PRACTICE EXAM 11: ASE A5 BRAKES SIMULATION

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Time Allowed: 90 Minutes **Total Questions:** 45 **Passing Score:** Approximately 70% (32/45) **Format:** Multiple Choice — Select the BEST answer

EXAM INSTRUCTIONS: Read each question carefully. Select the single best answer. Manage your time — approximately 2 minutes per question. Do not leave any question unanswered.

1. A customer reports the vehicle takes much longer than normal to stop. During inspection the technician finds the brake pedal is firm and does not sink under sustained pressure. All four brake pads are within specification. The MOST likely cause is:

A. Contaminated brake pads that cannot generate adequate friction despite normal hydraulic pressure

B. Air in the hydraulic system reducing pressure output at the calipers

C. A failing master cylinder that is bypassing internally under hard application

D. A stuck metering valve holding off front brake pressure during normal stops

2. A technician is diagnosing a hard brake pedal complaint on a vehicle with a vacuum booster. To isolate whether the hydraulic system is functioning correctly, the technician disconnects the vacuum supply hose to the booster and plugs it. With no vacuum assist, the technician applies firm pedal pressure. The vehicle stops adequately with increased pedal effort. This result confirms:

A. The booster diaphragm has failed and must be replaced

B. The hydraulic brake system is functioning normally and the fault is isolated to the power assist circuit

C. The master cylinder pushrod is adjusted incorrectly and must be lengthened

D. The brake pads are glazed and require replacement before further booster diagnosis

3. A vehicle with a Hydro-Boost power brake system had its power steering pump replaced due to a bearing failure. After the pump replacement and system bleeding, the customer reports the brake pedal becomes hard after two applications with the engine off. The NEXT step the technician should perform is:

A. Replace the Hydro-Boost unit since it lost pressure reserve during the pump failure event

B. Test the Hydro-Boost accumulator charge by pumping the pedal several times after engine shutdown to verify at least two to three power-assisted applications remain

C. Bench bleed the master cylinder since air entered during the pump replacement procedure

D. Check the power steering fluid level since insufficient fluid prevents Hydro-Boost operation

4. A vehicle with rear drum brakes was repaired at another shop where the rear wheel cylinders were replaced with units that have a larger bore diameter than the originals. The customer now reports the rear brakes lock up during moderate stops. The MOST likely cause is:

A. The larger bore wheel cylinders are generating less force than the originals due to reduced piston contact area

B. The larger bore wheel cylinders are generating more shoe application force than the brake system was designed for, creating rear brake bias toward lockup

C. The new wheel cylinders have a residual pressure check valve that is trapping excess pressure in the rear circuit

D. The rear drum brake self-adjusters are not compatible with the new wheel cylinder bore size

5. A vehicle pulls to the left during braking after the driver splashes through a large roadside puddle. The pull appears immediately after the puddle and disappears after several stops. The MOST likely cause is:

A. Water entered the left front wheel bearing causing it to bind during brake application

B. Water contact with the right front brake pad temporarily reduced its friction, causing the higher-friction left front to pull the vehicle left until the water evaporated

C. Water was drawn into the left front brake line through a pinhole, introducing air into the circuit

D. The left front caliper piston seal absorbed water and swelled, increasing left front clamping force

6. A customer reports a rhythmic knocking noise from the right rear during brake application that occurs once per wheel revolution. The noise is present at all speeds but is most noticeable at low speed. Brake hardware, return springs, and wheel cylinder are all within specification. The MOST likely cause is:

A. A loose right rear wheel cylinder bolt allowing the cylinder to rock during application

B. A drum interior flat spot or localized high spot creating one impact per revolution as the shoe contacts the irregularity

C. A broken right rear brake shoe that is contacting the backing plate during application

D. A right rear wheel bearing with a damaged roller creating one click per revolution

7. A vehicle is towed in after the customer accidentally drove several miles with the parking brake partially engaged. Both rear drums are discolored blue from heat. The brake shoes have a glazed, shiny appearance. The wheel cylinders have not been inspected yet. The correct repair procedure includes:

A. Resurface the drums, replace the shoes, and return to service after verifying wheel cylinder function

B. Replace drums and shoes, inspect wheel cylinders for heat damage, and identify and correct the root cause of the parking brake engagement

C. Replace only the brake shoes and adjust the parking brake cable to prevent recurrence

D. Replace all rear brake components including the wheel cylinders, drums, shoes, and hardware without inspection

8. A customer reports that after a complete rear drum brake service performed yesterday, the brake pedal feels slightly lower than normal on the first application this morning. After that first application the pedal returns to normal height and feels fine for the rest of the day. The MOST likely cause is:

A. Air was introduced into the rear brake circuit during the service that is purging itself on the first application each day

B. The brake shoes settled slightly away from the drums overnight due to thermal contraction, requiring the first pedal stroke to take up the additional clearance

C. The rear wheel cylinder pistons are retracting too far due to new cup seals that have not yet seated properly

D. The self-adjusters were not set during the service and require one pedal application to advance before normal operation

9. After replacing a leaking rear axle seal, a technician finds an ABS DTC for the right rear wheel speed sensor — signal erratic. The technician inspects the sensor and tone ring visually and finds them undamaged. The technician measures sensor resistance and it is within specification. The NEXT step is:

A. Replace the wheel speed sensor since all other components have been ruled out

B. Clean the tone ring thoroughly of any gear oil contamination and verify signal accuracy with live scan tool data before clearing the DTC

C. Replace the ABS control module since it is misinterpreting a clean sensor signal

D. Inspect the rear axle bearing for wear since bearing play causes tone ring runout that produces erratic signals

10. A customer reports that when accelerating hard from a stop, the brake pedal feels slightly stiff for the first application immediately after the hard acceleration. After that first application pedal feel returns to normal. The booster and master cylinder both test within specification. The MOST likely explanation is:

A. The master cylinder primary cup seal is momentarily sticking against the bore during acceleration before freeing up on the first pedal application

B. Engine intake manifold vacuum drops during hard throttle application — the booster check valve retains stored vacuum and restores normal assist on the first brake application after acceleration

C. The brake booster diaphragm distorts slightly under engine torque vibration during hard acceleration

D. Fuel vapor entering the intake manifold during hard acceleration temporarily contaminates the vacuum supply to the booste

11. A vehicle has a twin-piston floating caliper on the left front with one piston that has seized in its bore. The technician applies the brakes and observes caliper function. Which symptom will this condition MOST likely produce?

