PRACTICE EXAM 7: ASE A3 SIMULATION (50 QUESTIONS)

50 Questions · 60-Minute Time Limit

1. A clutch engages abruptly and grabs even with smooth pedal release, making the vehicle lurch from a stop. The MOST likely cause is:

A. Excessive free play in the clutch release linkage

B. A worn release bearing dragging on the input shaft

C. Air trapped inside the clutch hydraulic release line

D. Oil-contaminated friction facings or worn cushion springs

2. A flywheel ring gear has several broken and worn teeth at one spot, causing an intermittent no-crank. The correct repair is to:

A. File the damaged teeth smooth and reuse the flywheel

B. Replace the ring gear or the flywheel assembly as required

C. Adjust the starter pinion clearance to skip the bad teeth

D. Install a thicker pilot bearing to reposition the flywheel

3. A clutch pedal feels spongy and the clutch fails to fully disengage on a hydraulic system, yet there are no external fluid leaks. The MOST likely cause is:

A. A stretched clutch cable out of its normal adjustment range

B. A worn pilot bearing binding the transmission input shaft

C. A failing master or slave cylinder leaking internally past its seal

D. A warped flywheel causing uneven clutch disc engagement

4. During clutch replacement, the technician notices the new disc hub protrudes more on one side. The disc must be installed so the:

A. Marked or raised hub side faces the correct component as specified

B. Springs always point toward the engine flywheel surface

C. Friction facings ride directly against the bare crankshaft

D. Hub splines engage the pilot bearing instead of the input shaft

5. A pull-type clutch differs from a push-type clutch in the way the:

A. Driven disc is riveted to the engine flywheel surface

B. Pilot bearing supports the rear of the output shaft

C. Pressure plate bolts directly onto the transmission case

D. Release bearing acts on the diaphragm fingers to disengage

6. A manual transmission grinds going into second during quick upshifts but shifts cleanly when shifted slowly. The MOST likely cause is:

A. A bent shift fork restricting full collar travel into gear

B. Low gear lubricant level overheating the second-gear set

C. A worn second-gear synchronizer unable to match speed quickly

D. A clutch that drags only during rapid pedal application

7. A transmission output shaft turns a speedometer drive gear of 8 teeth meshed to a driven gear of 24 teeth. The driven gear turns at what fraction of the drive gear's speed?

A. Twice the speed of the drive gear

B. One third the speed of the drive gear

C. The same speed as the drive gear

D. Three times the speed of the drive gear

8. A growling noise is present in first through third gears, reduces in fourth (direct), and returns in fifth (overdrive). The MOST likely source is:

A. Worn countershaft (cluster) bearings loaded in the indirect gears

B. A worn output shaft rear bearing loaded only in direct drive

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

D. Worn synchronizer blocker rings on the fifth-gear hub only

9. Before disassembling a manual transmission on the bench, the technician should shift it through all gears to:

A. Drain the remaining lubricant from each gear pocket

B. Reset the synchronizer rings to their neutral positions

C. Equalize the bearing preload across the input and output

D. Confirm the shift pattern and note any binding or noise

10. A cable-operated clutch will not disengage, the transmission grinds going into first, and the free play is excessive. The FIRST correction is to:

A. Replace the clutch disc and pressure plate as a matched set

B. Bleed the clutch hydraulic system to remove trapped air

C. Adjust the clutch cable to set the proper free play

D. Replace the worn pilot bearing in the crankshaft bore

11. A transmission jumps out of fifth (overdrive) on deceleration only. Technician A says worn overdrive clutching teeth can cause this. Technician B says worn powertrain mounts can cause it by allowing the unit to shift. 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 is noisy in neutral with the engine idling and the clutch engaged, but the noise stops in every gear once moving. The MOST likely cause is:

A. A worn output shaft bearing loaded only while driving

B. A worn input shaft bearing or constant-mesh gear noise

C. A dragging clutch release bearing under pedal pressure

D. Worn synchronizers in each of the forward gear positions

13. A clutch chatter complaint is being diagnosed. Which inspection is LEAST likely to reveal the cause?

A. Measuring the transmission gear oil level and viscosity

B. Checking the engine and transmission mounts for wear

C. Inspecting the friction disc for oil or grease contamination

D. Checking the flywheel and pressure plate for warpage

14. The purpose of the pilot bearing or bushing in a manual-transmission vehicle is to:

A. Set the release bearing-to-diaphragm running clearance

B. Carry the vehicle weight transferred through the driveline

C. Provide the mounting surface for the engine rear main seal

D. Support and center the input shaft nose in the crankshaft

15. A transmission lubricant analysis shows brass-colored particles suspended in the oil. This MOST likely indicates wear of the:

A. Steel countershaft bearing rollers and races

B. Cast-iron transmission case and bearing bores

C. Brass or bronze synchronizer blocker rings

D. Hardened steel input and output shaft splines

16. A hydraulic clutch uses a concentric (CSC) release bearing. A common failure of this design is:

A. An internal fluid leak, since it also serves as the slave cylinder

B. A stretched actuating cable losing its self-adjustment

C. A seized over-center spring holding the pedal down

D. A cracked bell housing from over-torquing the bolts

17. A manual transmission seeps lubricant from the top-mounted shift cover, and the vent is clear and unobstructed. The MOST likely cause is:

A. A worn output shaft seal at the rear extension housing

B. An overfilled case forcing oil out the breather opening

C. A failed or pinched shift cover gasket allowing seepage

D. A cracked bell housing letting clutch-side oil migrate

18. A FWD vehicle pulls to one side under hard acceleration and straightens when the throttle is released. This torque steer is MOST influenced by:

A. A worn outer CV joint on the longer half-shaft side

B. Unequal half-shaft lengths and drive angle differences

C. A leaking transaxle seal lowering the differential fluid

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

19. A FWD half shaft is being reinstalled. The technician torques the hub nut to specification primarily to:

A. Set the final drive backlash inside the transaxle case

B. Adjust the outer CV joint internal operating clearance

C. Center the disc brake rotor against the wheel hub face

D. Correctly preload the wheel bearing and seat the joint

20. A FWD transaxle final drive has a 19-tooth pinion driving a 76-tooth ring gear. The final drive ratio is:

A. 4.00:1

B. 3.50:1

C. 3.00:1

D. 4.50:1

21. A clicking from the right front of a FWD car occurs during tight left turns under light acceleration and is absent driving straight. The MOST likely cause is:

A. A worn inboard tripod joint plunging under acceleration

B. A loose right front wheel bearing with excessive play

C. A worn right-side outer CV joint articulating at full lock

D. A worn lower control arm bushing flexing during turns

22. A FWD transaxle whines under acceleration and the pitch follows road speed, not engine speed. After ruling out tires, the MOST likely cause is:

A. A worn clutch disc slipping under acceleration loads

B. Worn final drive (ring and pinion) gears in the transaxle

C. A worn input shaft pilot bearing in the engine crankshaft

D. A dragging brake pad creating friction at the rotor face

23. Both front half shafts are removed during service. To keep the differential side gears from becoming misaligned, the technician should:

A. Drain all of the transaxle fluid before pulling the shafts

B. Rotate the differential one full turn after each shaft is out

C. Torque the hub nuts to spec before removing either shaft

D. Insert a shipping plug or old joint stub to hold the gears

24. A FWD car shudders and vibrates only during hard acceleration from low speed, with no clicking on turns. The MOST likely cause is:

A. A worn or binding inboard tripod (plunge) CV joint

B. A worn outer CV joint nearest to the wheel hub

C. A slipping clutch disc flaring under acceleration

D. A worn front wheel bearing humming under load

25. Technician A says a transaxle integrates the transmission and differential into one unit. Technician B says a transaxle always requires a separate driveshaft to the rear axle. Who is correct?

A. Technician A only

B. Technician B only

C. Both Technician A and Technician B

D. Neither Technician A nor Technician B

26. A FWD transaxle's outer CV boot is cracked and slinging grease, but the joint is still quiet. The recommended service is to:

A. Add grease and reseal the existing boot with a clamp

B. Monitor it and replace only after clicking develops

C. Replace the boot and repack, or replace the joint or shaft

D. Replace the wheel bearing and hub on that corner

27. A whirring or grinding from a FWD transaxle that is present in neutral with the engine running and clutch engaged points to:

A. A worn outer CV joint on one of the front half shafts

B. A worn input shaft bearing or input-side gear in the case

C. A dragging brake caliper on the left front wheel position

D. A worn wheel bearing carrying the vehicle's cornering load

28. A FWD vehicle has a steady droning noise that rises with speed and is unaffected by light braking or throttle changes. The MOST likely cause is:

A. A worn inboard plunge joint loading during acceleration

B. A slipping clutch disc under light throttle conditions

C. A warped brake rotor pulsing through the wheel hub

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

29. A FWD transaxle is low on fluid and a stain is found at the right inner CV joint area. The MOST likely source of the leak is:

A. The transaxle vent or breather releasing excess fluid

B. The outer CV boot throwing grease at highway speed

C. The right axle (output) shaft seal at the differential

D. The final drive ring gear cracked and weeping fluid

30. A RWD vehicle has a vibration that begins around 45 mph and increases with speed, unaffected by engine load. A worn component that commonly causes this is the:

A. Driveshaft universal joint with worn needle bearings

B. Clutch driven disc slipping under light throttle loads

C. Transmission second-gear synchronizer blocking ring

D. Differential side gear worn in the carrier assembly

31. A clunk is heard from the driveline when a RWD vehicle is shifted from neutral into drive. After checking the U-joints, the next item to inspect is the:

A. Clutch master cylinder pushrod free play adjustment

B. Slip-yoke splines and differential pinion-to-side gear lash

C. Front wheel bearing preload on both sides of the axle

D. Transmission mount torque and shift linkage adjustment

32. A driveshaft is being balanced after a U-joint replacement. Repeated assembly in the wrong phase will cause:

A. A clicking that occurs only during low-speed cornering

B. A whine that varies directly with engine idle speed

C. A grinding felt through the clutch pedal at engagement

D. A speed-related vibration from a driveline out of balance

33. On a RWD vehicle, the slip yoke at the front of the driveshaft allows the:

A. Pinion gear to change its mesh depth under load

B. Rear axle to steer slightly during hard cornering

C. Driveshaft length to change as the suspension moves

D. U-joint angle to remain fixed at all suspension heights

34. A RWD axle makes a steady humming noise that does not change whether driving, coasting, or turning. The MOST likely cause is:

A. A worn pinion or carrier bearing in the axle housing

B. Incorrect ring-and-pinion drive-side tooth contact

C. A worn limited-slip clutch pack lacking friction modifier

D. A bent axle shaft producing a once-per-revolution wobble

35. A pinion seal is leaking on a RWD axle that uses a crush sleeve. When replacing the seal, the technician must be careful NOT to:

A. Mark the pinion nut and yoke before disassembly

B. Over-tighten the pinion nut and crush the sleeve further

C. Note the rotating torque before loosening the nut

D. Inspect the yoke sealing surface for grooves or wear

36. A limited-slip differential chatters during slow turns. After the gear oil and friction modifier are addressed and the noise remains, the next likely cause is:

A. Incorrect ring-and-pinion backlash set too loose at assembly

B. Worn limited-slip clutch plates or discs inside the carrier

C. A worn pinion bearing growling regardless of vehicle speed

D. A bent axle shaft creating a once-per-turn vibration feel

37. An axle ratio is changed from 3.08:1 to 4.10:1. Compared with the original, the new ratio will:

A. Raise top speed and reduce engine rpm at cruise

B. Have no effect on acceleration or engine cruise rpm

C. Lower the engine rpm noticeably at any given road speed

D. Improve low-speed acceleration and raise cruise rpm

38. A C-clip axle shaft has been removed for a bearing replacement. The wheel bearing on this design typically rides:

A. On a separate spindle bolted to the backing plate

B. Inside a pressed-on retainer ring at the shaft's outer end

C. Directly on the axle shaft surface or in the housing bore

D. On the differential side gear hub inside the carrier

39. A drive axle inspection finds the gear oil dark, thin, and smelling burnt. This MOST likely indicates:

A. Overheating from heavy loading or a low lubricant level

B. Normal lubricant condition for a high-mileage vehicle

C. Water contamination turning the lubricant milky white

D. Correct friction modifier content for a limited-slip unit

40. During ring-and-pinion setup, backlash measures too tight at 0.003 in versus a 0.008–0.010 in spec. The correct adjustment is to:

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

B. Crush the collapsible spacer further to raise the preload

C. Replace both axle shafts and their retaining C-clips

D. Move the ring gear away from the pinion with the adjusters

41. A rear axle housing leaks lubricant at the cover. After confirming the fluid level is correct, the MOST likely cause is:

A. A worn pinion seal leaking from the front yoke area

B. A failed cover gasket or sealant and loose cover bolts

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

D. A clogged axle vent forcing oil past the pinion seal

42. A vehicle with a selectable locking differential has the locker engaged on dry pavement during a tight turn. The driver will MOST likely notice:

A. Reduced steering effort and smoother cornering response

B. A pinion seal leak developing at the front of the axle

C. Tire scrub and driveline binding because both wheels lock

D. Improved fuel economy from reduced differential losses

43. A semi-floating rear axle shaft fractures at the wheel flange. A safety concern with this design is that the:

A. Wheel can separate from the vehicle because the shaft carries weight

B. Differential gears will lock and prevent the vehicle from rolling

C. Pinion seal will fail and drain the lubricant within seconds

D. Driveshaft will disconnect and drop onto the road surface

44. The drive pinion depth in a differential is set correctly by:

A. Adjusting the carrier side bearing adjuster nuts evenly

B. Crushing the collapsible spacer to the rotating-torque spec

C. Measuring backlash between the ring gear and pinion teeth

D. Selecting the proper shim and reading the contact pattern

45. A "positraction"-type limited-slip differential improves traction by:

A. Allowing both wheels to spin at completely independent speeds

B. Using clutch packs to send torque to the higher-traction wheel

C. Eliminating the spider gears found in an open differential

D. Locking the axle shafts together by hydraulic pressure only

46. A part-time 4WD truck is hard to shift out of four-wheel drive after running on dry pavement. The MOST likely cause is:

A. Driveline windup binding the transfer case until tension releases

B. Low transfer case fluid causing the shift fork to seize fully

C. A failed front axle disconnect motor stuck in the engaged stop

D. A worn transfer case chain skipping over the drive sprocket

47. An AWD vehicle uses a viscous coupling. As a speed difference develops between the front and rear, the coupling:

A. Releases all torque to protect the driveline components

B. Mechanically locks the two outputs with a dog clutch

C. Thickens its silicone fluid and transfers more torque

D. Sends power only to the axle with the least traction

48. A 4WD vehicle has a vibration and growl that increase with speed and remain when coasting in a straight line. After tires are ruled out, the MOST likely cause is:

A. A slipping clutch disc under light acceleration loads

B. A misadjusted clutch release linkage holding pressure

C. A dragging front brake caliper on one side only

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

49. On a 4WD system with automatic locking hubs, the hubs engage the front wheels to the axle shafts when:

A. The rear differential is locked for straight-line traction

B. The clutch pedal is depressed during a gear change

C. The transfer case is shifted into four-wheel drive and torque applies

D. The vehicle exceeds a preset highway cruising speed

50. Before diagnosing a transfer case shift complaint on an electronic-shift system, the technician should FIRST:

A. Replace the transfer case shift encoder motor assembly

B. Verify fluid level, battery voltage, and check for stored codes

C. Adjust the front axle disconnect actuator to its neutral stop

D. Set the rear differential ring gear backlash to specification

PRACTICE EXAM 7: ANSWER KEY AND EXPLANATIONS

1. D — Abrupt grabbing comes from oil-contaminated friction facings or worn cushion (marcel) springs in the disc that should ease engagement. Contamination glazes the facings and the flattened cushion springs remove the progressive take-up. The result is a sudden bite that lurches the vehicle.

2. B — A ring gear with broken teeth is repaired by replacing the ring gear or the entire flywheel assembly, depending on how it is attached. Filing teeth or adjusting the starter does not restore reliable cranking engagement. Proper tooth contact requires sound gear teeth.

3. C — A spongy pedal with no external leak that still fails to disengage indicates a master or slave cylinder leaking internally past its seal. Fluid bypasses the seal instead of moving the release components. Replacing the failed cylinder restores full clutch travel.

4. A — Many driven discs have an offset or marked hub that must face the specified component, usually noted "flywheel side." Installing it reversed can cause interference or incomplete engagement. Observing the marking ensures correct seating.

5. D — In a pull-type clutch the release bearing pulls the diaphragm fingers outward to disengage, whereas a push-type pushes them inward. This reversed actuation distinguishes the two designs. Knowing the type guides correct service and bearing setup.

6. C — Grinding only during quick upshifts, with clean slow shifts, points to a worn synchronizer that cannot match gear and shaft speed fast enough. Slow shifting gives the worn synchronizer time to equalize speeds. The second-gear synchronizer is the weak link.

7. B — The driven gear turns at the drive teeth divided by the driven teeth, so 8 ÷ 24 equals one third the drive gear's speed. The larger driven gear rotates slower than the smaller drive gear. This speed reduction sets the meter or output relationship.

8. A — Noise in the indirect gears that fades in direct drive identifies worn countershaft bearings, which are loaded in every gear except direct. In fourth (direct) the countershaft is unloaded, so the noise drops; overdrive reloads it. This load pattern isolates the cluster bearings.

