. Both items should be inspected.

17. A — A clutch disc is centered using a clutch alignment tool that passes through the disc and pilot bearing. Centering allows the transmission input shaft to slide through the splines during installation. Without it, the input shaft cannot enter the pilot bearing.

18. D — A clicking on slow tight turns with an intact boot indicates a worn outer CV joint with internal wear despite the boot remaining sealed. The joint can wear from age or contamination that occurred before inspection. Replacement of the joint or half shaft is required.

19. C — Final drive ratio is ring teeth divided by pinion teeth, so 57 ÷ 15 equals 3.8:1. The pinion turns 3.8 times for each ring gear revolution. This is the closest listed ratio.

20. B — A tripod (tripot) joint allows the half shaft to change length during suspension travel, since its rollers slide axially within the housing tracks. The fixed Rzeppa joint does not plunge. This is why the tripod is typically used as the inboard joint.

21. D — The axle hub nut is loosened while the wheel is on the ground so the vehicle weight keeps the hub from spinning during the break-loose. With the wheel lifted, the hub would rotate as the technician applied torque. Ground contact provides the needed resistance.

22. B — A whine that tracks road speed in both drive and coast comes from worn final drive ring-and-pinion gears or their bearings. Those parts turn with vehicle speed, unlike clutch or pilot bearing faults. The speed-linked whine isolates the final drive.

23. D — A leak at the right inner joint with low transaxle fluid traces to the right axle (output) shaft seal at the differential side gear. The breather and outer boot do not release gear oil there. Replacing the seal stops the loss.

24. C — Torque steer that pulls under acceleration and self-centers off throttle is driven by unequal half-shaft lengths and the resulting drive angle differences. The shafts twist unequally, producing uneven tractive effort. Equalizing length reduces the pull.

25. A — A hub nut left only hand-tight leaves the wheel bearing under-clamped, producing play, noise, and possible damage. The bearing depends on full preload from a properly torqued nut. Final torque to specification is essential.

26. B — A steady drone that rises with road speed and ignores throttle and light braking is a worn front wheel bearing. Bearing noise is speed-dependent and load-tolerant, unlike brake or driveline faults. Replacing the bearing removes the drone.

27. C — A shipping plug or old joint stub holds the differential side gears in correct alignment when both half shafts are out. Without it, a side gear can rotate or drop and prevent the opposite shaft from reseating. The holder preserves correct gear position.

28. A — A seep that appears overnight when cold and stops once warm indicates a worn axle or input shaft seal whose lip conforms better at operating temperature. An overfill or boot leak shows up while driving, not parked. The temperature pattern points to the seal.

29. D — A vibration that begins near 40 mph and grows with speed, after tires check out, points next to the driveshaft for runout, worn U-joints, and balance. Driveshaft faults are speed-dependent and load-independent. Clutch and synchronizer items do not fit.

30. B — A two-piece driveshaft with a center support is used most often to reduce vibration in longer driveshafts by supporting the shaft at its midpoint. The midpoint support raises the critical speed and steadies the assembly. It still uses U-joints and is unrelated to ratio or parking brake.

31. A — A clunk each time the throttle is opened and closed at low speed, with good U-joints, points to slip-yoke spline play and rear axle backlash taking up lash on torque reversal. The free play slams as load direction changes. Inspecting these clearances locates the source.

32. D — Aligning the marks made before disassembly maintains the original driveshaft phasing and balance condition. Reinstalling rotated introduces a speed-related vibration. The marks restore factory alignment.

33. B — A double-cardan joint at the transmission end of a driveshaft cancels the speed fluctuation of a single U-joint where the shaft works at a steep angle. The paired joints keep output velocity constant. This reduces vibration in steep-angle layouts.

34. A — A howl under acceleration that quiets on coast indicates incorrect drive-side ring-and-pinion tooth contact or wear. Gear mesh noise changes with load direction, unlike a constant bearing growl. The drive-side pattern needs correction.

35. C — A pinion contact riding toward the tooth face (toe) means the pinion sits too far out and must move deeper with a thicker depth shim. Repositioning the pinion centers the pattern. Backlash and preload adjustments do not fix depth.

36. A — To preserve original preload during a pinion seal job with a crush sleeve, the technician marks the nut and yoke and records the rotating torque first. The marks reference the existing crush so the same position can be restored. This avoids crushing a new sleeve and resetting the entire setup.

37. D — A limited-slip unit that behaves like an open differential, after correcting the gear oil and friction modifier, has worn or glazed clutch packs inside the carrier. The friction surfaces have lost their grip. Rebuilding the clutch pack restores the limited-slip action.

38. B — Moving from 4.10:1 to 3.55:1 lowers the numerical ratio, so engine rpm at cruise drops and low-speed acceleration is reduced. Less torque multiplication trades launch for highway efficiency. The engine spins slower at any given road speed.

39. C — A C-clip axle shaft can be pulled only after the differential cover and the pinion (cross) shaft are removed so the C-clips can be released from the side gears. The clips are captive until the pinion shaft is out. This sequence is required for shaft removal.

40. C — A full-floating axle supports the vehicle weight on the hub and spindle, with the shaft carrying only torque. This separation lets a broken shaft be removed without the wheel falling off. It is why heavy trucks use this design.

41. A — Lubricant leaking at the pinion yoke comes from a worn pinion seal. The seal rides on the yoke or companion flange at the front of the housing. Replacing the seal stops the leak.

42. C — An open differential always splits torque equally to both wheels while permitting them to rotate at different speeds, which is what enables cornering. It cannot send extra torque to a higher-traction wheel. Equal torque, unequal speed defines the open design.

43. B — Milky white gear oil indicates water contamination, often entering through a submerged or clogged axle vent. The emulsified mixture is the telltale sign. Clearing the vent and flushing the housing addresses it.

44. A — Backlash that is too loose is corrected by moving the ring gear toward the pinion with the carrier side adjusters. Reducing the clearance brings backlash into spec. Pinion shims and spacers control depth and preload, not backlash.

45. D — Driving a part-time 4WD on dry pavement in four-wheel drive locks the front and rear together and produces driveline windup and tire scrub on tight turns. The locked axles cannot accommodate the turning speed differences. This stresses the driveline and tires.

46. C — A viscous coupling transfers torque by shearing a silicone fluid between sets of interleaved internal plates as a speed difference develops. The fluid thickens under shear and couples the outputs. No mechanical clutch or electronic control is involved.

47. A — A hum that rises with road speed and ignores steering input, with tires ruled out, points to a worn driveline bearing such as a wheel or carrier bearing. Bearing noise is constant and speed-related, unlike clutch or brake faults. Locating the worn bearing resolves it.

48. D — Manual locking front hubs connect the front wheels to the half shafts only when the driver engages them. Releasing them lets the front axle components stop turning during two-wheel-drive operation. This reduces wear and drag.

49. B — When 4WD will not engage but the shift motor runs, the next check is the front axle disconnect actuator and its engagement feedback. If the front axle never couples, the system cannot confirm four-wheel drive. Verifying the actuator isolates the fault.

50. C — Before condemning a transfer case for noise, the technician first verifies fluid level, condition, and matched tire sizes. These common, easily corrected causes are ruled out first. Replacing parts before this basic check wastes effort.