A. Complete loss of left front braking since neither piston can apply force when one is seized

B. Normal braking with slight noise since the floating caliper design compensates for one seized piston

C. Reduced clamping force and tapered pad wear across the pad width since force is applied unevenly

D. Brake pull to the right since the left front caliper generates less than normal clamping force

12. A customer with a front-wheel-drive vehicle reports that the traction control warning light never activates when accelerating on wet pavement, even when the front wheels are clearly spinning. A scan tool shows no fault codes and all four wheel speed sensors are reading correctly. The MOST likely cause is:

A. The TCS system has been accidentally disabled through the vehicle menu settings

B. The amount of wheelspin the customer is generating is below the TCS intervention threshold — the system is correctly not activating

C. The TCS solenoid valve in the ABS modulator is stuck and cannot apply brake pressure to the spinning wheels

D. The TCS throttle reduction function has failed while the brake application function remains operational

13. A technician has diagnosed an ABS system fault. After verifying that all four wheel speed sensors, all solenoid valve circuits, the pump motor circuit, and all power supply and ground circuits are functioning correctly, the scan tool still shows a DTC for ABS control module internal fault. The correct repair is:

A. Perform a complete ABS system flush and bleed since contaminated fluid can cause module processing errors

B. Replace the ABS control module since all external components have been verified and the fault is isolated to the module's internal circuitry

C. Clear the DTC and perform an extended road test since internal module codes are often false positives

D. Inspect the CAN bus wiring since communication errors can appear as internal module faults

14. A customer in a cold climate reports that on very cold mornings, the electric parking brake will not release. The EPB motor runs when the release is commanded but the parking brake remains engaged. No DTCs are stored. The MOST likely cause is:

A. The EPB control module loses its calibration in extreme cold and requires a warm-up period before release is possible

B. Moisture trapped between the caliper piston face and the brake pad backing plate has frozen solid, and the EPB motor cannot generate enough force to overcome the ice bond

C. The EPB actuator gear lubricant has thickened in the cold, preventing the motor from reaching sufficient torque to retract the piston

D. The EPB system has a cold-weather protection mode that prevents release until the vehicle has warmed to operating temperature

15. A customer reports that when accelerating from a stop, the vehicle briefly hesitates, individual brakes seem to apply momentarily, and the ESC warning light flashes. This occurs regularly during normal acceleration on dry pavement. No DTCs are stored. The technician should explain to the customer that:

A. The ESC system has a calibration fault that requires a steering angle sensor reset procedure

B. The traction control function within the ESC suite is activating normally during wheel spin — this is correct system operation and not a malfunction

C. A wheel speed sensor is producing an intermittent dropout that the ESC module is interpreting as wheel spin

D. The ABS modulator has a sticky solenoid that applies randomly during acceleration events

16. A vehicle was involved in a minor collision that bent the left rear lower control arm. The control arm was replaced and a four-wheel alignment was performed. Two days later the customer returns with an ABS warning light. A scan tool shows an intermittent left rear wheel speed sensor fault that occurs only during braking from highway speed. All sensor and wiring tests are normal. The MOST likely cause is:

A. The alignment change after control arm replacement altered the left rear wheel's effective rolling radius, causing its speed sensor to report a different speed than the other three wheels during hard braking

B. The tone ring was damaged during the control arm replacement and has a hairline crack that only opens under high-speed braking loads

C. The new control arm has a slightly different geometry that causes the left rear wheel to lock momentarily during hard braking before ABS can respond

D. The ABS control module lost its calibration memory during the battery disconnect required for the collision repair

17. A technician discovers that a vehicle's brake system has been topped off with DOT 5 silicone fluid by a previous owner. The remainder of the system contains DOT 3 glycol-based fluid. The correct service procedure is:

A. Add a chemical dispersant to the reservoir to mix the two fluids and then flush the combined mixture from the system

B. Flush the entire brake system thoroughly, inspect all rubber components for compatibility damage, and refill with the correct specified fluid

C. Continue using DOT 5 since it has a higher boiling point than DOT 3 and is compatible when used in small quantities

D. Replace only the master cylinder since it is the primary location where the two fluids have mixed

18. During a routine brake inspection, a technician notices that the front brake calipers show dark rust staining along the outer edges of the brake pads where they extend slightly beyond the rotor friction surface. The rear calipers show no similar staining. The MOST likely explanation is:

A. The front calipers are misaligned outward, causing the pad edges to overhang the rotor and accumulate rust staining from road moisture

B. The front brakes generate significantly more heat than the rear brakes, causing more rapid thermal cycling and wet-dry cycling at the pad edges that creates the rust staining pattern

C. The front brake pads are oversized for this application and their edge overhang is collecting road debris

D. The front rotor friction surface diameter is smaller than designed, causing the pads to overhang the outer rotor edge

19. A customer reports a squeal from the rear brakes during engine braking on downhill grades. The squeal disappears immediately when the brake pedal is intentionally applied. All rear brake hardware, springs, and wheel cylinder function are within specification. The MOST likely cause is:

A. The rear brake shoe return springs are too weak and cannot fully retract the shoes during engine braking

B. The rear drum surfaces are glazed and produce noise only under the light contact of engine braking deceleration

C. The brake shoes are shifting during engine braking and contacting the drum anchor pins, generating squeal that stops when pedal application seats the shoes firmly in their correct position

D. Engine braking creates a brief reverse pressure pulse in the hydraulic system that lightly applies the rear brakes

20. After performing a complete ABS brake system service including pressure bleeding all four corners, a customer returns one week later stating the brake pedal became spongy immediately after the ABS activated during an emergency stop. Before the ABS event the pedal felt completely normal. The MOST likely cause is:

A. The emergency stop overheated the brake fluid, introducing vapor bubbles that remained in the system after the stop

B. The emergency stop damaged one of the ABS solenoid valves, causing it to leak internally after activation

C. Air trapped in the HCU passages during the previous bleed procedure was released into the main brake circuits during the first ABS activation event

D. The emergency stop distorted one of the front rotors, causing piston retraction that introduced air at that corner

21. A customer reports that every morning when they begin driving, there is a brief clicking noise from under the hood and a slight pulse through the brake pedal during the first slow-speed movement of the vehicle. The brakes function normally otherwise and no warning lights are on. The MOST likely cause is:

A. The ABS pump motor is priming the hydraulic accumulator during the initial startup sequence

B. The ABS/ESC system is performing its daily solenoid self-test during first vehicle movement, producing clicking from solenoid actuations and a brief pedal pulse

C. Air is migrating into the brake circuit overnight and being expelled during the first pedal application

D. The master cylinder compensating ports are clearing overnight debris with the first hydraulic pulse of the day

22. A technician is performing a front brake pad and rotor replacement. The new rotors are confirmed correct by part number. After mounting the rotor and attempting to install the brake caliper with new pads, the caliper will not slide over the rotor even with the piston fully compressed. The MOST likely cause is:

A. The caliper slide pins are binding and preventing the caliper from opening to its full width

B. The new brake pads are thicker than OEM specification and cannot fit within the caliper opening

C. The new replacement rotor is thicker than the worn original it is replacing, and the combined stack height of new rotor plus new pad exceeds the caliper bridge opening

D. The caliper piston was not fully retracted and residual pressure is holding it partially extended

23. A vehicle consistently pulls slightly to the right during the first brake application after sitting in direct sunlight on a hot day. After two or three brake applications the pull disappears completely. The same vehicle shows no pull during braking on cool or overcast days. The MOST likely cause is:

A. The right front rotor expands more than the left in direct sunlight due to a difference in rotor thickness

B. The right front brake hose softens in direct heat, causing it to balloon and reduce right front clamping force

C. The left front caliper piston seal has partially swollen from petroleum contamination, and solar heat causes it to extend the piston slightly — pre-loading the left front pad and causing an initial pull toward that side

D. Direct sunlight heats the right front caliper body, causing thermal expansion that reduces its clearance and creates momentary right front brake drag

24. During a brake inspection, a technician notices a white crystalline deposit on the exterior of the right front caliper body near the bleeder screw. The brake fluid level is normal and there is no evidence of fluid leakage at the caliper. The MOST likely explanation is:

A. Calcium deposits from hard water used in a recent pressure wash of the vehicle

B. Road salt residue from winter driving that has dried on the caliper surface — a cosmetic finding with no brake system significance

C. Brake fluid that seeped from the bleeder screw during a previous bleed and crystallized on the caliper surface

D. Mineral deposits from condensation that forms on the cold caliper surface during humid summer nights

25. A technician replaces a leaking rear brake line on a vehicle. After completing the repair and bleeding the system, the brake warning light remains on. The technician confirms the rear circuit pressure is equal to the front circuit pressure using a brake pressure gauge. The MOST likely reason the warning light is still on is:

A. The pressure differential switch has an internal fault and must be replaced

B. The brake fluid level dropped enough during the repair to trigger the reservoir level sensor

C. The pressure differential valve spool was displaced toward the repaired rear circuit during the leak event and can often be recentered by applying firm pedal pressure with both circuits intact

D. The warning light circuit requires a scan tool reset procedure to extinguish after a brake circuit fault event

26. A technician is diagnosing an active Hall effect wheel speed sensor fault. The reference voltage measured at the signal wire at the sensor connector reads 0.3 volts instead of the expected 5 volts. The resistance measured directly across the sensor terminals is within the manufacturer's specification. The MOST likely cause is:

A. The ABS control module has failed and is no longer supplying the correct 5-volt reference voltage to any of the four sensors

B. The signal wire has a short to ground somewhere along its length between the module and the sensor, pulling the reference voltage down toward ground potential

C. The sensor has an internal partial short circuit that is loading down the reference voltage without affecting terminal resistance

D. The sensor connector has excessive resistance from corrosion, creating a voltage drop before the reference reaches the sensor terminal

27. A customer with a vehicle driven in a cold northern climate reports that on very cold mornings the brake pedal feels slightly lower than normal and requires a longer stroke before braking begins. After the vehicle warms up, the pedal returns to its normal height and feel. No codes are stored and no leaks are found. The MOST likely cause is:

A. Brake fluid moisture absorption is causing temporary fluid thickening in cold temperatures

B. The rear drum brake shoes contract slightly in cold weather, increasing shoe-to-drum clearance until the drums warm up

C. The master cylinder pushrod contracts slightly in cold weather, creating additional free play that increases pedal travel before hydraulic pressure builds

D. The vacuum booster diaphragm stiffens in cold temperatures, requiring more pedal travel before it deflects sufficiently to provide assist

28. A vehicle with a rear drum and front disc brake system was recently serviced with a new combination valve installed. After the service, the customer reports the rear wheels lock up during every moderate-to-hard stop. Before the service, braking was normal. All other components are confirmed correct. The MOST likely cause is:

A. The replacement combination valve has a higher proportioning split point than the original, reducing rear circuit pressure too early

B. The new combination valve was installed incorrectly — reversed in orientation — causing it to limit front circuit pressure instead of rear circuit pressure

C. The replacement combination valve has a failed metering valve section that is allowing full pressure to both circuits simultaneously

D. The new combination valve pressure differential switch is stuck open, reducing overall rear circuit pressure during hard stops

29. A technician scans a vehicle that a customer brought in with an ABS warning light complaint. The scan tool retrieves a stored DTC for the left front wheel speed sensor that was set three weeks ago. The DTC is not active. All four wheel speed sensors produce clean, accurate signals on live data during a road test. After clearing the code, the light does not return during a 20-minute road test. The correct service recommendation is:

A. Replace the left front wheel speed sensor since a stored fault in that sensor circuit confirms it is failing

B. Replace the left front tone ring since stored codes for that sensor indicate intermittent mechanical signal loss

C. Clear the code and return the vehicle — a historical DTC that does not return after thorough testing most likely represents a resolved transient event and does not justify sensor replacement

