PRACTICE EXAM 19: ASE A3 SIMULATION (50 QUESTIONS)

50 Questions · 60-Minute Time Limit

1. The component that transmits engine torque from the flywheel into the transmission input shaft is the:

A. Clutch driven (friction) disc splined to the input shaft hub

B. Release bearing seated against the diaphragm spring fingers

C. Pilot bearing pressed into the rear of the engine crankshaft

D. Pressure plate cover bolted onto the engine flywheel face

2. A driver complains that the clutch pedal has become very high and engagement occurs near the top of pedal travel. On a hydraulic clutch system with no external leaks, the MOST likely cause is:

A. A worn pilot bearing inside the crankshaft end bore

B. A glazed clutch driven disc slipping under engine torque

C. A worn release bearing dragging on the diaphragm fingers

D. A worn driven disc worn close to its rivet wear limit

3. A clutch disc is being inspected during a transmission removal. The torsional damper springs in the disc hub are loose and rattle when shaken. The recommended action is to:

A. Reinstall the disc as is and monitor for noise complaints

B. Replace the disc, since the damper springs are no longer effective

C. Lubricate the springs with high-temperature chassis grease

D. Add a thicker shim behind the disc hub during reassembly

4. A clutch will not fully disengage on a hydraulic system, the fluid is full, and there is no air in the line. The next item to check is the:

A. Clutch cable adjustment at the release fork pivot point

B. Differential pinion seal at the front yoke of the rear axle

C. Master or slave cylinder for an internal seal failure or bypass

D. Speedometer driven gear teeth on the transmission tailshaft

5. A flywheel is being measured for runout with a dial indicator after a clutch chatter complaint. The dial indicator's tip rides against the:

A. Flat friction face of the flywheel near the friction ring area

B. Outer edge of the starter ring gear teeth around the perimeter

C. Crankshaft flange behind the flywheel mounting bolts

D. Pressure plate cover after it is bolted onto the flywheel

6. A self-adjusting cable clutch has lost its take-up. The driver will MOST likely notice that the:

A. Clutch pedal sinks slowly to the floor while at a stoplight

B. Pedal effort gradually increases and disengagement worsens

C. Vehicle's engine idle speed drops noticeably at every stop

D. Clutch disc begins to slip noticeably during downhill braking

7. A pilot bearing is being replaced during a clutch job. Its main function is to:

A. Carry part of the vehicle weight transferred through the driveline

B. Set the running clearance of the pressure plate fingers in use

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

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

8. A clutch driven disc has been installed with the wrong side facing the flywheel. The MOST likely result is:

A. The disc hub will not clear the flywheel and the clutch will not engage properly

B. The clutch will operate normally because both sides are identical

C. The release bearing will run dry against the diaphragm fingers continuously

D. The pilot bearing will overheat and fail within the first day of operation

9. A manual transmission grinds going into reverse only, while all forward gears engage smoothly. On a unit with non-synchronized reverse, the FIRST item to check is the:

A. Output shaft bearing for excessive radial play in the housing

B. Differential side gear backlash inside the carrier assembly

C. Clutch for incomplete release that fails to stop the input shaft

D. Speedometer driven gear teeth for excessive wear damage

10. A transmission third-gear set uses a 24-tooth input gear driving a 36-tooth output gear. The third-gear ratio is:

A. 1.00:1 (direct drive)

B. 1.50:1 (underdrive)

C. 0.67:1 (overdrive)

D. 2.50:1 (underdrive)

11. A growling noise from a manual transmission is present in first and second gears, fades in third, and is gone in fourth (direct drive). The MOST likely cause is:

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

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

C. Worn countershaft cluster bearings loaded in the indirect gears

D. A worn release bearing under continuous clutch pedal pressure

12. A manual transmission lubricant analysis turns up fine ferrous particles spread evenly on the magnetic drain plug, with no large chunks. This finding indicates:

A. Normal break-in or accumulated 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 letting engine oil enter the gearbox

13. A transmission jumps out of fifth (overdrive) only on deceleration. Technician A says worn fifth-gear clutching teeth can cause this. Technician B says worn powertrain mounts can cause it by allowing the unit to shift slightly. Who is correct?

A. Technician A only

B. Technician B only

C. Neither Technician A nor Technician B

D. Both Technician A and Technician B

14. A whining noise from a manual transmission is loudest in first 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. Worn first-gear teeth or its mating cluster gear set

C. A worn release bearing under continuous clutch pedal pressure

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

15. A manual transmission leaks gear oil from 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

16. During reassembly of a manual transmission, coating the synchronizer cones and gears with the correct lubricant is done primarily to:

A. Provide initial lubrication and prevent dry-start scoring

B. Permanently seal the bearing surfaces against moisture

C. Set the final backlash between the gear tooth meshes

D. Increase the friction so the synchronizers engage faster

17. A rattling noise from a manual transmission is heard at idle in neutral with the clutch engaged, and it disappears when the clutch pedal is pushed down. The MOST likely cause is:

A. A worn output shaft bearing under tailshaft load condition

B. A worn pilot bearing seizing against the input shaft nose

C. A cracked flywheel ring gear contacting the starter pinion

D. Normal gear rattle from engine torsional pulses at idle speed

18. A small gear placed between the countershaft and output shaft gears to reverse rotation when reverse is selected is called the:

A. Countershaft drive gear assembly inside the gearbox case

B. Reverse idler gear on its own dedicated reverse idler shaft

C. Output shaft speed gear riding on the mainshaft splines

D. Synchronizer blocker ring inside the reverse hub assembly

19. A manual transmission specifies a synthetic 75W-90 GL-4 lubricant. Using a non-synthetic GL-5 lubricant in its place can MOST likely cause:

A. Permanently improved synchronizer engagement in all gears

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

C. A measurable increase in the final drive gear ratio

D. Damage to brass synchronizer parts from aggressive additives

20. A clutch is being released by hydraulic pressure acting on a concentric slave cylinder (CSC). A common failure of this design is:

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

B. A stretched actuating cable losing its self-adjustment range

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

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

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

A. A worn inboard tripod plunge joint loading under acceleration

B. A worn outer CV joint articulating at full steering lock under load

C. A loose front wheel bearing with excessive radial play in the hub

D. A worn lower control arm bushing flexing during turns at slow speed

22. A FWD transaxle final drive uses a 17-tooth pinion driving a 65-tooth ring gear. The final drive ratio is closest to:

A. 4.50:1

B. 3.50:1

C. 4.00:1

D. 3.82:1

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

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

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

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

24. A FWD vehicle has a steady drone that rises with road 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 only

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

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

25. 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. Correctly preload the wheel bearing and seat the joint

C. Adjust the outer CV joint internal operating clearance value

D. Center the brake rotor against the wheel hub face surface

26. A FWD transaxle leaks fluid where the half shaft enters the differential. The MOST likely cause is:

A. An overfilled case venting fluid through the breather port

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

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

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

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

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

B. Filled with extra-pressure assembly lubricant from a tube of grease

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

D. Torqued to a higher specification than the original factory value

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

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

B. A slipping clutch disc under light throttle conditions only

C. A worn front wheel bearing reacting to cornering loads

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

29. A FWD vehicle pulls to one side under hard acceleration and self-centers off throttle. The MOST likely cause is:

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

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

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

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

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

A. An overfilled case venting fluid through the breather port

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

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

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

31. A RWD vehicle has a vibration that begins at about 50 mph and increases with road speed. After tires are balanced, the next item to inspect is the:

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

B. Transmission third-gear synchronizer blocking ring assembly

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

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

32. A two-piece driveshaft uses a center support bearing. The bearing's primary function is to:

A. Increase the rear axle gear ratio for better acceleration response

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

C. Support the driveshaft at its midpoint to reduce vibration

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

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

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

D. Transmission second-gear synchronizer blocker ring set

34. 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

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

A. A worn pinion bearing growling at every throttle position

B. A bent axle shaft wobbling once per wheel revolution

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

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

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

A. Increases the ring gear backlash to a looser value

B. Moves the pinion deeper into mesh with the ring gear

C. Crushes the collapsible spacer to a higher preload value

D. Tightens the carrier bearing preload across the unit assembly

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

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

B. Tighten the pinion nut beyond 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. The FIRST item to address is the:

A. Ring-and-pinion backlash measured between the gear teeth

B. Pinion bearing preload set by the collapsible spacer crush

C. Gear oil condition and the friction-modifier additive content

D. Carrier bearing preload set by the carrier side adjuster nuts

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

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

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

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

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

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

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

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

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

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 both vehicle weight and drive torque to the wheel

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

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

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

42. A rear axle leaks lubricant onto the inside of one rear brake assembly 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. 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. Improved fuel economy from reduced differential losses

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

44. During ring-and-pinion setup, backlash is too tight at 0.002 in versus a 0.006–0.008 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

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. Normal driveline windup that occurs on high-traction surfaces

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

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

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

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

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

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

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

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

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

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

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

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

A. Front axle disconnect actuator and its engagement feedback

B. Rear differential lubricant level and overall fluid condition

C. Clutch pedal position switch and its adjustment setting only

D. Speedometer output sensor on the transmission tailshaft housing

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

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

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

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

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

PRACTICE EXAM 19: ANSWER KEY AND EXPLANATIONS

1. A — The clutch driven (friction) disc transmits engine torque from the flywheel into the input shaft through its splined hub. The pressure plate clamps the disc, but the disc itself carries the torque. The release bearing and pilot bearing play supporting roles, not torque transfer.

2. D — A clutch pedal that engages high in its travel on a leak-free hydraulic system indicates a worn driven disc near its rivet wear limit. As facing material wears, the pressure plate moves closer to the flywheel and the release point rises. Replacing the worn disc lowers the engagement point.

