PRACTICE EXAM 4: ASE A3 SIMULATION (50 QUESTIONS)

50 Questions · 60-Minute Time Limit

1. A clutch makes a high-pitched squeal heard only while the pedal is fully depressed, which disappears as soon as the pedal is released. The MOST likely cause is:

A. A worn pilot bearing in the end of the crankshaft

B. A dry or worn clutch release (throw-out) bearing

C. Worn friction facings on the clutch driven disc

D. A cracked diaphragm spring in the pressure plate

2. During a clutch replacement, the flywheel friction surface shows hard, glazed, blue-black discoloration. This condition is MOST likely caused by:

A. Normal break-in wear during the first weeks of service

B. An overfilled transmission allowing fluid onto the disc

C. A misadjusted clutch pedal with too much free play

D. Heat from clutch slippage scoring and hardening the surface

3. A hydraulically operated clutch will not fully disengage, yet the fluid reservoir is full. Technician A says air in the hydraulic circuit can cause this. Technician B says a stretched clutch cable is the cause. 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

4. All of the following can cause a clutch to slip EXCEPT:

A. Excessive free play in the clutch release linkage

B. Oil contamination soaking into the friction disc

C. A weak or broken pressure plate diaphragm spring

D. Worn friction facings near their riveted wear limit

5. A clutch pedal stays on the floor after being pressed and must be pulled up by hand. On a cable-operated clutch, the MOST likely cause is:

A. Air trapped inside the clutch master cylinder bore

B. A worn release bearing dragging on the input shaft

C. A broken or binding over-center pedal return spring

D. Excessive runout in the clutch driven disc assembly

6. A manual transmission grinds when shifting into third gear only, while all other gears shift cleanly. The MOST likely cause is:

A. The clutch is not releasing because of low hydraulic fluid

B. A worn synchronizer assembly serving the third-gear position

C. Low gear lubricant causing all of the gears to run hot

D. A bent shift rail preventing full travel into every gear

7. A transmission slips out of fifth gear during deceleration on the highway. The LEAST likely cause is:

A. A worn or weak detent spring and ball in the shift housing

B. Worn clutching teeth on the fifth-gear synchronizer hub

C. A worn shift fork allowing the collar to slide out of mesh

D. A dry input shaft pilot bearing pressed into the crankshaft

8. A whining noise from a manual transmission is present in all gear positions and remains while coasting in neutral with the engine running. The MOST likely source is:

A. Worn synchronizer blocker rings on the upper shift hub

B. A worn output shaft bearing in the tailshaft housing

C. Worn input shaft and countershaft bearings in constant mesh

D. A worn pilot bearing contacting the input shaft snout

9. Before removing a manual transmission for clutch service on a rear-wheel-drive vehicle, the technician should first:

A. Mark the driveshaft and flange so it is reinstalled in phase

B. Set the differential ring gear backlash to specification

C. Crush the collapsible pinion spacer to set bearing preload

D. Adjust the front wheel bearing preload to factory torque

10. A transmission is hard to shift into reverse and reverse grinds, but all forward gears engage smoothly. On a unit with a non-synchronized reverse, the MOST likely cause is:

A. A worn reverse-gear synchronizer blocking ring assembly

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

C. Low lubricant level starving the reverse idler gear of oil

D. A worn output shaft bearing creating excessive end play

11. A light fuzz of metal particles found on the magnetic drain plug of a manual transmission MOST likely indicates:

A. Normal gear and bearing wear within acceptable limits

B. A cracked transmission case leaking near the bell housing

C. Contaminated clutch friction facings shedding into the case

D. A failed input shaft seal allowing engine oil to enter

12. A manual transmission leaks gear oil at the rear of the tailshaft housing. The MOST likely cause is:

A. An overfilled case forcing oil past the shift cover gasket

B. A cracked extension housing near the transmission mount

C. A worn output shaft seal allowing oil to escape past the yoke

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

13. Technician A says topping a manual transmission with the wrong viscosity lubricant can cause hard cold shifting. Technician B says some manual transmissions are designed to use automatic transmission fluid. 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

