# PRACTICE EXAM 18: ASE A3 SIMULATION (50 QUESTIONS)

**50 Questions · 60-Minute Time Limit**

1. A clutch pedal stays partially pressed and slowly creeps back up after the driver releases it. On a hydraulic system, the MOST likely cause is:

A. A worn pilot bearing binding the input shaft nose

B. A glazed clutch driven disc slipping under engine torque

C. A failing master cylinder return port or seal restricting flow

D. A worn release bearing dragging against the diaphragm fingers

2. A clutch is being installed with a new disc and pressure plate, but the technician reuses the original release bearing. The MOST likely consequence is:

A. Improved release performance and a smoother pedal feel

B. A repeat clutch teardown when the original bearing fails soon

C. Permanent damage to the speedometer driven gear teeth

D. An increase in the final drive ratio measured at the wheels

3. A clutch chatter complaint is investigated, and the technician finds a small leak from the rear main seal. The recommended action is to:

A. Repair the rear main seal and inspect the disc for oil contamination

B. Install a heavier viscosity engine oil to slow the leak rate

C. Resurface only the pressure plate face and reinstall the disc

D. Apply silicone sealant around the rear main seal carrier

4. A pilot bushing is being installed in the end of the crankshaft. The technician must drive the bushing in with a:

A. Hardened punch directly against the inner bore surface

B. Standard hammer striking the outer rim of the bushing

C. Heated press tool that softens the bushing material first

D. Properly sized driver that contacts the outer edge of the bushing

5. A clutch hydraulic system uses brake fluid. Filling it with a fluid not labeled for clutch use will MOST likely:

A. Permanently improve the pedal feel and clutch service life

B. Swell and destroy the rubber seals inside the cylinders

C. Increase the final drive gear ratio measured at the wheels

D. Lower the operating temperature of the clutch hydraulics in use

6. A driver complains of a clutch that grabs when starting from a stop, even with smooth pedal release. After the powertrain mounts pass inspection, the MOST likely cause is:

A. Oil-contaminated friction facings or worn cushion springs

B. Air trapped inside the clutch master cylinder bore area

C. A weak pressure plate diaphragm spring reducing clamp load

D. A worn release bearing dragging on the diaphragm fingers

7. A clutch alignment tool is used during clutch installation primarily to:

A. Measure the runout of the engine flywheel face accurately

B. Set the correct preload on the release bearing collar

C. Center the driven disc with the crankshaft pilot bearing bore

D. Test the master cylinder pushrod adjustment for free play

8. A manual transmission grinds going into every forward gear from a stop but shifts smoothly between gears once moving. The MOST likely cause is:

A. Worn synchronizers in every individual gear position

B. A worn output shaft bearing in the rear extension housing

C. A low gear lubricant level affecting all of the gearsets

D. A clutch that is not fully releasing the input shaft at rest

9. A growling noise from a manual transmission is present only in fifth (overdrive), and the unit is quiet in all other gears. The MOST likely source is:

A. Worn countershaft cluster gear bearings in the case

B. Worn fifth-gear teeth or its supporting bearing assembly

C. A worn pilot bearing seated in the engine crankshaft

D. A worn release bearing under continuous clutch pressure

10. Excessive end play of a transmission output shaft is corrected by:

A. Selecting the proper thickness selective shim or thrust washer

B. Tightening the extension housing bolts to a higher torque

C. Replacing the synchronizer blocking rings on every shift hub

D. Adding a heavier viscosity gear lubricant to the case

11. A manual transmission jumps out of fourth gear under acceleration. Technician A says worn fourth-gear clutching teeth can cause it. Technician B says a worn or bent third-fourth shift fork can also cause it. 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 whining noise from a manual transmission is loudest in second gear, fades in higher gears, and disappears in direct drive. The MOST likely source is:

A. A worn input shaft pilot bearing in the crankshaft bore

B. A worn release bearing under continuous clutch pressure

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

D. Worn second-gear teeth or its mating cluster gear set

13. A manual transmission leaks gear oil at the speedometer drive housing on the tailshaft. The MOST likely cause is:

A. A worn O-ring or seal on the speedometer drive sleeve

B. An overfilled gearbox forcing oil out through the vent

C. A cracked extension housing near the transmission mount

D. A loose drain plug at the bottom of the main case

14. A reverse gear is non-synchronized on most manual transmissions. The MOST likely reason is that:

A. Reverse uses fewer gear teeth, simplifying the mesh design

B. Reverse always operates at idle, eliminating the need for matching

C. Reverse is engaged from a complete stop, where speed matching is unneeded

D. Synchronizers cannot work on gears that change rotation direction

15. A clicking or knocking noise from the bell housing area at idle in neutral, that quiets when the clutch pedal is depressed, MOST likely points to:

A. A worn input shaft bearing or worn pilot bearing turning at idle

B. A worn output shaft bearing under road load conditions

C. Worn synchronizer rings on the third-fourth shift hub

D. Normal engine combustion noise transmitted through the case

16. A manual transmission specifies a GL-4 lubricant. Using a GL-5 oil in its place can:

A. Improve cold-weather shifting in any climate condition

B. Raise the lubricant level above the fill plug hole

C. Lower the gear oil operating temperature noticeably

D. Damage brass synchronizer parts from aggressive extreme-pressure additives

17. A clutch hydraulic system is being bled after a slave cylinder replacement. The MOST likely indication that bleeding is complete is:

A. The pedal becomes soft and easily reaches the floor

B. The pedal feels firm and the clutch fully releases as designed

C. The brake fluid in the reservoir turns dark over time

D. The release bearing remains in contact with the diaphragm fingers

18. A driveline whine that increases with vehicle speed and is unaffected by throttle position MOST likely originates in the:

A. Clutch driven disc slipping under acceleration loads

B. Synchronizer blocking ring in the third-fourth hub

C. Final drive ring-and-pinion gears or wheel bearings

D. Transmission third-gear synchronizer cone surface

19. A FWD vehicle clicks during slow tight turns and is silent driving straight. The MOST likely cause is:

A. A worn outer CV joint articulating at full steering lock

B. A loose front wheel bearing with excessive radial play

C. A worn lower control arm bushing flexing during turning

D. A worn inboard plunge joint loading under acceleration

20. A FWD transaxle final drive uses a 19-tooth pinion and a 72-tooth ring gear. The final drive ratio is closest to:

A. 4.00:1

B. 3.50:1

C. 3.79:1

D. 4.25:1

21. A FWD half shaft is being reinstalled. The hub nut is torqued to specification primarily to:

A. Set the final drive backlash inside the transaxle case

B. Adjust the outer CV joint internal operating clearance

C. Correctly preload the wheel bearing and seat the joint

D. Center the brake rotor against the wheel hub face

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

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

B. Cannot transmit drive torque to the wheel under any condition

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

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

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

A. The transaxle vent or breather releasing fluid under pressure

B. The outer CV boot throwing grease at highway speed conditions

C. A cracked CV joint housing leaking grease past the worn boot

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

24. A FWD vehicle has a shudder under hard acceleration that disappears off throttle, with no clicking on turns. The MOST likely cause is:

A. A worn outer CV joint nearest the front wheel hub assembly

B. A worn or binding inboard tripod (plunge) joint under torque

C. A slipping clutch disc flaring under acceleration loads only

D. A worn front wheel bearing humming under cornering conditions

25. A clicking is heard only during tight left turns and is absent driving straight. The MOST likely cause is:

A. A worn right-side inboard plunge joint under acceleration

B. A worn left-side outer CV joint loaded during left turns

C. A worn right-side outer CV joint loaded during left turns

D. A worn left front wheel bearing humming under load

26. A FWD vehicle has a humming noise that rises steadily with road speed and changes when the steering is loaded left or right. After tires check out, the MOST likely cause is:

A. A worn front wheel bearing reacting to cornering loads

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

C. A slipping clutch disc under light throttle conditions only

D. A warped brake rotor pulsing through the steering wheel

27. A FWD transaxle leaks fluid from a seam at the bottom of the case, between the two halves. The MOST likely cause is:

A. A worn axle shaft seal at one of the differential side gears

B. A worn input shaft seal behind the clutch release bearing

C. An overfilled transaxle venting fluid through the breather

D. A failed case-half gasket or sealant joint between the halves

28. 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. Held in alignment using a shipping plug or old joint stub

