PRACTICE EXAM 24 — QUESTIONS 1–40

1. A bus overheats at road speed and slips slightly at cruise, but fluid level and condition are good and no internal clutch wear is found on later teardown. The BEST-supported root cause is:

A. A worn pump

B. Excessive ring and pinion backlash

C. A plugged axle breather

D. A torque converter not achieving lockup

2. A bus accelerates poorly from a stop with an above-spec stall reading, yet road-speed performance is normal. This combination BEST points to:

A. Slipping apply devices loading the converter only at launch

B. A non-locking converter at cruise

C. A worn wheel bearing

D. An out-of-phase driveshaft

3. Pressure testing shows low pressure in one clutch circuit only, and the related solenoid tested electrically good. The BEST-supported cause is:

A. A leak in that circuit, such as a worn piston seal

B. A worn pump

C. A faulty main regulator

D. A low overall fluid level

4. A transmission was overhauled correctly, road tests with poor shift quality, and live data shows the adaptives at default reset values that have not yet relearned. The BEST next action is to:

A. Re-disassemble the transmission

B. Complete the relearn drive cycle and re-evaluate

C. Replace the valve body

D. Replace the converter

5. A bus shows milky fluid, a dropping coolant level, and overheating. Considering all three clues, the BEST-supported cause is:

A. An out-of-phase driveshaft

B. An internally failed fluid-to-coolant cooler

C. A worn ring and pinion

D. An over-adjusted wheel bearing

6. A flare occurs only on the 2-3 shift, on-coming pressure reads low for that circuit only, and other shifts are normal. The BEST-supported cause is:

A. A worn pump affecting all circuits

B. High apply pressure

C. A non-locking converter

D. Low apply pressure or timing in the 2-3 on-coming circuit

7. A whine is present in neutral with the engine running, rises with engine RPM, and disappears when the engine is shut off while coasting. This BEST points to:

A. The pump or converter/input components

B. A wheel bearing

C. The differential side gears

D. The driveshaft center bearing

8. A bus stalls the engine when stopping in gear, but accelerates and cruises normally otherwise. The BEST-supported cause is:

A. A slipping clutch pack

B. A lockup clutch failing to release at low speed

C. A seized stator

D. A disconnected impeller

9. A retarder provides weak braking, scan data shows high fluid temperature, and the rotor is later found intact. The BEST-supported explanation is:

A. A mechanically failed retarder

B. TCM protective limiting due to heat

C. An out-of-phase driveshaft

D. An over-adjusted wheel bearing

10. A bus loses fluid with no external leak, the fluid is milky, and the cooler is integrated with the coolant. The BEST-supported conclusion is:

A. Fluid is migrating into the cooling system through a failed cooler

B. Fluid is lost past the U-joints

C. Fluid is lost out the breather

D. Fluid is lost through a loose pan bolt only

11. A solenoid tests within resistance spec, the circuit still fails to apply, and pressure testing of that circuit reads low. The BEST-supported cause is:

A. A failed TCM

B. A driveshaft phasing error

C. A stuck valve or hydraulic leak in that circuit

D. A worn wheel bearing

12. A bus is towed in with the engine seized, and the technician notes no transmission pressure during the tow. The BEST explanation is:

A. The valve body is stuck

B. The pump is engine-driven, so it makes no pressure with the engine off

C. The output speed sensor failed

D. The breather is plugged

13. A bus shows a harsh shift on every gear, fluid is good, no codes are set, and pressure reads above spec across circuits. The BEST-supported cause is:

A. An early off-going release

B. A non-locking converter

C. A plugged axle breather

D. A pressure regulation fault raising system pressure

14. A stall test reads well below spec, and the engine separately fails to make rated power on a road test. The BEST-supported cause of the low stall is:

A. Slipping clutches

B. An overfilled transmission

C. The engine not producing full power

D. A locked converter

15. A bus complaint of slipping and overheating is accompanied by a heavily restricted filter and otherwise normal components. The BEST-supported cause is:

A. The restricted filter starving the pump and lowering pressure

B. Excessive backlash

C. A driveshaft phasing error

D. A coolant leak

16. Live data on an aging bus shows maximum adaptive compensation and a worsening soft shift, with fluid level and condition confirmed good. The BEST-supported conclusion is:

A. A plugged breather

B. An out-of-balance driveshaft

C. Advancing internal clutch wear

D. A worn wheel seal

17. A bus shudders during lockup at steady speed, fluid condition is good, and the pinion preload and differential check normal. The BEST-supported focus is:

A. The drive axle pinion

B. The lockup clutch and its control circuit

C. The differential side gears

D. The slip yoke splines

18. A technician must decide whether to remove a transmission for a shift complaint that has not been narrowed. The BEST first action is to:

A. Remove the transmission

B. Replace the differential

C. Re-phase the driveshaft

D. Exhaust in-vehicle inspection and adjustment, then targeted testing

19. Two codes are present: an active clutch-circuit code and a stored speed-sensor code. The BEST diagnostic priority is to:

A. Diagnose the active clutch-circuit code first

B. Diagnose the stored speed-sensor code first

C. Clear both without diagnosis

D. Ignore both since the bus drives

20. A bus overheats only during heavy retarder use on long downgrades, with normal operation otherwise. The BEST first area to evaluate is:

A. Fluid level/condition and cooling system capacity

B. The driveshaft phasing

C. The ring and pinion backlash

D. The wheel seals

21. A bus shifts fine cold but slips when warm, fluid is at the correct level but dark and burnt. The BEST-supported interpretation is:

A. Normal operation

B. A driveshaft phasing error

C. An over-adjusted wheel bearing

D. Degraded fluid with likely clutch wear; find the heat source

22. Before mating a transmission to the engine, a technician is checking final items. The single most damaging error to avoid is:

A. An unbalanced driveshaft

B. An unadjusted wheel bearing

C. A converter not fully seated on the input components

D. A plugged axle breather

23. A vibration appears precisely at 50 mph regardless of gear and is absent at lower and higher speeds. The BEST-supported source is:

A. The transmission valve body

B. The torque converter stator

C. The driveshaft or drive axle

D. The lockup clutch solenoid

24. A driveshaft vibrates immediately after a U-joint replacement; runout, joints, and angles all check good. The BEST-supported cause is:

A. A worn wheel bearing

B. Excessive backlash

C. A slipping converter

D. The shaft reassembled out of phase

25. A two-piece driveshaft shows noise at a specific speed and measurable play at the mid-shaft support, with U-joints and runout good. The BEST-supported cause is:

A. Incorrect pinion depth

B. A worn center support bearing or its mount

C. A slipping converter

D. Low transmission fluid

26. A U-joint on a shaft with a near-zero working angle is found brinelled, while the joints on a correctly angled shaft are fine. The BEST explanation is:

A. Over-lubrication

B. Excessive angle

C. The near-zero angle prevented adequate bearing rotation

D. Reversed phasing

27. A bus axle is noisy on acceleration but quiet on coast, with lubricant and breather confirmed good. The BEST-supported source is:

A. The coast side of the ring and pinion

B. A wheel bearing

C. The drive side of the ring and pinion mesh

D. The differential spider gears

28. A bus axle is noisy only when cornering, with the ring and pinion mesh confirmed good. The BEST-supported source is:

A. The drive side of the ring and pinion

B. A straight-line wheel bearing

C. The lockup clutch

D. The differential side and spider gears

29. A contact pattern is biased toward the tooth flank/root while backlash measures correct. The BEST-supported conclusion is:

A. The backlash makes the pattern irrelevant

B. The pinion is too deep and needs shim correction

C. The adaptives need resetting

D. The cooler is restricted

30. An axle seal leak returns within days of a correct seal replacement, and the technician confirms the new seal was installed properly. The BEST-supported overlooked cause is:

A. Resetting the adaptives

B. Adjusting backlash

C. Replacing the driveshaft

D. A plugged housing breather building pressure

31. A technician setting pinion preload on a crush-sleeve axle wants to avoid ruining the sleeve. The correct method is to:

A. Tighten the nut as hard as possible

B. Set preload by feel

C. Skip preload if backlash is correct

D. Measure rotating torque to spec without over-crushing the sleeve

32. A wheel seal is leaking lubricant onto the brake assembly on a loaded transit bus. Considering passenger safety, the correct action is to:

A. Top off the lubricant and release the bus

B. Reset the adaptives

C. Correct the leak and inspect the brakes for contamination before release

D. Re-phase the driveshaft

33. A hypoid axle filled with a non-EP universal oil develops gear and bearing damage. The BEST explanation is:

A. The oil could not withstand the sliding tooth action under load

B. The oil lowered the operating temperature

C. The oil improved quietness

D. The oil locked the converter

34. A drive axle runs hot and the lubricant level reads low, with the breather clear. The BEST-supported consequence of the low level is:

A. Improved cooling

B. Overheating and accelerated gear and bearing wear

C. Higher line pressure

D. A re-phased driveshaft

35. A full-floating axle is inspected after a wheel-end failure. The technician confirms that, by design, vehicle weight is carried by:

A. The axle shaft

B. The differential

C. The wheel bearings on the housing

D. The slip yoke

36. A drive axle produces steady noise on both acceleration and coast, with the differential and wheel bearings checking good. The BEST-supported cause is:

A. Worn ring and pinion or incorrect setup

B. The differential spider gears

C. A single wheel bearing

D. The slip yoke

37. A cyclic noise rises and falls with wheel speed, is louder on one side, and is unaffected by drive or coast. The BEST-supported source is:

A. The drive side of the ring and pinion

B. The coast side of the ring and pinion

C. The differential side gears

D. A wheel bearing or axle shaft at that wheel end

38. During final-drive setup, backlash is correct but the pattern is biased toward the tooth top/face. The BEST-supported conclusion is:

A. The pinion is too deep

B. The pinion is too shallow and needs shim correction

C. The adaptives need resetting

D. The cooler is restricted

39. A drive axle lubricant sample contains visible metal particles, with the breather clear and the level correct. The BEST-supported conclusion is:

A. Internal gear or bearing wear

B. Normal operation

C. A coolant leak

D. A driveshaft phasing error

40. A vibration tracks engine speed rather than road speed and is present in neutral with the engine running. The BEST-supported source is:

A. The drive axle

B. The differential side gears

C. The engine, converter, or input components

D. A wheel bearing

Answer Key & Full Answer Explanations

1. D — Road-speed overheating with cruise slip, good fluid, and no internal clutch wear found points to a torque converter not achieving lockup, since continuous slip generates heat and a slip sensation. A worn pump, backlash, and the breather are unrelated. The teardown ruling out clutch wear confirms lockup as the cause.

2. A — Poor launch with above-spec stall but normal road-speed performance points to slipping apply devices loading the converter only at launch. A non-locking converter affects cruise, and a wheel bearing or phasing error are unrelated. The launch-only pattern with high stall indicates apply-device slip under launch load.

3. A — Low pressure in one circuit only, with the solenoid electrically good, points to a leak in that circuit, such as a worn piston seal. A worn pump, faulty regulator, or low fluid would lower pressure system-wide. The single-circuit pattern isolates the fault.

4. B — A correctly overhauled transmission with adaptives at default reset values that have not relearned needs the relearn drive cycle completed and re-evaluation. Re-disassembly, valve body replacement, or converter replacement are premature. The adaptives must relearn before judging shift quality.

5. B — Milky fluid, dropping coolant, and overheating together point to an internally failed fluid-to-coolant cooler allowing the fluids to mix. A phasing error, worn ring and pinion, or over-adjusted bearing would not mix coolant and fluid. The shared cooler is the path.

6. D — A flare confined to the 2-3 shift with low on-coming pressure for that circuit only points to low apply pressure or timing in the 2-3 on-coming circuit. A worn pump affects all circuits, high pressure causes harshness, and the converter is unrelated. The single-circuit flare isolates that on-coming clutch.