9. D — Shifting through all gears before teardown confirms the shift pattern and reveals any binding or noise while the unit is still assembled. This baseline guides what to inspect during disassembly. Skipping it can hide an intermittent fault.

10. C — With a cable clutch and excessive free play, the first correction is to adjust the cable to restore proper free play so the clutch can fully disengage. There is no hydraulic system to bleed on this design. Correct adjustment often cures the grinding without parts.

11. B — Both technicians are right: worn overdrive clutching teeth let the gear walk out under deceleration, and worn powertrain mounts allow the unit to shift enough to disengage. Each can produce jumpout from fifth on coast. Inspecting both the gear and the mounts is warranted.

12. B — Noise in neutral at idle with the clutch engaged comes from the input shaft bearing or constant-mesh gears, which turn whenever the engine drives the input. In gear and moving, the load and speeds change and the noise shifts. The output bearing would be silent in neutral, ruling it out.

13. A — Measuring transmission gear oil level and viscosity is least likely to reveal a clutch chatter cause, since the clutch is a dry component unrelated to that fluid. Chatter traces to mounts, disc contamination, or flywheel and pressure plate warpage. Those inspections target the real sources.

14. D — The pilot bearing supports and centers the nose of the input shaft inside the crankshaft, letting it spin independently when the clutch releases. This keeps the input shaft from wobbling. A worn pilot bearing causes noise and hard shifting.

15. C — Brass-colored particles in the lubricant indicate wear of the brass or bronze synchronizer blocker rings, the softest metal in the gearbox. Steel parts would shed gray ferrous material instead. The brass color points to the synchronizers.

16. A — A concentric slave cylinder release bearing serves as both the bearing and the slave cylinder, so an internal fluid leak is a common failure. The leak causes loss of clutch release and requires transmission removal to replace. This integration is the design's weak point.

17. C — A seep from the top-mounted shift cover with a clear vent points to a failed or pinched cover gasket allowing leakage. With the vent open, pressure buildup is not the cause. Replacing the gasket stops the seep.

18. B — Torque steer that pulls under acceleration and clears off-throttle is driven mainly by unequal half-shaft lengths and the resulting drive angle differences. The shafts twist unequally and apply uneven tractive effort. Equalizing the design reduces the pull.

19. D — The hub nut is torqued to specification to correctly preload the wheel bearing and seat the joint into the hub. Under- or over-torque damages the bearing and shortens its life. Proper torque protects the assembly.

20. A — Final drive ratio is ring teeth divided by pinion teeth, so 76 ÷ 19 equals 4.00:1. The pinion turns four times for each ring gear revolution. This sets the transaxle's overall reduction.

21. C — A click during tight turns at full steering lock, absent when straight, is the signature of a worn outer CV joint. The outer joint must transmit torque through large articulation angles, where worn balls and races click. Replacement of the joint or shaft is needed.

22. B — A whine that tracks road speed rather than engine speed comes from the final drive ring and pinion inside the transaxle. Those gears turn with vehicle speed, unlike clutch or pilot bearing faults. Worn final drive teeth produce the speed-linked whine.

23. D — Inserting a shipping plug or an old joint stub holds the differential side gears in 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.

24. A — A shudder felt only under hard acceleration, with no turning clicks, points to a worn or binding inboard tripod (plunge) joint. The plunge joint handles axial movement under torque and shudders when worn. The outer joint, by contrast, clicks on turns.

25. A — A transaxle integrates the transmission and differential into one unit, so Technician A is right. It does not use a separate rear driveshaft, which makes Technician B wrong. Only Technician A is right.

26. C — A cracked outer boot slinging grease calls for replacing the boot and repacking the joint, or replacing the joint or half shaft. Resealing a contaminated joint or waiting for noise guarantees failure. Prompt service prevents joint destruction.

27. B — A whirring or grinding in neutral at idle with the clutch engaged comes from a worn input shaft bearing or input-side gear that turns whenever the engine drives the input. CV and wheel-bearing faults appear while driving, not at rest. The constant-mesh input components are the source.

28. D — A steady drone that rises with road speed and ignores braking and throttle changes 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.

29. C — A leak and low fluid at the right inner CV area trace to the right axle (output) shaft seal at the differential. The vent and outer boot do not release gear oil there, and a cracked ring gear is far less likely. Replacing the seal stops the loss.

30. A — A vibration that begins near 45 mph and grows with speed, unaffected by engine load, commonly comes from a worn driveshaft universal joint. The worn needle bearings allow the shaft to run out of true at speed. Clutch, synchronizer, and side-gear faults do not match this pattern.

