PRACTICE EXAM 13

1. Which statement correctly contrasts air and hydraulic brake failure modes?

A. Both systems fail toward release on loss of the medium

B. Air fails toward apply; hydraulic fails toward release

C. Both systems fail toward apply on loss of the medium

D. Air fails toward release; hydraulic fails toward apply

2. In an air brake system, the pressure source is the compressor, whereas in a hydraulic system the pressure source is:

A. The relay valve

B. The air dryer

C. The driver's foot effort plus a booster

D. The spring brake chamber

3. Compared to cut-out, the governor's cut-in pressure is:

A. Higher than cut-out

B. Lower than cut-out

C. Equal to cut-out

D. Equal to the relief setting

4. A static leak appears with the brakes released, whereas an applied leak appears:

A. Only when the brakes are applied and held

B. Only when the engine is running

C. Only during the air dryer purge

D. Only at governor cut-out

5. The relay valve speeds both apply and release, whereas the quick-release valve speeds:

A. Release only, via a local exhaust port

B. Apply only, via a larger supply line

C. Neither apply nor release

D. The governor cut-out timing

6. An S-cam drum brake uses an external slack adjuster, whereas an air disc brake uses:

A. A larger brake chamber

B. No friction material

C. A manual cam adjuster

D. An internal automatic adjuster

7. A drum brake is measured for maximum diameter, whereas an air disc rotor is measured for:

A. Maximum diameter

B. Pushrod stroke

C. Minimum thickness and runout

D. Governor cut-out

8. Compared to a drum brake, an air disc brake generally offers:

A. Worse heat dissipation

B. No need for friction material

C. A higher moisture content

D. Better fade resistance from a vented rotor

9. The service section of a combination chamber is air-applied, whereas the spring section is:

A. Applied by air pressure

B. Operated by hydraulic fluid

C. Controlled by the foot valve only

D. Held released by air and applied by spring force

10. ABS prevents wheel lockup during braking, whereas ATC prevents:

A. Air dryer freezing

B. Excessive pushrod stroke

C. Drive-wheel spin during acceleration

D. Brake fluid contamination

11. ATC uses the same wheel speed sensors as ABS, whereas ESC additionally uses:

A. Steering angle, yaw rate, and lateral acceleration sensors

B. Brake fluid level sensors

C. Compressor speed sensors

D. Lining thickness sensors

12. A tapered roller bearing's inner race is the cone, whereas the outer race pressed into the hub is the:

A. Cage

B. Spider

C. Cup

D. Diaphragm

13. A grease-packed bearing is checked by scheduled repacking, whereas an oil-lubricated hub is checked by:

A. Measuring pushrod stroke

B. Viewing the level through a sight-glass cap

C. Caging the spring brake

D. Reading the governor cut-out

14. An over-tight wheel bearing overheats, whereas an under-adjusted bearing exhibits:

A. Rapid seizure from preload

B. Constant air dryer purging

C. A higher governor cut-out

D. Excessive end play and a wandering brake

15. Bearing noise changes with road speed and cornering, whereas brake noise changes with:

A. Brake application

B. Air dryer purge timing

C. Governor cut-out

D. Reservoir capacity

16. A pure hydraulic system makes pressure with the foot and booster, whereas an air-over-hydraulic system makes hydraulic pressure with:

A. Engine vacuum at the wheel cylinders

B. Spring brakes at every wheel

C. The wheel speed sensors

D. An air-powered actuator

17. A spongy pedal indicates air or boiled fluid, whereas a pedal that slowly sinks under steady pressure indicates:

A. A glazed lining

B. Internal master-cylinder bypass

C. An over-tight wheel bearing

D. A saturated air dryer

18. Moisture contamination lowers brake fluid's boiling point, whereas petroleum contamination:

A. Raises the boiling point safely

B. Improves the pedal feel

C. Speeds the air dryer purge

D. Swells and destroys rubber seals

19. A drum brake's pull comes from mismatched slack adjusters or chambers, whereas a disc brake's pull typically comes from:

A. A seized caliper applying one pad

B. A saturated air dryer

C. A low governor cut-out

D. An over-purging dryer

20. The compressor creates air, whereas the governor:

A. Removes moisture from the air

B. Controls when the compressor loads and unloads

C. Stores the compressed air

D. Meters air to the brake chambers

21. The air dryer removes moisture and oil, whereas the reservoirs:

A. Compress the air further

B. Store the air for braking and accessories

C. Read the wheel speed

D. Cage the spring brakes

22. A foot valve leaking at the exhaust port when released points to the supply side, whereas a leak only when applied points to the:

A. Application side

B. Wheel bearing

C. Air dryer desiccant

D. Governor signal line

23. A manual slack adjuster requires periodic adjustment, whereas an automatic slack adjuster:

A. Requires no inspection at all

B. Self-adjusts for lining wear during operation

C. Converts air to hydraulic pressure

D. Reads the wheel speed

24. A relief valve venting at 150 psi signals over-pressure, whereas the low-pressure warning signals:

A. A governor cut-out fault

B. An over-tight wheel bearing

C. Pressure dropping toward a dangerous level near 60 psi

D. A saturated air dryer

25. The pressure protection valve sacrifices accessory air, whereas the double check valve:

A. Drains both reservoirs

B. Increases compressor output

C. Passes the higher-pressure of two inlets

D. Limits pushrod stroke

26. A drum brake's force path ends at the S-cam and shoes, whereas an air disc brake's force path ends at the:

A. Master cylinder and wheel cylinder

B. Slack adjuster and camshaft

C. Air dryer and reservoir

D. Caliper and pads on the rotor

27. Excessive pushrod stroke means a brake applies late and weak, whereas correct stroke means the brake:

A. Cannot release

B. Builds pressure faster

C. Applies with full force and proper clearance

D. Purges the dryer

28. The spring brake serves as the parking brake, whereas during operation a sudden air loss makes it serve as the:

A. Automatic emergency brake

B. Service brake

C. Accessory air supply

D. Compressor unloader

29. A wheel speed sensor reads a tone ring, whereas a steering angle sensor reads:

A. Brake line pressure

B. The driver's steering input

C. Lining thickness

D. Reservoir pressure

30. Anti-compounding prevents force stacking, whereas the pressure protection valve:

A. Cages the spring brakes

B. Converts air to hydraulic pressure

C. Preserves brake air by cutting off accessories

D. Reads the wheel speed

31. A static leak test uses the brakes released, whereas the applied test uses the brakes:

A. Applied and held

B. Pumped rapidly

C. Partially released

D. Caged

32. A dial indicator measures rotor runout and bearing end play, whereas a micrometer measures:

A. Sensor air gap

B. Governor cut-out

C. Drum diameter and rotor thickness

D. Leak rate per minute

33. A bus pulls toward the side with stronger braking, whereas a contaminated lining brakes:

A. Harder than a clean lining

B. The same as a clean lining

C. Less than a clean lining, so the bus pulls away from it

D. Only when the dryer purges

34. The treadle valve meters air on apply, whereas on release it:

A. Compresses new air

B. Cages the spring brakes

C. Raises the governor cut-out

D. Opens an exhaust path to release the brakes