D. Replace the ABS control module since recurring DTCs that clear between drive cycles indicate module memory corruption

30. A technician is inspecting a dual-compartment master cylinder reservoir. The front compartment is full and the rear compartment is approximately half full. No external leaks are found anywhere in the brake system. The brake pedal feels normal. The MOST likely explanation for the unequal fluid levels is:

A. The rear caliper pistons have extended as the rear disc brake pads have worn, consuming fluid from the rear circuit reservoir compartment

B. A slow internal leak in the rear master cylinder piston seal is gradually transferring fluid from the rear compartment to the front compartment

C. The reservoir cap vent is partially blocked, creating a slight vacuum in the rear compartment that draws fluid inward

D. The pressure differential switch has shifted toward the rear circuit, diverting a small amount of rear circuit fluid into an internal passage

31. A technician discovers during a caliper slide pin service that the previous technician used petroleum-based chassis grease on the slide pins instead of the specified synthetic caliper grease. The rubber boots and caps on both slide pins are visibly swollen. The correct repair procedure is:

A. Wipe off the excess petroleum grease, reinstall the boots, and apply the correct grease on top of any remaining contamination

B. Remove the slide pins, clean all petroleum contamination from the pins and bores, replace the swollen boots and caps, and apply the correct synthetic caliper grease before reassembly

C. Replace the entire caliper assembly since petroleum contamination of the slide pins cannot be fully remediated

D. Soak the boots in brake cleaner to remove petroleum contamination and reinstall them once they have returned to normal size

32. A vehicle with rear drum brakes has a parking brake that holds correctly on the left rear but provides no resistance on the right rear regardless of how far the lever is pulled. The right rear service brake functions normally. When a helper pulls the parking brake lever, the technician observes that there is no tension in the right rear parking brake cable. The MOST likely cause is:

A. The right rear parking brake lever inside the drum has broken off the brake shoe

B. The right rear parking brake cable has broken and is transmitting no force to the right rear shoe

C. The right rear wheel cylinder is bypassing internally, preventing the parking brake from holding

D. The right rear brake shoe anchor pin has sheared, preventing the shoe from expanding

33. A technician is inspecting a master cylinder reservoir and notices that when the reservoir cap is removed, the fluid level in the rear compartment immediately rises to the level of the front compartment. Both compartments were at different levels before the cap was removed. The MOST likely cause is:

A. The internal divider between the two reservoir compartments has cracked, allowing fluid to communicate between circuits and eliminating the dual-circuit safety function

B. Removing the cap released a partial vacuum in the rear compartment, drawing fluid from the front compartment through the master cylinder bore

C. The rear circuit has a slow leak that was compensated by the pressure relief function of the reservoir divider

D. Temperature equalization after cap removal causes fluid to redistribute between compartments due to density differences

34. A vehicle has an ABS warning light. The scan tool retrieves a DTC for ABS control module power supply fault. The technician inspects all four wheel speed sensors, all solenoid valve circuits, and the pump motor — all test within specification. The NEXT step is:

A. Replace the ABS control module since all external components are confirmed normal

B. Check the ABS module fuse and the ignition-switched power feed wiring between the fuse box and the module connector

C. Perform a complete ABS brake bleed since air in the system can generate false power supply codes

D. Inspect the ABS pump motor relay since a failed relay produces a power supply fault code without affecting solenoid circuits

35. A vehicle was stored in an unheated garage for two weeks during cold weather. The owner reports that on the first drive after storage, the brake pedal went to the floor on the very first application before recovering to normal height on the second application. All subsequent brake applications throughout the drive felt completely normal. No warning lights came on. The MOST likely cause is:

A. Brake fluid moisture froze in the lines during storage and temporarily blocked fluid flow on the first application

B. The rear drum brake shoes settled slightly away from the drum during two weeks of cold storage — the first pedal stroke took up the additional clearance before normal braking resumed

C. Condensation formed inside the master cylinder bore during storage and created a momentary hydraulic gap on the first application

D. The vacuum booster diaphragm stiffened during cold storage and temporarily prevented the master cylinder piston from traveling its full stroke

36. A vehicle has a rear axle seal leak on the right rear. After confirming the leak, the technician inspects the right rear drum brake and finds the brake shoe lining is soaked with gear oil. The correct repair procedure is:

A. Clean the shoe lining with brake cleaner, resurface the drum, replace the axle seal, and return to service

B. Replace the right rear axle seal, replace both rear brake shoes as a matched set, clean and inspect the drum, and inspect the wheel cylinder for oil contamination

C. Replace only the right rear shoe, replace the axle seal, and adjust the rear brakes

D. Replace the axle seal and allow the existing shoe to self-clean through normal brake heating during the first several drives

37. A customer reports that after driving for 45 minutes on the highway, the brake pedal feels slightly firmer and sits slightly higher than it did at the start of the trip. After parking overnight, the pedal returns to its normal height and feel in the morning. No drag is felt during driving and no warning lights are on. The MOST likely cause is:

A. Brake fluid is expanding thermally in the master cylinder reservoir, pressurizing the system slightly during extended driving

B. The brake booster check valve is trapping progressively more vacuum during extended driving, increasing assist and raising the pedal

C. Thermal expansion of brake components during extended driving progressively reduces running clearance, causing the pedal to build pressure at a slightly higher position as components expand

D. The master cylinder compensating ports are partially blocked with debris that clears overnight when the system is cold

38. A technician performs a brake burnish procedure after a complete front brake job. Immediately after the burnish, the technician measures rotor surface temperature with an infrared thermometer. The left front rotor reads 280°F and the right front rotor reads 185°F. All other findings are normal. The MOST likely cause of the temperature difference is:

A. The left front brake hose is partially collapsed, trapping pressure and over-applying the left front caliper during the burnish procedure

B. The left front caliper slide pins are binding, preventing the caliper from fully releasing after each burnish stop and causing the left front rotor to run hotter from continuous drag

C. The left front brake pads have a higher friction coefficient than the right due to an incorrect part being installed on that side

D. The left front rotor is thinner than the right due to previous machining and retains heat more readily after the same braking input