14. A growling noise from a typical RWD manual transmission is loudest in fourth gear (direct drive). This MOST likely indicates a problem with the:

A. Countershaft (cluster gear) bearings carrying the load

B. Third-gear synchronizer hub and its blocking ring

C. Input shaft bearing supporting the front of the case

D. Output shaft rear bearing in the extension housing

15. A clutch is being replaced. Technician A says the driven disc can be installed with either side facing the flywheel. Technician B says many discs are marked "flywheel side" and must be installed in the correct orientation. 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

16. A pilot bearing or bushing is being replaced during clutch service. Its primary function is to:

A. Support and center the front of the transmission input shaft

B. Carry the full vehicle weight transferred through the axle

C. Set the running clearance of the pressure plate fingers

D. Provide the preload adjustment for the release bearing travel

17. A clutch alignment tool is used during installation to:

A. Measure the free play remaining in the clutch linkage

B. Set the correct preload on the throw-out bearing collar

C. Check the flywheel surface for runout before assembly

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

18. A front-wheel-drive transaxle whines during acceleration, and the noise changes pitch with vehicle speed rather than engine speed. The MOST likely cause is:

A. A slipping clutch disc under light throttle loads

B. Worn final drive ring and pinion gears inside the transaxle

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

D. Air trapped in the hydraulic clutch release circuit lines

19. A clicking noise from the front of a FWD vehicle increases during tight, low-speed turns. The MOST likely cause is:

A. A worn inboard tripod (plunge) joint on the half shaft

B. A loose wheel bearing allowing excessive hub movement

C. A worn outer constant-velocity (CV) joint on the half shaft

D. A worn transaxle final drive bearing under cornering load

20. A clunk or shudder felt during hard acceleration from a stop in a FWD vehicle, with no noise while turning, MOST likely points to:

A. A worn inboard tripod (plunge) CV joint on a drive axle

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

C. A dry clutch release bearing contacting the diaphragm

D. A loose differential pinion shaft inside the transaxle case

21. A torn outer CV joint boot is found during inspection, with grease thrown around the wheel well but no noise yet. The correct service action is to:

A. Add fresh grease and wrap the boot tightly with tape

B. Ignore it until a clicking noise actually develops on turns

C. Replace the wheel bearing along with the brake rotor

D. Replace the boot and joint, or the complete half-shaft assembly

22. A FWD transaxle drips lubricant where the half shaft enters the differential. The MOST likely cause is:

A. An overfilled transaxle venting fluid through the breather

B. A loose drain plug that has not been torqued correctly

C. A worn axle shaft (output) seal at the differential side gear

D. A cracked CV joint housing leaking grease past the boot

23. Technician A says a half shaft must be marked for length and reinstalled to the same side. Technician B says the inboard joint of a half shaft is usually the plunge-type that allows in-and-out movement. 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

24. During a FWD half-shaft removal, the axle nut is found to be a one-time-use design. Reusing it can result in:

A. A torn outer CV boot from over-tightening the clamp

B. A loose wheel hub from a fastener that cannot hold torque

C. Incorrect final drive backlash inside the transaxle case

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

25. A FWD vehicle vibrates and the steering wheel shakes at highway speed, smoothing out at lower speeds. After tires are ruled out, the MOST likely driveline cause is:

A. A bent or out-of-balance half shaft creating a speed vibration

B. A worn outer CV joint clicking during cornering maneuvers

C. A slipping clutch disc allowing the engine to flare up

D. A worn transaxle input bearing humming under acceleration

26. A transaxle is being filled after service. The correct lubricant level for most manual transaxles is:

A. Two inches below the bottom edge of the fill plug hole

B. Up to the top of the differential ring gear teeth only

C. Even with the bottom of the fill plug opening when level

D. Halfway up the dipstick tube marked on the housing side

27. On many transverse FWD powertrains, engine torque reaction is controlled by:

A. A viscous coupling mounted between the half shafts

B. The collapsible spacer behind the differential pinion

C. The synchronizer detent springs inside the shift housing

D. A torque-strut (dog-bone) mount linking engine to the body

28. Unequal-length half shafts on some FWD vehicles can cause torque steer. An intermediate shaft is sometimes added to:

A. Equalize half-shaft length and reduce torque steer pull

B. Increase the final drive ratio for better fuel economy

C. Provide a mounting point for the clutch release fork

D. Lock the differential during hard straight-line acceleration

29. A FWD transaxle shifts hard into all gears when cold but improves once warm. Technician A says worn synchronizers in every gear are the cause. Technician B says thick or incorrect lubricant can cause cold hard shifting. 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

30. A RWD vehicle has a vibration that increases with vehicle speed and a squeaking that slows as the vehicle slows. The MOST likely cause is:

A. A worn pinion seal allowing the rear axle to leak fluid

B. A loose lug nut letting the wheel shift on the hub face

C. A worn or dry universal joint in the driveshaft assembly

D. A glazed clutch disc slipping under light acceleration loads

31. A clunk is heard from under a RWD vehicle each time the transmission is shifted between drive and reverse or when accelerating from a stop. The MOST likely driveline cause is:

A. Worn universal joints or excessive slip-yoke spline play

B. A slipping clutch disc near the end of its service life

C. A worn outer CV joint on a front-wheel-drive half shaft

D. Low lubricant level inside the manual transmission case

32. When replacing a driveshaft, the slip yoke and rear flange are marked before disassembly in order to:

A. Identify which universal joint was the noisiest in service

B. Record the lubricant type used in the slip-yoke splines

C. Set the correct pinion bearing preload during reassembly

D. Maintain the original driveshaft balance and phasing on reinstall

33. Incorrect driveshaft (universal joint) operating angles on a RWD vehicle MOST commonly produce:

A. A clicking noise that occurs only during low-speed turns

B. A grinding felt through the clutch pedal during engagement

C. A whine that varies directly with engine rpm at idle only

D. A vibration that worsens as vehicle speed and load increase

34. A RWD axle howls under steady cruise but quiets during coasting. The MOST likely cause is:

A. Worn axle shaft bearings on both ends of the housing

B. Incorrect ring-and-pinion tooth contact or worn gear teeth

C. A loose brake caliper bracket contacting the rotor edge

D. An out-of-balance driveshaft creating a speed vibration

35. When setting up a ring-and-pinion gear set, the pinion depth in the housing is verified by:

A. Reading the tooth-contact pattern produced with marking compound

B. Measuring the backlash between the two carrier bearing caps

C. Crushing the collapsible spacer to a fixed torque reading

D. Checking the axle shaft end play with a dial indicator gauge

36. Ring gear backlash on a differential carrier is adjusted by:

A. Crushing or shimming the spacer behind the drive pinion

B. Changing the thickness of the pinion depth setting shim

C. Moving the carrier sideways with the side adjuster nuts or shims

D. Adding friction modifier to the differential gear lubricant

37. A limited-slip differential chatters or shudders while turning slowly in a parking lot. The FIRST item to address is:

A. Worn axle shaft bearings allowing sideways shaft movement

B. The condition of the gear oil and its friction-modifier additive

C. The ring-and-pinion backlash being set too tight at assembly

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

38. On a C-clip (C-lock) rear axle, the axle shaft is held in the housing by:

A. A press-fit bearing and retainer plate bolted to the flange

B. A threaded collar that screws onto the outer axle splines

C. A snap ring located in a groove on the outer wheel hub

D. A C-shaped clip in the side gear, retained by the pinion shaft

39. A semi-floating axle shaft on a RWD vehicle carries:

A. Both the vehicle weight and the driving torque to the wheel

B. Only the driving torque, with weight carried by the housing

C. No load at all because the hub rides on the spindle alone

D. Only the vehicle weight, with torque carried by the housing

40. A pinion seal is being replaced on a RWD axle. Before removing the pinion nut, the technician should:

A. Drain the differential and remove the carrier assembly first

B. Crush a new collapsible spacer to preset the bearing preload

C. Mark the nut and yoke and record the pinion bearing preload

D. Adjust the ring gear backlash to specification with shims

41. An open differential delivers driving torque such that:

A. Both drive wheels always turn at exactly the same speed

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

C. Both wheels receive equal torque while allowing different speeds

D. The wheels lock together whenever the vehicle begins to slip

42. A growling noise from a RWD axle is present whether driving or coasting and does not change when turning. The MOST likely cause is:

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

B. A worn limited-slip clutch pack needing friction modifier

C. An incorrectly set ring-and-pinion backlash adjustment

D. A worn outer CV joint on the right rear half shaft assembly

43. Technician A says low differential lubricant can cause overheating and bearing damage. Technician B says using a non-limited-slip lubricant in a limited-slip unit can cause clutch chatter. 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

44. A full-floating axle differs from a semi-floating axle in that the full-floating axle shaft:

A. Supports the full vehicle weight directly on the shaft itself

B. Uses a single bearing pressed onto the outer end of the shaft

C. Is found mainly on the steering axles of passenger cars

D. Carries driving torque only, with weight on the hub and spindle

45. A vibration felt only under hard acceleration on a RWD vehicle, easing off when the throttle is released, MOST likely indicates:

A. A warped brake rotor pulsing through the wheel hub

B. Worn universal joints or a loose pinion flange under load

C. An out-of-balance tire creating a steady highway shake

D. A worn wheel bearing humming at a constant road speed

46. An electronic-shift transfer case flashes its indicator and will not stay in four-wheel drive. After confirming the shift motor runs, the technician should next check the:

A. Rear differential lubricant level and overall fluid condition

B. Clutch pedal position switch and its adjustment setting

C. Front axle disconnect actuator and its engagement feedback

D. Speedometer output sensor on the transmission tailshaft

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

A. Shearing a thick silicone fluid between sets of interleaved plates

B. Engaging a multi-plate clutch with electrohydraulic pressure

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

D. Using an electric solenoid to physically lock the center differential

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

A. Increase the transfer case low-range gear reduction ratio

B. Engage the rear differential for straight-line traction

C. Lock the center differential during highway cruising

D. Connect the front wheels to the half shafts only when needed

49. During a transfer case fluid service, the drained fluid is milky and discolored. This MOST likely indicates:

A. Normal additive separation that clears after the unit warms up

B. Excessive chain stretch shedding metal into the lubricant supply

C. A slipping viscous coupling overheating the silicone fluid inside

D. Water or coolant contamination entering the transfer case housing

50. On a typical part-time 4WD system, the transfer case "neutral" position is used to:

A. Lock the front and rear driveshafts together for traction

B. Disconnect engine power from both axles, such as for flat towing

C. Provide the deepest gear reduction for very low-speed pulling

D. Engage only the front axle while leaving the rear disconnected

PRACTICE EXAM 4: ANSWER KEY AND EXPLANATIONS

1. B — A release (throw-out) bearing only spins against the pressure plate fingers when the pedal is depressed, so a bearing noise that appears with the pedal down and vanishes when released points directly to it. A worn pilot bearing makes noise with the pedal down but in gear, not at rest, which is why the release bearing is the better fit.

2. D — Glazed, blue-black flywheel discoloration is friction heat from a slipping clutch hardening and polishing the metal surface. The slipping disc generates localized heat that cannot dissipate fast enough, scoring and case-hardening the iron. This glazing reduces the coefficient of friction and accelerates further slippage.