35. A combination chamber combines a service and spring section, whereas a standard service chamber has:

A. Only a service section with a diaphragm and pushrod

B. Two spring sections

C. A hydraulic master cylinder

D. A wheel speed sensor

36. Kinetic energy rises with the square of speed, whereas it rises with weight:

A. In direct proportion

B. With the square of weight

C. With the cube of weight

D. Inversely

37. A check valve allows one-direction flow to protect stored air, whereas a relay valve:

A. Drains both reservoirs

B. Speeds apply and release at the far chambers

C. Increases compressor output

D. Reads wheel speed

38. ABS control logic is identical on air and hydraulic systems, whereas the modulated medium differs as:

A. Spring force versus vacuum

B. Hydraulic fluid versus spring force

C. Vacuum versus air

D. Air versus brake fluid

39. A worn compressor passes oil downstream, whereas a saturated air dryer passes:

A. Spring force to the chambers

B. Hydraulic fluid to the wheels

C. Moisture to the reservoirs

D. Wheel speed to the ECU

40. A parking brake won't release at low pressure because pressure is inadequate, whereas it won't release at full pressure due to a:

A. Saturated air dryer

B. Mechanical bind or spring-circuit restriction

C. Glazed lining

D. Failed wheel speed sensor

41. A wheel seal failure starves the bearing, whereas it also:

A. Raises the governor cut-out

B. Speeds the air dryer purge

C. Increases reservoir capacity

D. Contaminates the brake friction surface

42. Glazing lowers the lining's friction coefficient, whereas scoring is a:

A. Hardened glassy surface from heat

B. Grooved wear pattern on the drum or rotor

C. Loss of all braking

D. Type of air leak

43. The supply (wet) reservoir collects moisture first, whereas the primary and secondary reservoirs:

A. Read wheel speed

B. Cage the spring brakes

C. Supply the two independent brake circuits

D. Increase the governor cut-out

44. A vacuum booster uses engine vacuum, whereas a hydro-boost uses:

A. Compressed air

B. Power-steering hydraulic pressure

C. Spring force

D. Wheel speed signals

45. The air dryer purges at cut-out, whereas it captures moisture during the:

A. Loaded (drying) cycle

B. Spring brake application

C. Foot valve release

D. Wheel bearing adjustment

46. A drum is replaced when worn beyond maximum diameter, whereas a rotor is replaced when:

A. The governor cut-out is too low

B. The desiccant is saturated

C. The wheel bearing is loose

D. It is below minimum thickness or cracked beyond limits

47. ABS mainly maintains steering control, whereas it does NOT guarantee:

A. Loss of all braking on a fault

B. A shorter stop on every surface

C. Reversion to normal braking

D. Use of wheel speed sensors

48. A combination chamber's parking brake is applied by exhausting the spring section, whereas it is released by:

A. Delivering air to the spring section

B. Caging the service diaphragm

C. Pressing the foot valve

D. Reaching governor cut-out

49. A relay valve sticking closed on apply slows application, whereas one that won't exhaust on release causes:

A. Faster purging

B. Higher cut-out

C. A dragging brake

D. Reduced bearing end play

50. A leak that fails the static test points to the supply side, whereas one that fails only the applied test points to the:

A. Wheel bearing

B. Application side

C. Governor signal line

D. Air dryer desiccant

51. A tapered roller bearing carries radial load, whereas in opposed pairs it also carries:

A. Hydraulic pressure

B. Spring force

C. Wheel speed signals

D. Axial thrust (cornering) load

52. A push-pull parking knob applies the brakes when pulled, whereas it releases them when:

A. Pushed in to deliver air

B. Pulled further out

C. The engine stops

D. The air dryer purges

53. A spring chamber may be caged safely, whereas it must never be:

A. Inspected for leaks

B. Replaced as a sealed unit

C. Disassembled or torched

D. Secured before service

54. Manual back-adjusting an automatic slack adjuster masks a fault, whereas the correct action for long stroke is to:

A. Replace the drum

B. Increase chamber pressure

C. Diagnose the underlying cause

D. Raise the governor cut-out

55. A pure air brake uses chambers directly, whereas an air-over-hydraulic system uses air to:

A. Cage the spring brakes

B. Read wheel speed

C. Apply vacuum at the wheels

D. Generate hydraulic pressure through an actuator

56. Documentation records readings against limits, whereas a subjective impression:

A. Is the preferred record

B. Is inadequate as documentation

C. Replaces measurement tools

D. Satisfies compliance alone

57. A wheel speed sensor code indicates a circuit area, whereas replacing the sensor before testing risks:

A. Missing an air gap, tone ring, or wiring fault

B. Raising the governor cut-out

C. Caging the spring brakes

D. Increasing reservoir capacity

58. The compressor builds when pressure is below cut-in, whereas it unloads when pressure reaches:

A. The relief setting

B. The warning point

C. Cut-in again

D. Cut-out

59. A leaking wheel cylinder shows fluid at the backing plate, whereas a worn wheel bearing shows:

A. Fluid at the dryer exhaust

B. Air at the foot valve

C. Spring force loss

D. A growl rising with road speed

60. A bus loses one circuit and retains the other, whereas total loss of all service braking would require:

A. Failure of a shared component, not one circuit

B. A single-circuit leak only

C. A saturated air dryer

D. A glazed lining on one wheel

Answer Key & Full Answer Explanations

1. B — Air systems fail toward apply because spring brakes apply on air loss, while hydraulic systems fail toward release because fluid loss leaves no pressure. This contrast is the defining safety difference and the reason heavy buses use air.

2. C — In a hydraulic system the pressure source is the driver's foot effort plus a booster, while in an air system the compressor is the source. The relay valve, dryer, and spring chamber are not pressure sources for hydraulic braking.

3. B — Cut-in is lower than cut-out, normally about 20 to 25 psi below it, so the system cycles through a working range. It is not higher than, equal to, or tied to the relief setting.

4. A — An applied leak appears only when the brakes are applied and held, implicating application-side components. It is not tied to the engine running, the purge, or cut-out.

5. A — The quick-release valve speeds release only, via a local exhaust port near the chambers, while the relay valve speeds both apply and release. It does not speed apply via a supply line or affect cut-out timing.

6. D — An air disc brake uses an internal automatic adjuster in the caliper, whereas an S-cam drum brake uses an external slack adjuster. It does not rely on a larger chamber, eliminate friction material, or use a manual cam adjuster.

7. C — An air disc rotor is measured for minimum thickness and runout, whereas a drum is measured for maximum diameter. Pushrod stroke and cut-out are not rotor measurements.

8. D — An air disc brake offers better fade resistance because its open or vented rotor sheds heat better than an enclosed drum. It does not have worse dissipation, eliminate friction material, or hold more moisture.

9. D — The spring section is held released by air and applied by spring force, the reverse of the air-applied service section. It is not air-applied, hydraulic, or foot-valve-only.

10. C — ATC prevents drive-wheel spin during acceleration, whereas ABS prevents lockup during braking. ATC does not address dryer freezing, stroke, or fluid contamination.

11. A — ESC additionally uses steering angle, yaw rate, and lateral acceleration sensors beyond the ABS wheel speed sensors that ATC shares. Fluid level, compressor speed, and lining sensors are not part of ESC.

12. C — The outer race pressed into the hub is the cup, while the inner race is the cone. The cage holds the rollers, the spider is a brake part, and the diaphragm is in a chamber.

13. B — An oil-lubricated hub is checked by viewing the level through a sight-glass cap, whereas a grease-packed bearing relies on scheduled repacking. Stroke, caging, and cut-out are unrelated to lubrication checks.

14. D — An under-adjusted bearing exhibits excessive end play and a wandering brake, whereas an over-tight bearing overheats. It does not seize from preload, purge the dryer, or raise cut-out.

15. A — Brake noise changes with brake application, whereas bearing noise changes with road speed and cornering. Purge timing, cut-out, and capacity do not govern noise.

16. D — An air-over-hydraulic system makes hydraulic pressure with an air-powered actuator, whereas a pure hydraulic system uses the foot and booster. It does not use vacuum at the wheel cylinders, spring brakes, or the sensors.