C. Replaced with a new set whenever the shafts are removed

D. Torqued to a higher specification than original factory value

29. A FWD vehicle pulls to one side under hard acceleration and self-centers off throttle. This torque steer is MOST influenced by:

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

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

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

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

30. A FWD outer CV boot is torn and slinging grease, but the joint is still quiet. The recommended service is to:

A. Add fresh CV grease and reseal the boot with new clamps

B. Wait until the joint becomes noisy before any service work

C. Replace the wheel bearing and the brake rotor on that corner

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

31. A RWD vehicle has a vibration that increases with road speed and is unaffected by engine load or gear selection. After tires are balanced, the MOST likely cause is:

A. A worn third-gear synchronizer blocking ring assembly

B. A bent driveshaft or out-of-balance driveline component

C. A worn differential side gear in the carrier assembly

D. A slipping clutch disc flaring under light throttle conditions

32. A clunk is heard from the driveline each time a RWD vehicle is shifted between drive and reverse. After the U-joints check good, the next item to inspect is the:

A. Clutch master cylinder pushrod free play setting and travel

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

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

D. Transmission second-gear synchronizer blocker ring set

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

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

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

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 two-piece driveshaft has a rumble that rises with road speed and is felt through the floor. After the U-joints check good, the next item to inspect is the:

A. Clutch master cylinder pushrod free play setting and travel

B. Differential side bearing preload set by the carrier adjusters

C. Transmission second-gear synchronizer blocking ring assembly

D. Center support bearing and its rubber isolator condition

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

A. A worn pinion bearing growling at every throttle position

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

C. A bent axle shaft wobbling once per wheel revolution

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

36. During differential setup, a thinner pinion depth shim is installed. Compared with the prior shim, the new shim:

A. Increases the carrier bearing preload across the unit

B. Crushes the collapsible spacer to a higher preload reading

C. Moves the pinion outward, away from the ring gear

D. Tightens the ring gear backlash to a looser value

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

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

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

C. Replace the crush sleeve and reset the preload from scratch

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

38. A limited-slip differential chatters during slow tight turns. After the gear oil and friction modifier are addressed and the chatter remains, the MOST likely cause is:

A. Ring-and-pinion backlash adjusted too loosely at 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 plates inside the carrier

39. A rear axle ratio is changed from 3.42:1 to 3.08:1. Compared with the original, the new ratio will MOST likely:

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

B. Have no measurable change in cruise rpm or acceleration

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

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

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

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

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

C. Presses the wheel bearing off the outer end of the shaft

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

41. Compared with a semi-floating axle, a full-floating axle shaft:

A. Carries the vehicle weight and the drive torque to the wheel

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

C. Is found only on the front axles of passenger cars on highways

D. Carries drive torque only, with vehicle weight on the spindle

42. A rear axle leaks lubricant onto the inside of one rear brake drum or rotor only. The MOST likely cause is:

A. A worn axle shaft seal at that wheel end of the housing

B. A worn pinion seal leaking at the front yoke area only

C. An overfilled axle venting fluid through the housing breather

D. A loose differential cover with a failed paper gasket joint

43. During ring-and-pinion setup, backlash is too tight at 0.003 in versus a 0.006–0.010 in spec. The correct adjustment is to:

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

B. Move the ring gear away from the pinion with the carrier side adjusters

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

D. Replace both carrier bearings with oversized service parts

44. A locking differential is engaged on dry pavement during a tight low-speed turn. The driver will MOST likely notice:

A. Reduced steering effort and noticeably smoother cornering

B. A pinion seal leak developing at the front yoke under load

C. Tire scrub, driveline binding, and difficulty completing the turn

D. Improved fuel economy from reduced differential losses

45. An open differential delivers driving torque such that:

A. Both wheels receive equal torque while allowing different speeds

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

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

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

46. A part-time 4WD truck driven on dry pavement in four-wheel drive develops driveline binding and "crow-hop" during tight turns. This is:

A. A sign of a stretched transfer case chain skipping the sprocket teeth

B. Caused by a failed front axle disconnect actuator motor stuck on

C. Caused by low transfer case fluid binding the internal shift fork

D. Normal driveline windup that occurs on high-traction surfaces

47. A viscous coupling used 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

48. A 4WD vehicle has a humming noise that rises with road speed and is unaffected by turning. 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

49. 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. Connect the front wheels to the half shafts only when engaged

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

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

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 neutral stop position

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

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

# PRACTICE EXAM 18: ANSWER KEY AND EXPLANATIONS

**1. C** — A pedal that creeps back slowly indicates a failing master cylinder return port or seal that restricts fluid return to the reservoir. Trapped pressure keeps the slave partly extended until it bleeds off. Replacing the master cylinder restores quick pedal return.

**2. B** — Reusing the original release bearing during a clutch job almost always leads to a repeat teardown when the worn bearing fails soon after. The bearing wears at the same rate as the disc and pressure plate. Replacing it as a set prevents an avoidable comeback.

**3. A** — A rear main seal leak found during a clutch chatter complaint must be repaired, and the disc inspected for oil contamination. Reinstalling a contaminated or new disc over an active leak guarantees repeat chatter or slip. Fixing the leak protects the clutch.

**4. D** — A pilot bushing is driven in with a properly sized driver that contacts the outer edge so force is applied to the strong shoulder, not the inner bore. Striking the bore distorts the bushing and ruins the fit. Correct tooling preserves the press-fit dimension.

**5. B** — A clutch hydraulic system that specifies brake fluid is destroyed by oil-based fluids, which swell and break down the rubber seals inside the cylinders. The incompatible fluid causes leaks and loss of release. Only the specified fluid is safe.

**6. A** — Grabbing on a smooth pedal release, with mounts good, traces to oil-contaminated friction facings or worn cushion (marcel) springs in the disc. Contamination glazes the facings and flattened cushion springs eliminate the progressive take-up. The result is a sudden bite.

**7. C** — A clutch alignment tool centers the driven disc to the crankshaft pilot bearing bore so the transmission input shaft can slide through the splines during installation. Without centering, the input shaft cannot enter the pilot bearing. The tool is removed after the pressure plate is torqued.

**8. D** — Grinding into every forward gear from a stop, with smooth shifts while moving, indicates a clutch that is not fully releasing the input shaft. The spinning input prevents the synchronizers from matching speed at a standstill. Verifying full release is the first step.

**9. B** — Noise confined to one gear isolates the fault to that gear's teeth or its supporting bearing. A cluster, pilot, or release bearing fault would not appear in only one gear. The single-gear symptom points to the fifth-gear set.

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

**11. B** — Both technicians are right: worn fourth-gear clutching teeth let the gear walk out, 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.

**12. D** — A whine that peaks in second and fades in higher gears, disappearing in direct, points to worn second-gear teeth or its mating cluster gear. In direct drive the gear is unloaded, so the noise vanishes. The load pattern isolates the second-gear set.

**13. A** — A leak at the speedometer drive housing comes from a worn O-ring or seal on the speedometer drive sleeve. That seal contains lubricant where the sleeve enters the case. Replacing the small O-ring stops the leak.

**14. C** — Reverse is non-synchronized because it is engaged from a complete stop, where there is no need to match the speeds of the gear and shaft. Without rotation, no synchronizer action is required. This simplifies the reverse design.

**15. A** — A click or knock at idle in neutral that quiets when the clutch is depressed points to a worn input shaft bearing or pilot bearing turning while the engine drives the input. Disengaging the clutch unloads those components. Their wear creates the idle noise.

**16. D** — A GL-5 oil 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.

**17. B** — Bleeding is complete when the pedal feels firm and the clutch fully releases. A soft pedal indicates remaining air. Firm feel with proper release confirms the system is free of air.

**18. C** — A driveline whine that rises with vehicle speed and is unaffected by throttle comes from the final drive ring-and-pinion or wheel bearings, which turn with road speed. Clutch and synchronizer faults change with engine speed and load. The speed-linked whine isolates the road-speed components.