39. A technician installs a new brake booster and master cylinder assembly on a vehicle. After installation and bleeding, the brake pedal is very firm and sits much higher than normal. The vehicle pulls slightly forward when the transmission is placed in gear with the foot off the brake pedal. The MOST likely cause is:

A. Air is trapped in the master cylinder bore from an incomplete bench bleed procedure

B. The new master cylinder has a smaller bore diameter than the original, generating higher than normal hydraulic pressure

C. The brake booster is generating excessive vacuum assist due to a high-flow check valve installed in the vacuum line

D. The master cylinder pushrod length was not adjusted after installation and is too long — pre-loading the master cylinder piston and partially blocking the compensating port

40. A vehicle has both ABS and TCS. A scan tool test of the ABS modulator shows all ABS solenoid valve circuits are functioning correctly. However, a separate test of the TCS-specific solenoid valve circuit shows an open circuit fault. The MOST likely outcome of this fault is:

A. Both ABS and TCS are disabled since they share solenoid valve circuits in the modulator

B. ABS function is preserved but the TCS brake intervention function is disabled since the two systems use distinct solenoid valve circuits

C. TCS is preserved through engine throttle reduction alone but ABS is degraded since TCS solenoids assist ABS pressure modulation

D. The entire ABS modulator must be replaced since individual solenoid circuit faults require complete unit replacement

41. A vehicle has a fixed opposed-piston front caliper. After a brake pad replacement, the technician notices the outboard pad is wearing significantly faster than the inboard pad. Technician A says the caliper is floating on its mounting and the outboard pin is seized. Technician B says the inboard piston is not generating its full designed clamping force. 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

42. A vehicle equipped with Hill Start Assist (HSA) was recently serviced with a complete rear brake bleed. After the service, the customer reports the vehicle rolls backward briefly on inclines when releasing the brake before engaging the throttle — the HSA is not holding. Before the service, HSA functioned correctly. The MOST likely cause is:

A. The HSA control module lost its calibration during the brake bleed and requires a relearn procedure

B. Air trapped in the rear brake circuit from the bleed procedure prevents the HSA system from building adequate holding pressure when commanded

C. The rear brake pads were disturbed during the bleed service and require a bed-in procedure before HSA can function correctly

D. The HSA system requires a scan tool reset after any brake system service before it will reactivate

43. A vehicle is brought in for a routine brake inspection. The technician notices the ABS and ESC warning lights are both illuminated. The customer mentions that the front bumper cover was recently replaced at a body shop. No mechanical brake components were disturbed during the bumper replacement. A scan tool shows an AEB (Automatic Emergency Braking) system fault and the front radar sensor is reporting no signal. The MOST likely explanation for the ABS and ESC lights being on is:

A. The body shop accidentally disconnected an ABS wheel speed sensor connector while accessing the front bumper area

B. The front bumper replacement introduced a ground fault in the instrument cluster that is illuminating multiple warning lights simultaneously

C. The AEB system fault caused by the disturbed front radar sensor triggered the ABS and ESC warning lights because these systems share active safety warning light infrastructure on this vehicle

D. The ESC steering angle sensor was disturbed during bumper removal, causing both the ESC and ABS lights to illuminate

44. A technician is rebuilding a brake caliper and discovers a pit approximately 2mm wide in the caliper piston seal groove during bore inspection. The pit is located at the 6 o'clock position in the groove. The bore diameter is within specification and the surface is otherwise smooth. The correct action is:

A. Fill the pit with high-temperature epoxy, allow to cure, and proceed with the rebuild since the bore diameter is within specification

B. Expand the bore slightly with a hone to blend the pit into the surrounding surface and proceed with the rebuild

C. Replace the caliper body since the pit prevents the piston seal from seating correctly around its full circumference, and hydraulic pressure will bypass the seal at this location

D. Install an oversized piston seal that will compress into the pit and maintain a seal despite the groove irregularity

45. A customer who frequently drives mountain roads asks a technician for advice on how to prevent brake fade on long downhill grades. The technician's MOST important recommendation is:

A. Upgrade to DOT 5 silicone brake fluid since it has a higher boiling point and will not vapor lock on long descents

B. Use engine braking by selecting a lower gear to control vehicle speed on extended downhill grades, reducing dependence on the service brakes and keeping brake temperatures within safe operating range

C. Apply the brakes firmly and briefly in repeated short applications rather than maintaining steady brake pressure during the descent

D. Install high-performance brake pads with a higher thermal rating since pad fade is the primary cause of brake fade on mountain roads

PRACTICE EXAM 11: ANSWER KEY AND EXPLANATIONS

1. A. Firm pedal confirms hydraulic integrity — contaminated pads generating insufficient friction — A firm pedal that does not sink confirms the hydraulic system is intact and generating adequate pressure. Poor braking performance despite good hydraulic pressure points to a friction problem — contaminated pads cannot convert the available hydraulic clamping force into adequate braking friction. Oil, fluid, or grease contamination produces exactly this combination: good pedal feel with poor stopping power.

2. B. Hydraulic brake system functioning normally — confirms hydraulic circuit integrity — Disconnecting the vacuum supply tests the hydraulic system's capability without power assist. The ability to stop adequately (with more effort) confirms the hydraulic circuit is generating brake force — just without the assist multiplier. This rules out hydraulic system failure as the cause of any pedal complaint. Booster function should then be evaluated separately by reconnecting vacuum and confirming assist is present.

3. B. Test Hydro-Boost accumulator charge after power steering pump replacement — The power steering pump supplies hydraulic fluid pressure to both the steering gear and the Hydro-Boost system. After pump replacement and system bleeding, the Hydro-Boost accumulator must be verified to hold adequate charge. The standard test is to pump the pedal several times after engine shutdown — the accumulator should provide at least two to three power-assisted applications before resistance significantly increases.

4. B. Rear brakes apply with more force than designed — creates rear bias toward lockup — Caliper and wheel cylinder force output equals hydraulic pressure multiplied by piston area. A larger bore area produces more force for the same input pressure. Oversized rear wheel cylinders generate more shoe application force than the vehicle's brake system was engineered for — biasing the brake balance toward the rear and potentially causing rear wheel lockup before the front wheels at the brake force split point the proportioning valve was calibrated for.