17. B — A pedal that slowly sinks under steady pressure indicates internal master-cylinder bypass, whereas a spongy pedal indicates air or boiled fluid. A glazed lining, bearing, or dryer is unrelated.

18. D — Petroleum contamination swells and destroys rubber seals, whereas moisture lowers the boiling point. It does not raise the boiling point safely, improve pedal feel, or speed purging.

19. A — A disc brake's pull typically comes from a seized caliper applying one pad, whereas a drum brake's pull comes from mismatched slack adjusters or chambers. A dryer or cut-out does not cause side-to-side pull.

20. B — The governor controls when the compressor loads and unloads, whereas the compressor creates the air. It does not remove moisture, store air, or meter air to the chambers.

21. B — The reservoirs store the air for braking and accessories, whereas the dryer removes moisture and oil. They do not compress further, read wheel speed, or cage springs.

22. A — A foot valve leak only when applied points to the application side, whereas a leak when released points to the supply-side inlet seal. The bearing, desiccant, and governor signal line are unrelated.

23. B — An automatic slack adjuster self-adjusts for lining wear during operation, whereas a manual one requires periodic adjustment. It still requires inspection, does not convert to hydraulic pressure, and does not read wheel speed.

24. C — The low-pressure warning signals pressure dropping toward a dangerous level near 60 psi, whereas a relief valve venting at 150 psi signals over-pressure. It is not a cut-out fault, bearing, or dryer signal.

25. C — The double check valve passes the higher-pressure of two inlets, whereas the pressure protection valve sacrifices accessory air. It does not drain reservoirs, increase output, or limit stroke.

26. D — An air disc brake's force path ends at the caliper and pads on the rotor, whereas a drum brake's ends at the S-cam and shoes. The master/wheel cylinder and dryer/reservoir are not the disc-brake endpoint.

27. C — Correct stroke means the brake applies with full force and proper clearance, whereas excessive stroke means late, weak application. Correct stroke does not prevent release, build pressure faster, or purge the dryer.

28. A — A sudden air loss during operation makes the spring brake serve as the automatic emergency brake, whereas when parked it is the parking brake. It is not a service brake, accessory supply, or compressor unloader.

29. B — A steering angle sensor reads the driver's steering input, whereas a wheel speed sensor reads a tone ring. It does not read brake-line pressure, lining thickness, or reservoir pressure.

30. C — The pressure protection valve preserves brake air by cutting off accessories, whereas anti-compounding prevents force stacking. The protection valve does not cage springs, convert to hydraulic, or read wheel speed.

31. A — The applied test uses the brakes applied and held, whereas the static test uses the brakes released. Pumping, partial release, and caging are not the applied-test condition.

32. C — A micrometer measures drum diameter and rotor thickness, whereas a dial indicator measures runout and bearing end play. It does not measure sensor air gap, cut-out, or leak rate.

33. C — A contaminated lining brakes less than a clean lining, so the bus pulls away from the contaminated side toward the stronger one. It does not brake harder, the same, or only during purge.

34. D — On release the treadle valve opens an exhaust path to release the brakes, whereas on apply it meters air. It does not compress new air, cage springs, or raise cut-out.

35. A — A standard service chamber has only a service section with a diaphragm and pushrod, whereas a combination chamber adds a spring section. It does not have two spring sections, a master cylinder, or a sensor.

36. A — Kinetic energy rises in direct proportion to weight, whereas it rises with the square of speed. It is not the square or cube of weight, nor inverse.

37. B — A relay valve speeds apply and release at the far chambers, whereas a check valve allows one-direction flow to protect stored air. It does not drain reservoirs, increase output, or read wheel speed.

38. D — The modulated medium differs as air versus brake fluid, while the ABS control logic is identical. It is not spring force, vacuum, or hydraulic fluid versus spring force.

39. C — A saturated air dryer passes moisture to the reservoirs, whereas a worn compressor passes oil downstream. It does not pass spring force, hydraulic fluid, or wheel speed.