3. A — A hydraulic clutch uses fluid, not a cable, so a "stretched cable" cannot exist on this system, eliminating Technician B. Trapped air compresses instead of transmitting pedal force, leaving the disc partially engaged and unable to fully disengage. Bleeding the circuit restores full clutch release.

4. A — Excessive free play in the release linkage causes incomplete disengagement, not slipping; it is the one item that does not cause slip. Slipping comes from anything that reduces clamping force or contaminates the friction surface, such as oil, a weak diaphragm spring, or worn facings. Too *little* free play, not too much, produces slip.

5. C — On a cable clutch the pedal is returned by an over-center or assist spring, so a broken or binding spring lets the pedal rest on the floor. There is no hydraulic fluid in this system, so a master cylinder cannot be involved. The pedal must be lifted by hand because nothing pulls it back up.

6. B — Grinding confined to one gear isolates the fault to that gear's synchronizer, which is failing to match shaft speeds before engagement. A clutch or low-lube problem would affect all gears, not just third. The synchronizer's worn blocker ring or cone allows the dog teeth to clash.

7. D — A dry pilot bearing produces noise and disengagement complaints but does not cause a transmission to jump out of gear, making it the least likely cause. Gear jumpout comes from worn detent springs, worn synchronizer clutching teeth, or worn shift forks that let the collar walk out of mesh under load. The pilot bearing plays no role in holding a gear engaged.

8. C — In neutral with the engine running and clutch engaged, only the input shaft and the constantly meshed countershaft are turning, so a whine there indicates those bearings. The output shaft is stationary in neutral, ruling out the tailshaft bearing. Because the noise also continues in every gear, the constant-mesh bearings are confirmed.

9. A — Marking the driveshaft and flange before removal preserves the factory rotational phasing and balance when the shaft is reinstalled. The other items belong to differential or wheel-bearing service, not transmission removal. Reinstalling a driveshaft out of phase introduces a speed-related vibration.

10. B — Most reverse gears are non-synchronized, so a dragging clutch that fails to fully release the input shaft makes reverse grind while synchronized forward gears still engage. The synchronizers in the forward gears mask the clutch drag, but reverse has none to compensate. Verifying full clutch release is the first step.

11. A — A light fuzz of fine ferrous particles on a magnetic drain plug is normal break-in and wear material that the magnet is designed to capture. Large chips or chunks would signal a failure, but a thin film is expected. This finding alone does not justify a teardown.

12. C — A leak at the rear of the tailshaft housing comes from the output shaft seal, which rides on the slip yoke or companion flange. An overfill or cracked case would leak elsewhere, and a drain plug sits at the bottom of the main case. Replacing the seal stops the leak.

13. C — Both technicians are right: an incorrect lubricant viscosity thickens when cold and produces hard cold shifting, and many modern manual transmissions are factory-filled with automatic transmission fluid. Using the wrong fluid changes synchronizer drag and shift feel. Always confirm the specified lubricant for the unit.

14. D — In direct drive the output shaft spins at its highest speed and the countershaft is unloaded, so a bearing noise that peaks in fourth points to the output shaft rear bearing. Countershaft bearings are loudest in the indirect gears, not direct. The increased output shaft rpm amplifies a worn rear bearing.

15. B — Technician B is right: many driven discs are stamped "flywheel side" because the hub or damper springs protrude toward the pressure plate and will not seat correctly if reversed. Installing the disc backward can prevent full engagement or cause interference. Always observe the marking.

16. A — The pilot bearing or bushing supports and centers the nose of the transmission input shaft inside the crankshaft. It allows the input shaft to spin independently of the crankshaft when the clutch is disengaged. A worn pilot bearing causes noise and hard shifting from input shaft wobble.

17. D — 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 and the transmission will not seat. The tool is removed once the pressure plate is torqued.

18. B — A whine that tracks with vehicle speed rather than engine speed originates in the final drive ring and pinion inside the transaxle, which turn with road speed. Clutch and pilot bearing faults track engine speed instead. Worn final drive teeth produce the speed-dependent whine.