5. B. Water on right front pad reduced friction — left front compensated, causing left pull — Water contact with brake pads temporarily reduces their friction coefficient. The right front pad — wet from the puddle crossing — generated significantly less braking force than normal. The left front pad, operating normally on a dry surface, generated proportionally more braking force than the right. The imbalance pulled the vehicle toward the higher-friction left side. As the water evaporated from the right front pad, friction balance was restored and the pull disappeared.

6. B. Drum interior flat spot or localized high spot creating rhythmic knock — A drum with a localized geometric irregularity — a flat spot or high point from a previous hard stop heat event or improper machining — creates one distinct impact per wheel revolution as the shoe contacts the anomaly during each rotation. This produces a rhythmic knock or thump whose frequency exactly matches wheel rotation rate. The irregularity can be confirmed by drum measurement and corrected by resurfacing or replacement.

7. C. Replace drums and shoes, inspect wheel cylinders, inspect parking brake cable — Severely overheated drums require replacement — heat has altered their metallurgy. Glazed shoes must be replaced — glazed lining material provides unpredictable and reduced friction. The wheel cylinders must be inspected because sustained overheating in the rear brake assembly can damage the wheel cylinder cup seals. Finally, the root cause of the extended partial parking brake engagement — a binding cable — must be identified and corrected to prevent recurrence.

8. B. Brake shoes settled away from drums overnight — After drum brake service, the shoes are adjusted to provide minimal running clearance. Overnight as components cool, slight dimensional changes in the metal components — thermal contraction — can increase the shoe-to-drum gap slightly. The first pedal application the next morning must take up this slightly increased clearance before hydraulic pressure builds and braking begins. This is a normal characteristic of drum brake systems and is more noticeable in cold weather.

9. B. Clean tone ring thoroughly — verify signal accuracy before clearing code — Gear oil coating the tone ring teeth fills the spaces between the teeth and reduces the magnetic flux variation that the sensor detects as each tooth passes. The reduced flux change produces a weaker, potentially erratic signal. Thoroughly cleaning the tone ring of all oil contamination restores the tooth-to-gap contrast needed for accurate signal generation. Signal accuracy must be verified with live scan tool data before clearing the DTC.

10. B. Normal condition — check valve retains booster vacuum during throttle-induced manifold vacuum drop — Engine manifold vacuum naturally decreases when the throttle opens during hard acceleration — this is inherent to gasoline engine operation. The booster vacuum check valve is specifically designed to retain the vacuum already stored in the booster front chamber during this temporary manifold vacuum reduction. A correctly functioning check valve maintains booster reserve pressure during acceleration events, providing normal assist when the brakes are next applied.

11. C. Reduced clamping force — tapered pad wear across pad width — A twin-piston floating caliper with one seized piston applies clamping force unequally across the brake pad width — the functional piston side generates full clamping force while the seized piston side applies less. This uneven force distribution across the pad face causes the pad to wear at different rates across its width — thicker on the side of the seized piston. The reduced total clamping force also reduces braking effectiveness at that wheel.

12. B. TCS threshold not exceeded by the wheelspin the customer is experiencing — TCS is designed to intervene when drive wheel slip exceeds a calibrated threshold — not at any detectable wheelspin. If the amount of wheelspin the customer is generating on wet pavement is below the TCS intervention threshold, the system correctly allows the slip to continue without intervening.

This is normal calibration behavior, not a system fault. The customer may need to use more aggressive acceleration to trigger intervention.

13. B. Replace the ABS control module — When a DTC for internal module fault is confirmed after verifying all external components — sensors, solenoids, power supplies, and grounds — are functioning correctly, the fault is isolated to the internal circuitry of the module itself. Module internal faults cannot be repaired in the field. Replacement with a new or remanufactured module is the appropriate service action. Some modules may also require programming after replacement.

14. B. Caliper pistons frozen to brake pads from moisture — motor runs but cannot overcome ice bond — In extreme cold, any moisture trapped between the caliper piston face and the brake pad backing plate can freeze solid, bonding the piston to the pad with significant force. The EPB motor commands the piston to retract but cannot overcome the ice adhesion. The vehicle must be warmed sufficiently to thaw the bond before EPB release is possible. Ensuring proper drainage around rear caliper areas reduces recurrence.

15. B. TCS function within ESC suite activating during hard acceleration — normal TCS operation — ESC systems incorporate TCS as one of their active functions. TCS monitors drive wheel speed versus non-drive wheel speed and intervenes during wheel spin. The selective brake application and engine torque reduction the customer describes are the precise interventions TCS uses to control wheelspin. The TCS light flashing during activation is the normal driver notification. No malfunction has occurred — the system is working correctly.

16. A. Alignment change after control arm replacement altered left rear rolling radius — Replacing a bent control arm changes the rear suspension geometry. Even after alignment, subtle geometry differences from the collision and repair — particularly rear camber or toe — can alter the left rear tire's effective rolling radius relative to the other three wheels. A slightly different rolling radius causes that wheel's speed sensor to report a slightly different speed at any given vehicle speed, triggering ABS when the difference crosses the module's lockup detection threshold.

17. B. Flush entire system and inspect all rubber seals — DOT 5 silicone fluid and DOT 3/4 glycol-based fluids are completely incompatible — they do not mix and form a gel-like mixture that can clog ABS HCU passages. Additionally, silicone fluid is not hygroscopic and can allow free water to accumulate in low points of the hydraulic circuit, where it can cause localized corrosion or boil more readily than dispersed moisture. The entire system must be flushed of all silicone fluid and all rubber components inspected since silicone is not compatible with all glycol-rated seals.

18. A. Front brakes generate more heat — repeated wet-dry cycling creates rust staining at pad edges — Front brake pads consistently absorb more braking energy than rear pads due to forward weight transfer during deceleration. This greater heat generation drives off moisture from the friction surface more effectively but also creates more rapid thermal cycling. The pad edges —

slightly beyond the rotor friction surface — remain cooler and cycle between wet and dry more frequently, creating the rust staining pattern characteristic of the thermally active front position.