31. B — With the U-joints checked, the next sources of a neutral-to-drive clunk are slip-yoke spline play and differential pinion-to-side-gear lash. These clearances take up suddenly when torque is applied. Inspecting them locates the remaining free play.

32. D — Reassembling a driveshaft in the wrong phase leaves it out of balance, producing a speed-related vibration. Phasing marks keep the yokes aligned to preserve factory balance. Ignoring them reintroduces the shake.

33. C — The slip yoke lets the driveshaft change length as the suspension moves the axle up and down. This sliding spline accommodates the changing distance between transmission and axle. Without it, the driveline would bind over bumps.

34. A — A constant hum that does not change with drive, coast, or turning indicates a worn pinion or carrier bearing. Bearing noise is load-independent, unlike gear noise that varies with throttle. The steady character isolates a bearing.

35. B — With a crush sleeve, the technician must avoid over-tightening the pinion nut, which would crush the used sleeve further and ruin the preload. Excess crush cannot be backed off and requires a new sleeve and full setup. Marking the nut position protects the original preload.

36. B — When limited-slip chatter persists after correcting the gear oil and friction modifier, the next suspect is worn clutch plates or discs inside the carrier. Worn friction surfaces grab instead of slipping smoothly. Rebuilding the clutch pack cures the shudder.

37. D — Changing from 3.08:1 to 4.10:1 raises the numerical ratio, improving low-speed acceleration while increasing engine rpm at any given road speed. More torque multiplication trades highway efficiency for launch. The engine spins faster at cruise as a result.

38. C — On a C-clip axle the wheel bearing typically rides directly on the machined axle shaft surface, with its race seated in the housing bore. There is no pressed-on inner race or separate retainer in this integral design. The shaft itself serves as the bearing journal.

39. A — Dark, thin, burnt-smelling gear oil indicates overheating from heavy loading or a low lubricant level. The breakdown of the oil and odor signal excessive heat. Refilling and investigating the load or leak is required.

40. D — Backlash that is too tight is corrected by moving the ring gear away from the pinion using the carrier side adjusters. Increasing the clearance brings backlash into the specified range. Pinion shims and spacers control depth and preload, not backlash.

41. B — A cover-area leak with a correct fluid level points to a failed cover gasket or sealant and loose cover bolts. Pinion and axle seals leak elsewhere, and the vent is not the source here. Resealing and torquing the cover stops the leak.

42. C — Engaging a locking differential on dry pavement during a tight turn forces both wheels to turn together, causing tire scrub and driveline binding. The locked axle cannot accommodate the different wheel paths. This windup stresses the driveline and tires.

43. A — Because a semi-floating axle shaft carries the vehicle weight as well as torque, a fracture at the flange can let the wheel separate from the vehicle. The bearing rides on the shaft, so a broken shaft loses wheel retention. This is the key safety hazard of the design.

44. D — Pinion depth is set correctly by selecting the proper shim and reading the resulting tooth-contact pattern. The pattern shows whether the pinion sits too deep or too shallow. Side adjusters and spacers handle backlash and preload separately.

45. B — A positraction limited-slip differential uses clutch packs that resist speed difference and send torque to the wheel with better traction. This prevents all power escaping through a spinning wheel. The clutch action defines the limited-slip behavior.

46. A — Difficulty shifting out of four-wheel drive after dry pavement is caused by driveline windup binding the transfer case until the stored tension releases. The locked front and rear axles cannot accommodate the turning differences on high-traction surfaces. Backing up briefly relieves the bind.

47. C — In a viscous coupling, a speed difference shears the silicone fluid, which thickens and transfers more torque to the slower output. The fluid's resistance progressively couples the front and rear. No mechanical clutch or electronic control is involved.

48. D — A growl and vibration that rise with speed and persist while coasting straight indicate a worn driveline bearing such as a carrier or wheel bearing. Bearing noise is constant and speed-related, unlike clutch or brake faults. Locating the worn bearing resolves it.

49. C — Automatic locking hubs engage the front wheels to the axle shafts when the transfer case is shifted into four-wheel drive and torque is applied. The applied torque drives the hub mechanism into lock. They release when 4WD is disengaged and torque reverses.

50. B — The first step on an electronic-shift transfer case complaint is to verify fluid level, battery voltage, and any stored trouble codes. These basic checks catch the most common and easily fixed causes before deeper diagnosis. Replacing parts first risks wasted effort.