19. C — A clicking that intensifies during tight, slow turns is the classic symptom of a worn outer CV joint, which articulates most at full steering lock. The outer joint must flex through large angles while transmitting torque, and worn balls or races click under that load. Replacement of the joint or half shaft is required.

20. A — A clunk or shudder felt only during hard acceleration, without turning noise, points to the inboard tripod (plunge) joint that handles in-and-out movement under torque. The outer joint shows up on turns, not straight-line launches. Worn tripod rollers allow the shudder under load.

21. D — A torn boot exposes the joint to dirt and lets grease escape, so the boot and joint—or the complete half shaft—must be replaced even before noise appears. Taping or ignoring it guarantees rapid joint failure once contaminants enter. Prompt replacement prevents a roadside breakdown.

22. C — Lubricant dripping where the half shaft enters the differential comes from the worn axle shaft (output) seal at the side gear. An overfill or loose plug would leak from different points, and a CV boot leaks grease, not gear oil. Replacing the seal stops the transaxle leak.

23. B — Technician B is right that the inboard half-shaft joint is typically the plunge (tripod) type allowing axial movement; Technician A's "mark for length" step is not a standard requirement because half shafts are physically side-specific. The plunge joint accommodates suspension travel and engine rock. Knowing joint type guides the correct service.

24. B — A one-time-use axle nut is designed to stretch or deform once to lock at the proper clamp load, so reusing it leaves the hub under-clamped and prone to loosening. A loose hub nut allows bearing play, runout, and eventual wheel-bearing damage. Always fit a new nut and torque to spec.

25. A — A vibration that grows with road speed and smooths at lower speeds, after tires are cleared, indicates a bent or unbalanced half shaft turning at wheel speed. CV clicking shows on turns and clutch slip flares with engine speed, so neither fits a steady speed shake. Balancing or replacing the shaft resolves it.

26. C — Most manual transaxles are filled until lubricant is level with the bottom of the fill plug opening on a level vehicle. Overfilling causes foaming and seal leaks, while underfilling starves the bearings. The fill plug height sets the correct level.

27. D — Transverse powertrains use a torque-strut or "dog-bone" mount to resist engine rock from torque reaction during acceleration and shifting. Without it, the engine would rotate excessively and produce clunks and harsh shifts. The strut links the engine to the body or subframe.

28. A — An intermediate shaft equalizes effective half-shaft lengths so both sides twist the same amount under torque, reducing torque steer. Unequal-length shafts deliver torque unevenly and pull the steering during acceleration. Equalizing the lengths balances the drive.

29. B — Technician B is right: thick or incorrect lubricant stiffens when cold and causes hard shifting that eases as it warms and thins. Worn synchronizers in *every* gear at once is improbable, eliminating Technician A. Confirming the specified fluid is the first step.

30. C — A vibration that rises with vehicle speed paired with a squeak that slows as the vehicle slows is a dry or worn universal joint, since the squeak occurs once per shaft revolution. A leaking seal or slipping clutch produces neither symptom. Lubricating or replacing the U-joint cures it.

31. A — A clunk each time the driveline loads or reverses direction reflects worn universal joints or excessive slip-yoke spline play taking up lash. The free play allows the components to slam as torque direction changes. A CV joint belongs to FWD, not this RWD driveline.

32. D — Marking the slip yoke and rear flange before disassembly keeps the driveshaft in its original phase and balance when reassembled. Reinstalling it rotated introduces a speed-sensitive vibration. The marks restore factory alignment.

33. D — Incorrect U-joint operating angles create a vibration that intensifies with both vehicle speed and load because the joints accelerate and decelerate twice per revolution. Excessive or unequal angles amplify this fluctuation. Correcting pinion angle or shimming the mount reduces it.

34. B — A howl present under drive load that quiets on coast indicates ring-and-pinion tooth-contact problems or wear, since gear mesh noise changes with load direction. Bearing noise stays constant regardless of throttle. Setup or gear replacement is required.