19. C. Shoes shifting and contacting drum anchor pins during engine braking — During engine braking, the drivetrain applies a mild retarding force that slightly changes the dynamic loading on the drum brake shoes. This loading shift can cause the shoes to move slightly within their normal clearance range — the shoe tips contacting the drum anchor pins. This tip contact generates the squeal. When the brake pedal is intentionally applied, hydraulic pressure firmly seats the shoes against the drum and anchor pins in their correct position, stopping the squeal.

20. C. Air trapped in HCU passages released during first ABS activation — Pressure bleeding effectively purges air from the wheel circuits and the master cylinder circuit. However, air can remain trapped within the HCU internal passages without performing scan tool solenoid actuation during bleeding. When the ABS first activates during normal driving — an emergency stop or hard braking event — the solenoid cycling stirs the HCU passages and can release trapped air into the main brake circuits, causing spongy pedal afterward. A follow-up bleed with solenoid actuation resolves the condition.

21. B. ABS/ESC system performing daily self-test — Many ABS and ESC systems perform a brief solenoid valve self-test immediately upon first vehicle movement after a key-on cycle. This test actuates the solenoid valves sequentially to verify their function — producing a brief clicking noise from the solenoid actuations. The momentary pedal pulse is the brief pressure change in the hydraulic circuit from the solenoid movement. This self-test behavior is normal, predictable, and indicates the system is actively confirming its own readiness.

22. C. New rotor thicker than original — combined rotor and pad thickness exceeds caliper bridge opening — When a replacement rotor is thicker than the worn original it replaces, the combined assembly of new rotor plus new (thicker) brake pads may exceed the maximum opening distance of the caliper bridge. Even with the piston fully retracted, the total stack height of new rotor plus new pad exceeds what the caliper was designed to accept. Verify that the replacement rotor matches the OEM thickness specification before attempting installation.

23. C. Caliper piston seal partially swollen from solar heat — elevated temperature increases clamping force on that side — A caliper piston seal that has absorbed a small amount of petroleum contamination can swell when heated — solar radiation through a parked vehicle's wheel well area can raise component temperatures significantly. The swollen seal at elevated temperature extends the piston slightly further than normal — pre-loading the pad against the rotor. On the first brake application, this pre-loaded side generates more initial clamping force than the opposite, pulling the vehicle toward the affected side before both sides equalize at normal brake temperature.

24. B. Road salt residue from winter driving — no brake significance — White crystalline deposits on exterior caliper surfaces in winter driving environments are most commonly road salt that has been sprayed onto the undercarriage and has dried on the caliper body. Salt deposits are white and crystalline in appearance. They accumulate most visibly around the bleeder screw area where the screw cap retains moisture. This is a cosmetic finding with no brake system implication.

25. C. Attempt to hydraulically recenter the spool first — A pressure differential valve spool that was displaced by a circuit imbalance — not by an actual pressure differential from a brake system failure — can often be recentered by applying firm pedal pressure with both hydraulic circuits intact. This equalizes pressure on both sides of the spool and allows it to return to center. If the spool recenters and the warning light extinguishes, and the combination valve otherwise functions correctly, it is acceptable to return to service.

26. B. Signal wire has a short to ground along its length — A reference voltage of 0.3 volts instead of 5 volts on the signal wire indicates the 5-volt reference from the ABS module is being pulled down toward ground by a fault in the signal wire circuit. A partial or complete short to ground anywhere along the signal wire between the module and sensor — including inside connectors — will suppress the reference voltage to near ground potential. The resistance across the sensor terminals being in specification rules out the sensor coil as the source of the ground fault.

27. C. Pushrod thermal contraction during cold weather creates additional free play — A master cylinder pushrod that is at the minimum acceptable length specification under normal temperature conditions may contract sufficiently in cold weather to create noticeable additional free play at the brake pedal. This additional cold-weather free play lengthens the distance the pedal must travel before the pushrod contacts the master cylinder piston — lowering the effective pedal height. As the vehicle and components warm, the pushrod returns to its normal length and the pedal height normalizes.

28. C. Proportioning valve installed backward — A proportioning valve installed in the wrong orientation reverses its function — instead of limiting rear circuit pressure above the split point, it limits front circuit pressure. This dramatically reduces front braking force while allowing full pressure to the rear — causing rear lockup during hard stops. The correct part number installed incorrectly produces this symptom. Always verify directional orientation markings on proportioning valves during installation.

29. B. Legitimate momentary fault that has since resolved — no further service if DTC does not return — A DTC that was stored weeks ago, whose associated sensor now tests correctly in all modes, and that does not return after clearing during a complete road test, most likely represents a transient fault event that has resolved. Replacing a sensor that currently functions correctly based solely on a historical DTC that has cleared is not justified. The correct approach is to clear the code, thoroughly road test, and return the vehicle with instructions to the customer to report immediately if the light returns.

30. A. Rear caliper pistons extended as rear pads have worn — As rear disc brake pads wear, the caliper pistons extend progressively from the bore to maintain pad-to-rotor contact. The fluid volume that fills the growing space behind the extended piston comes from the rear circuit reservoir compartment. Because the two reservoir compartments are separate and serve their respective circuits, only the rear compartment level drops as rear pads wear — the front compartment level remains unaffected. Low rear compartment with full front compartment and no leaks is a diagnostic indicator of worn rear brake pads.

31. B. Remove slide pins, clean all petroleum contamination, replace damaged boots and caps, apply correct grease — Petroleum-based grease is incompatible with rubber brake components — it causes swelling and deterioration. The swollen boots and caps confirm contamination has occurred. All petroleum contamination must be thoroughly removed from the pins and bores, damaged rubber components must be replaced, and the correct caliper-specific synthetic grease must be applied before reassembly. The hydraulic system was not directly affected since the petroleum contamination was limited to the mechanical slide pin area.

32. B. Right rear parking brake cable has broken — Slack cable with no tension when the lever is applied indicates the mechanical link between the lever and the right rear shoe has failed. A broken cable transmits no force regardless of how far the lever travels. A broken actuating lever inside the drum would show cable tension at the lever — the force would be transmitted to the cable but go nowhere afterward. No cable tension at all during lever application points to cable failure.