40. B — A parking brake that won't release at full pressure points to a mechanical bind or spring-circuit restriction, whereas at low pressure the cause is inadequate pressure. A dryer, glazed lining, or sensor is unrelated.

41. D — A wheel seal failure also contaminates the brake friction surface, in addition to starving the bearing. It does not raise cut-out, speed purging, or increase capacity.

42. B — Scoring is a grooved wear pattern on the drum or rotor, whereas glazing is a hardened glassy surface from heat. Scoring is not a loss of all braking or an air leak.

43. C — The primary and secondary reservoirs supply the two independent brake circuits, whereas the wet tank collects moisture first. They do not read wheel speed, cage springs, or raise cut-out.

44. B — A hydro-boost uses power-steering hydraulic pressure, whereas a vacuum booster uses engine vacuum. It does not use compressed air, spring force, or wheel speed signals.

45. A — The air dryer captures moisture during the loaded (drying) cycle and purges at cut-out. Capture does not occur during spring application, foot valve release, or bearing adjustment.

46. D — A rotor is replaced when below minimum thickness or cracked beyond limits, whereas a drum is replaced beyond maximum diameter. Cut-out, desiccant, and bearing condition are not rotor-replacement criteria.

47. B — ABS does not guarantee a shorter stop on every surface, since its core benefit is steering control; on some loose surfaces stops can lengthen. It does not lose all braking on a fault, fail to revert to normal braking, or omit wheel speed sensors.

48. A — A combination chamber's parking brake is released by delivering air to the spring section, whereas it is applied by exhausting that air. Caging the diaphragm, the foot valve, and cut-out do not release it.

49. C — A relay valve that won't exhaust on release causes a dragging brake, whereas one stuck closed on apply slows application. It does not speed purging, raise cut-out, or reduce bearing end play.

50. B — A leak failing only the applied test points to the application side, whereas one failing the static test points to the supply side. The bearing, governor signal line, and desiccant are unrelated.

51. D — In opposed pairs, tapered roller bearings also carry axial thrust (cornering) load in addition to radial load. They do not carry hydraulic pressure, spring force, or wheel speed signals.

52. A — The push-pull knob releases the parking brakes when pushed in to deliver air, whereas it applies them when pulled out. Pulling further, stopping the engine, or purging do not release them.

53. C — A spring chamber must never be disassembled or torched because the power spring stores lethal energy, whereas it may safely be caged. Inspecting, replacing as a sealed unit, and securing before service are all acceptable.

54. C — The correct action for long stroke on an automatic slack adjuster is to diagnose the underlying cause, whereas manual back-adjustment masks the fault. Replacing the drum, raising pressure, or raising cut-out do not address it.

55. D — An air-over-hydraulic system uses air to generate hydraulic pressure through an actuator, whereas a pure air brake uses chambers directly. It does not cage springs, read wheel speed, or apply vacuum at the wheels.

56. B — A subjective impression is inadequate as documentation, whereas recording readings against limits is proper. It is not the preferred record, a replacement for tools, or sufficient for compliance alone.

57. A — Replacing the sensor before testing risks missing an air gap, tone ring, or wiring fault, since the code indicates a circuit area. It does not raise cut-out, cage springs, or increase capacity.

58. D — The compressor unloads when pressure reaches cut-out, whereas it builds when pressure is below cut-in. It does not unload at the relief setting, warning point, or cut-in.

59. D — A worn wheel bearing shows a growl rising with road speed, whereas a leaking wheel cylinder shows fluid at the backing plate. The bearing does not produce dryer-exhaust fluid, foot-valve air, or spring-force loss.

60. A — Total loss of all service braking would require failure of a shared component, not one circuit, since losing one circuit retains the other. A single-circuit leak, saturated dryer, or one glazed lining would not cause total service-brake loss.