**19. A** — A clicking on slow tight turns, absent when straight, is the classic symptom of a worn outer CV joint that articulates at full steering lock. The worn balls and races click under load at high angles. Replacement of the joint or shaft is required.

**20. C** — Final drive ratio is ring teeth divided by pinion teeth, so 72 ÷ 19 equals approximately 3.79:1. The pinion turns about 3.79 times for each ring gear revolution. This is the closest listed ratio.

**21. C** — 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.

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

**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 vent and outer boot do not release gear oil there, and a cracked housing is far less likely. Replacing the seal stops the loss.

**24. B** — A shudder under hard acceleration that vanishes off throttle, without turning clicks, points to a worn or binding inboard tripod (plunge) joint reacting to torque. The plunge joint handles axial movement under load. Outer joint and clutch faults present differently.

**25. C** — A click during tight left turns comes from the right outer CV joint, because the right wheel is the outside wheel on a left turn and its outer joint articulates at the greatest angle. The worn, loaded joint clicks. The noisy joint is opposite the turn direction.

**26. A** — A hum that rises with speed and shifts when the steering is loaded left or right is a worn front wheel bearing reacting to cornering loads. Side loading transfers weight onto the worn bearing, changing the noise. This load sensitivity confirms the bearing.

**27. D** — A leak at a seam at the bottom of the case between the two halves comes from a failed case-half gasket or sealant joint between the halves. The other listed seals leak in different locations. Resealing the case halves stops it.

**28. B** — 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.

**29. A** — Torque steer pulling under acceleration and self-centering 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.

**30. D** — A torn outer boot slinging grease, even with a quiet joint, calls for replacing the boot and repacking, or replacing the joint or shaft. Resealing a contaminated joint or waiting for noise guarantees failure. Prompt service prevents joint destruction.

**31. B** — A vibration tied to road speed and unaffected by load or gear, after balancing the tires, indicates a bent driveshaft or unbalanced driveline component. Driveshaft imbalance is speed-dependent and load-independent. Clutch and synchronizer faults do not fit.

**32. C** — A clunk on every drive-to-reverse shift, 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.

**33. A** — 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. D** — A speed-related rumble felt through the floor on a two-piece driveshaft, with good U-joints, points to the center support bearing and its rubber isolator condition. The bearing supports the shaft midpoint and turns with vehicle speed. Its wear produces the rumble.

**35. B** — 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.

**36. C** — A thinner pinion depth shim moves the pinion outward, away from the ring gear. The shim sits behind the pinion and controls how far inward it sits. Backlash and preload are adjusted elsewhere.

**37. A** — To preserve the 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.

**38. D** — Limited-slip chatter that persists after correcting the gear oil and friction modifier indicates worn or glazed clutch plates inside the carrier. The friction surfaces grab instead of slipping smoothly. Rebuilding the clutch pack cures the shudder.

**39. C** — Moving from 3.42:1 to 3.08:1 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.

**40. B** — A C-clip axle shaft comes out only after the differential cover and the pinion (cross) shaft are removed so the 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.

**41. D** — A full-floating axle shaft carries drive torque only, while the vehicle weight rides on the spindle through dual hub bearings. This separation lets a broken shaft be removed without the wheel falling off. It is why heavy trucks use this design.

**42. A** — Lubricant inside one brake assembly only comes from a worn axle shaft seal at that wheel end of the housing. A pinion seal leaks at the front yoke, and a cover leak appears at the rear of the housing. The axle seal is the local source.

**43. B** — Backlash that is too tight is corrected by moving the ring gear away from the pinion with the carrier side adjusters. Increasing the clearance brings backlash into spec. Pinion shims and spacers control depth and preload, not backlash.

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

**45. A** — 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.

**46. D** — Binding and crow-hop during tight turns on dry pavement in four-wheel drive is normal driveline windup that occurs on high-traction surfaces. The locked front and rear axles cannot accommodate the turning speed differences. Backing up or returning to two-wheel drive relieves it.

**47. 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.

**48. A** — A hum that rises with road speed and is unaffected by turning, 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.

**49. B** — 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.

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