33. A. Reservoir internal divider has cracked — compartments communicating through crack — A master cylinder reservoir with two separate compartments serves its safety function only if the compartments are completely sealed from each other. Fluid transferring from one compartment to the other when the cap is removed indicates the internal divider has failed — cracked or broken. This eliminates the redundancy of the dual-circuit design — a leak in one circuit will now also drain the other circuit's reservoir compartment. The master cylinder must be replaced.

34. B. Check the ABS module fuse and the ignition-switched power feed wiring — A DTC for module power supply fault with all external sensor and actuator circuits confirmed functional indicates the problem is in the power delivery path to the module itself — before the module's internal circuits. The most common and simple cause is a blown fuse in the ignition-switched power feed circuit. The wiring from the fuse to the module connector should also be inspected for open circuits or high resistance connections.

35. B. Rear drum brake shoes settled away from drum during two-week storage — During extended storage — particularly in cold weather — rear drum brake shoe return springs contract slightly and the shoes pull away from the drum interior slightly more than during normal driving. The first one to two pedal strokes on the first drive take up this additional clearance gap before normal braking begins. The condition resolves after the initial applications and does not return during normal driving because the automatic adjusters and normal operating temperatures maintain correct running clearance.

36. B. Replace axle seal, replace both rear shoes as a set, inspect and clean the drum — Brake shoe lining contaminated with gear oil cannot be decontaminated — the oil has saturated the porous lining material and any residual oil will re-migrate to the friction surface. Both rear shoes must be replaced as a matched set — replacing only the contaminated right shoe leaves mismatched friction coefficients between left and right rear. The drum must be cleaned of oil residue and inspected for glazing. The wheel cylinder should also be checked since oil can migrate along the axle toward the cylinder.

37. C. Thermal expansion of brake components progressively reducing running clearance — During extended driving, brake components build heat from normal use. Cast iron rotors, aluminum caliper bodies, and steel pads all expand as temperature rises. This thermal expansion progressively reduces the running clearance between the pad and rotor — the caliper piston must extend slightly less to achieve contact. As the effective piston extension required decreases, the pedal height where pressure builds rises. After overnight cooling, all components return to their ambient temperature dimensions and pedal height normalizes.

38. B. Left front caliper slide pins binding — caliper not fully releasing — A caliper that does not fully retract after each brake application drags continuously against the rotor — generating heat proportional to the drag force and vehicle speed. After burnishing, which involves multiple brake applications from moderate speed, a dragging caliper has had sufficient time to generate noticeably elevated rotor temperature compared to the freely releasing right front. Inspecting and freeing the slide pins, cleaning and lubricating them, and replacing torn boots resolves the drag condition.

39. B. Check and adjust master cylinder pushrod length to specification — After installing a new booster/master cylinder assembly, the pushrod length connecting the booster output rod to the master cylinder piston must be verified and adjusted to specification. A pushrod that is too long blocks the compensating port at rest — creating brake drag and a high pedal. A pushrod too short creates excessive free play and reduced pedal effectiveness. This adjustment is a critical step specific to booster/master cylinder replacement that must be performed before road testing.

40. B. ABS preserved — TCS brake intervention disabled — TCS uses dedicated solenoid valve circuits to apply brake pressure to spinning drive wheels independently of driver pedal input. A fault in the TCS solenoid circuit disables this TCS-specific brake intervention function. The ABS solenoid circuits — confirmed normal by testing — remain fully functional and provide complete ABS wheel lockup protection. The two systems use overlapping but distinct solenoid valve circuits, and a fault in TCS-specific circuits does not disable ABS.

41. B. Fixed caliper unequal pad wear indicates inboard piston issue — A fixed caliper has equal pistons on both inboard and outboard sides — it does not float. Both piston pairs should apply equal force to the pad. If the outboard pad wears faster on a fixed caliper, the inboard piston is not applying its full designed force. Possible causes include a sticking or seized inboard piston, a swollen inboard piston seal preventing full extension, or a blocked inboard fluid passage. The caliper should be inspected for inboard piston movement restriction.

42. B. Air trapped in rear circuit from bleed prevents HSA from building adequate holding pressure — Hill Start Assist holds the vehicle stationary on an incline by maintaining brake pressure in the rear circuit (or all four wheels on some systems) after the brake pedal is released. If the rear brake circuit contains air from the bleed procedure, the air compresses under the HSA pressure command — the system cannot build adequate holding pressure in the circuit to prevent the vehicle from rolling. A follow-up bleed of the rear circuit with scan tool solenoid actuation purges the air and restores HSA function.

43. C. Front radar sensor serves AEB system — ABS and ESC warning lights illuminate when AEB is disabled because these systems share warning light infrastructure — Modern ADAS systems including AEB, ABS, and ESC are integrated within the vehicle's active safety architecture. On many vehicles, disabling one active safety system triggers illumination of warning lights from related systems because the vehicle's overall active safety capability is compromised. The bumper cover replacement disturbed or displaced the front radar sensor, disabling AEB — which caused the ABS and ESC warning lights to illuminate as part of the shared active safety system notification network.

44. C. Caliper body must be replaced — pit in seal groove prevents correct seal seating — The caliper piston seal sits in a precision-machined seal groove within the caliper bore. The seal's sealing effectiveness depends on uniform contact around the entire circumference of the groove. A pit 2mm wide in the seal groove creates a gap in the seal's contact surface — hydraulic pressure will find this path and bypass the seal. This condition cannot be repaired by honing, filling, or any field repair method. The caliper body must be replaced.

45. B. Use engine braking on extended downhill grades to reduce service brake dependence — The most critical mountain driving advice is to use lower gear selections to allow the engine and drivetrain to control vehicle speed on extended descents. Relying on the service brakes alone for speed control on long grades generates continuous heat that gradually raises brake fluid temperature, reduces pad friction coefficient through fade, and reduces the safety margin available for emergency stopping situations. Engine braking distributes the workload away from the brake system and maintains it within safe operating temperature ranges.