7. A — A whine in neutral that rises with engine RPM and disappears when the engine stops points to the pump or converter/input components, which turn with the engine. A wheel bearing, side gears, and the center bearing track road or shaft speed. The engine-speed relationship localizes it upstream.

8. B — Stalling the engine only when stopping in gear, with otherwise normal operation, points to a lockup clutch failing to release at low speed. A slipping clutch, seized stator, or disconnected impeller would affect drive differently. A stuck-applied lockup clutch stalls the engine at low speed.

9. B — Weak retarding with high fluid temperature and an intact rotor points to TCM protective limiting due to heat. A mechanical failure is ruled out by the intact rotor, and a phasing error or bearing are unrelated. Protective limiting is mistaken for failure.

10. A — Fluid loss with no external leak, milky color, and a coolant-integrated cooler points to fluid migrating into the cooling system through a failed cooler. The U-joints, breather, and a pan bolt would not produce milky fluid. The cooler is the migration path.

11. C — A solenoid within resistance spec, a non-applying circuit, and low circuit pressure together point to a stuck valve or hydraulic leak in that circuit. A failed TCM, phasing error, or wheel bearing are unrelated. The pressure test confirms the hydraulic fault.

12. B — No transmission pressure during a tow with a seized engine is explained by the pump being engine-driven, so it makes no pressure with the engine off. A valve body, speed sensor, or breather fault would not eliminate all pressure. Engine-off means no pump flow.

13. D — A harsh shift on every gear with good fluid, no codes, and above-spec pressure across circuits points to a pressure regulation fault raising system pressure. An early off-going release causes flare, and the converter and breather are unrelated. System-wide high pressure implicates regulation.

14. C — A well-below-spec stall with the engine separately failing to make rated power points to the engine not producing full power as the cause of the low stall. Slipping clutches raise stall, and the other options do not lower it. Low stall plus low engine power confirms the engine.

15. A — Slipping and overheating with a heavily restricted filter and otherwise normal components points to the restricted filter starving the pump and lowering pressure. Backlash, phasing, and a coolant leak are unrelated. A clogged filter mimics internal faults.

16. C — Maximum adaptive compensation with a worsening soft shift and good fluid points to advancing internal clutch wear. A plugged breather, out-of-balance driveshaft, or worn wheel seal are unrelated. Extreme adaptives signal internal wear.

17. B — Shudder during lockup at steady speed with good fluid and normal pinion/differential points to the lockup clutch and its control circuit. The pinion, side gears, and slip yoke splines are ruled out. Shudder localized to lockup directs diagnosis there.

18. D — For an un-narrowed shift complaint, the best first action is to exhaust in-vehicle inspection and adjustment, then targeted testing. Removing the transmission, replacing the differential, or re-phasing are premature. Diagnosis earns the teardown.

19. A — With an active clutch-circuit code and a stored speed-sensor code, the active code is diagnosed first because the fault is present now. The stored code may be intermittent, and clearing or ignoring both abandons diagnosis. Active faults take priority.

20. A — Overheating only during heavy retarder use on downgrades should first prompt evaluation of fluid level/condition and cooling system capacity, since the retarder shares that system. Driveshaft phasing, backlash, and wheel seals are unrelated to retarder heat. Fluid and cooling come first.

21. D — Slipping when warm with correct-level but dark, burnt fluid points to degraded fluid with likely clutch wear, and the heat source must be found. It is not normal, a phasing error, or a bearing issue. Address the cause of the heat.

22. C — The single most damaging pre-mating error to avoid is a converter not fully seated on the input components, which destroys the pump on start-up. An unbalanced driveshaft, unadjusted bearing, or plugged breather are unrelated to mating. Full seating must be verified.

23. C — A vibration precisely at 50 mph regardless of gear, absent above and below, points to the driveshaft or drive axle. The valve body, stator, and lockup solenoid are transmission components. Speed-related, gear-independent vibration is a downstream signature.