3. B — Loose, rattling damper springs in a clutch disc mean the springs no longer absorb torsional pulses, so the disc must be replaced. The damper protects the driveline and eliminates rattle at idle. Lubrication or shims cannot restore broken springs.

4. C — With the hydraulics full, free of air, and properly adjusted, a clutch that still will not disengage points to a master or slave cylinder leaking internally past its seal. The bypassing fluid does not push the release components fully. Replacing the failed cylinder restores release.

5. A — Flywheel runout is measured by sweeping a dial indicator across the flat friction face while rotating the crankshaft. The ring gear, crankshaft flange, and pressure plate cover are not valid surfaces for face runout. Excessive runout causes engagement problems and chatter.

6. B — A self-adjusting cable clutch that has lost its take-up develops gradually increasing pedal effort and reduced disengagement as the disc wears. The unchecked slack changes lever geometry. The driver feels the symptom progress over time.

7. D — The pilot bearing supports and centers the nose of the input shaft inside the crankshaft, letting it spin independently of the crankshaft when the clutch releases. It does not carry vehicle weight, mount seals, or set release clearance. A worn pilot bearing causes noise and hard shifting.

8. A — Many clutch driven discs have an offset hub that protrudes more on one side, so installing the disc backward will not let the hub clear the flywheel and the clutch will not engage properly. The marking "flywheel side" exists for this reason. Correct orientation is essential.

9. C — Grinding only into a non-synchronized reverse, with clean forward shifts, points to a clutch that is not fully releasing the input shaft. Forward synchronizers mask the drag, but reverse has none. Verifying full clutch release is the first step.

10. B — Gear ratio is driven teeth divided by drive teeth, so 36 ÷ 24 equals 1.5:1, an underdrive ratio. The output turns slower than the input, multiplying torque. This is typical of an indirect (third) gear.

11. C — Noise in indirect gears that fades in direct identifies worn countershaft cluster bearings, which are loaded in every gear except direct. In fourth (direct) the countershaft is unloaded, so the noise disappears. The load pattern isolates the cluster bearings.

12. A — Fine ferrous particles spread evenly on the magnetic drain plug, with no chunks, indicates normal break-in or accumulated wear caught by the magnet. The magnet exists to trap this material. The finding alone does not justify a teardown.

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

14. B — A whine loudest in first that fades in higher gears and disappears in direct drive points to worn first-gear teeth or its mating cluster gear. In direct drive the gear is unloaded, so the noise vanishes. The load pattern isolates the first-gear set.

15. 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.

16. A — Coating the synchronizer cones and gears during assembly provides initial lubrication and prevents dry-start scoring before the oil circulates. The first rotations occur before splash lubrication reaches the parts. This pre-lube protects the new components.

17. D — A rattle at idle with the clutch engaged that stops when the pedal is depressed is normal neutral gear rattle excited by engine torsional pulses. Pressing the pedal disconnects the engine pulses from the gears, silencing the noise. This is a normal condition, not a failure.

18. B — The reverse idler gear is inserted between the countershaft and output gears to reverse the output shaft's rotation. Adding this extra gear changes the direction of rotation. It is what allows the vehicle to back up.

19. 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.

20. 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.

21. B — 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 under load. The worn balls and races click at high angles. Replacement of the joint or half shaft is required.

22. D — Final drive ratio is ring teeth divided by pinion teeth, so 65 ÷ 17 equals approximately 3.82:1. The pinion turns about 3.82 times for each ring gear revolution. This is the closest listed ratio.

23. 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.

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

25. B — 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.

26. D — Lubricant dripping where the half shaft enters the differential comes from the worn axle (output) shaft 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.

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

28. C — 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.

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

31. A — A vibration that begins near 50 mph and grows with speed, after balancing the tires, points next to the driveshaft for runout, worn U-joints, and overall balance condition. Driveshaft faults are speed-dependent and load-independent. Clutch and synchronizer items do not fit.

32. C — A center support bearing on a two-piece driveshaft supports the shaft at its midpoint to reduce vibration in longer driveshafts. The midpoint support raises the critical speed and steadies the assembly. It is unrelated to ratio, parking brake, or U-joints.

33. B — 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.

34. 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.

35. D — 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. B — A thicker pinion depth shim moves the pinion deeper into mesh with the ring gear. The shim sits behind the pinion and controls how far inward it sits. Backlash and preload adjustments are made elsewhere.

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

38. C — Limited-slip chatter on tight turns is first addressed by checking the gear oil condition and friction-modifier additive content. The additive lets the clutch plates slip smoothly instead of grabbing. Fresh, correct fluid usually cures the shudder.

39. A — Moving from 3.55:1 to 4.10:1 raises the numerical ratio, so engine rpm at cruise rises and low-speed acceleration improves. More torque multiplication trades highway efficiency for launch. The engine spins faster 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. C — 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. D — 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.

44. 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.

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

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

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