35. A — Pinion depth is verified by reading the gear tooth-contact pattern with marking compound, which shows whether the pinion sits too deep or too shallow. Backlash and preload are separate adjustments. The pattern guides shim selection behind the pinion.

36. C — Ring gear backlash is set by moving the carrier laterally with the side adjuster nuts or shims, which shifts the ring gear toward or away from the pinion. Pinion shims set depth and the spacer sets preload, not backlash. A dial indicator on the ring gear confirms the spec.

37. B — Chatter from a limited-slip differential during slow turns is most often the friction modifier being depleted or the wrong gear oil being used, so the lubricant is addressed first. The additive lets the clutch plates slip smoothly instead of grabbing. Fresh, correct fluid usually cures the shudder.

38. D — On a C-clip axle, the shaft is retained by a C-shaped clip seated in the side gear, which is held captive by the differential pinion (cross) shaft. The cover and pinion shaft must come off to release the clip before the shaft can slide out. No outer retainer or press-fit bearing locks this design.

39. A — A semi-floating axle shaft carries both the vehicle weight and the driving torque, since the wheel bearing rides on the shaft itself. This is why a broken semi-floating shaft can let the wheel separate from the vehicle. The design is common on light-duty rear axles.

40. C — Before loosening the pinion nut, the technician marks the nut-to-yoke position and records the rotating (preload) torque so the original crush on the collapsible spacer can be restored. Without this reference, reassembly risks over-crushing the spacer and ruining preload. The marks let the seal be replaced without a full setup.

41. C — An open differential always splits torque equally to both wheels while permitting them to rotate at different speeds, which is what allows cornering. It cannot send extra torque to a high-traction wheel, which is why it spins the wheel with the least grip. Equal torque, unequal speed defines the open design.

42. A — A growl that stays the same whether driving or coasting and does not change on turns points to a worn pinion or carrier bearing, because bearing noise is load-independent. Gear (ring-and-pinion) noise changes between drive and coast. Constant growl isolates the bearing.

43. B — Both technicians are right: low lubricant overheats the gears and bearings, and a non-limited-slip oil lacking friction modifier makes the clutch packs chatter. Each failure traces to lubricant condition or specification. Correct fluid type and level address both.

44. D — A full-floating axle shaft carries driving torque only, while the vehicle weight rides on dual hub bearings on the spindle. This lets a broken shaft be removed without the wheel falling off, which is why heavy trucks use it. Weight on the spindle, torque on the shaft defines full-floating.

45. B — A vibration that appears only under hard acceleration and eases off throttle reflects worn universal joints or a loose pinion flange that loads up under torque. Brake, tire, and wheel-bearing faults are not throttle-dependent. Inspecting the joints and flange torque locates the play.

46. C — With the shift motor confirmed running, the next check on a flashing electronic transfer case is the front axle disconnect actuator and its engagement feedback, since the system will not confirm 4WD if the front axle never couples. The disconnect must engage for the indicator to stop flashing. Verifying actuator operation isolates the fault.

47. A — A viscous coupling transfers torque by shearing a thick silicone fluid between sets of interleaved plates as a speed difference develops between front and rear. The fluid thickens under shear and progressively locks the plates. No electronic or mechanical clutch is involved.

48. D — Manual locking hubs connect the front wheels to the half shafts only when engaged, letting the front axle components stop turning when in two-wheel drive. This reduces wear and drag during normal driving. The driver locks them in before using four-wheel drive.

49. D — Milky, discolored transfer case fluid indicates water or coolant contamination, since water emulsifies the oil into a cloudy mixture. Water often enters through the vent during deep crossings or from a leaking cooler. Contaminated fluid must be flushed and the source addressed.

50. B — Transfer case neutral disconnects engine power from both the front and rear axles, which is the position used for flat (four-down) towing. It is not a drive range and provides no gear reduction. Selecting neutral lets all driveline shafts turn freely behind the vehicle.