24. D — Vibration immediately after a U-joint replacement, with runout, joints, and angles good, points to the shaft reassembled out of phase. A wheel bearing, backlash, or slipping converter would not appear specifically after that service. Restoring correct phase is the fix.

25. B — Noise at a specific speed with measurable mid-shaft play, and U-joints and runout good, points to a worn center support bearing or its mount. Pinion depth, a slipping converter, and low fluid are unrelated to a mid-shaft fault. The location of the play identifies the component.

26. C — A brinelled joint on a near-zero-angle shaft, while correctly angled shafts are fine, is explained by the near-zero angle preventing adequate bearing rotation. Over-lubrication, excessive angle, and reversed phasing are not the cause. Too little angle dents the bearings.

27. C — Noise on acceleration but quiet on coast, with lubricant and breather good, points to the drive side of the ring and pinion mesh, loaded under power. The coast side loads on deceleration, a wheel bearing gives cyclic noise, and the spider gears act on turns. Drive-versus-coast isolates the loaded side.

28. D — Noise only when cornering, with the ring and pinion mesh good, points to the differential side and spider gears, which rotate relative to each other only in turns. The drive side, a straight-line wheel bearing, and the lockup clutch are not turn-specific. Turn-only noise isolates the differential internals.

29. B — A pattern biased toward the flank/root with correct backlash indicates the pinion is too deep and needs shim correction. Correct backlash does not make the pattern irrelevant, and adaptives and the cooler are unrelated. The pattern reveals the depth error.

30. D — A seal leak returning within days of a correct replacement points to a plugged housing breather building pressure that forces lubricant past the new seal. Resetting adaptives, adjusting backlash, or replacing the driveshaft are unrelated. The breather must be checked.

31. D — On a crush-sleeve axle, pinion preload is set by measuring rotating torque to spec without over-crushing the sleeve. Tightening as hard as possible ruins the sleeve, feel is inaccurate, and skipping it is wrong. Measured preload prevents looseness and overload.

32. C — A seal leaking onto the brake assembly on a loaded bus requires correcting the leak and inspecting the brakes for contamination before release, since contaminated linings reduce braking. Topping off, resetting adaptives, or re-phasing ignore the safety hazard. Brake contamination is urgent.

33. A — A hypoid axle filled with non-EP universal oil suffers gear and bearing damage because the oil could not withstand the sliding tooth action under load. It did not lower temperature, improve quietness, or lock the converter. EP lubricant is mandatory.

34. B — A hot axle with low lubricant and a clear breather points to overheating and accelerated gear and bearing wear from the low level. It does not improve cooling, raise line pressure, or re-phase the driveshaft. Correct level is essential to durability.

35. C — On a full-floating axle, vehicle weight is carried by the wheel bearings on the housing while the shaft transmits torque. The axle shaft, differential, and slip yoke do not carry the weight. Load and torque follow separate paths.

36. A — Steady noise on both acceleration and coast, with the differential and wheel bearings good, points to worn ring and pinion or incorrect setup. The spider gears act on turns, a single wheel bearing gives one-sided cyclic noise, and the slip yoke is unrelated. Noise on both sides indicates broad mesh wear or setup error.

37. D — A cyclic noise that rises and falls with wheel speed, is louder on one side, and is unaffected by drive or coast points to a wheel bearing or axle shaft at that wheel end. Ring-and-pinion noise is drive/coast dependent, and the side gears act on turns. The wheel-speed-cyclic, one-sided, load-independent pattern localizes to that wheel end.

38. B — A pattern biased toward the top/face with correct backlash indicates the pinion is too shallow and needs shim correction. It is not too deep, and adaptives and the cooler are unrelated. The pattern location reveals the depth error.

39. A — Visible metal particles in axle lubricant, with the breather clear and level correct, point to internal gear or bearing wear. It is not normal, a coolant leak, or a phasing error. Metal contamination warns of internal damage.

40. C — Vibration that tracks engine speed rather than road speed and is present in neutral points to the engine, converter, or input components, which turn with the engine. The drive axle, side gears, and wheel bearings track road or shaft speed. The engine-speed relationship localizes it upstream.

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