PRACTICE EXAM 15 SIMULATION (60 QUESTIONS)

1. If a mechanic installs a circuit breaker rated higher than the wire's safe capacity, the likely result is that the:

A. Circuit will operate more efficiently

B. Breaker will trip more often than before

C. Voltage on the bus will increase

D. Wiring can overheat without the breaker tripping

2. If a flexible hydraulic hose is installed dead straight and pulled tight, what happens when the system is pressurized?

A. The hose lengthens and sags loosely

B. The hose contracts and stresses the end fittings

C. The hose flow rate doubles

D. The hose changes its lay-line color

3. If a steel wire brush is used to clean corrosion from an aluminum panel, the result is that:

A. The aluminum becomes harder and stronger

B. The corrosion is permanently neutralized

C. Embedded steel particles create new galvanic corrosion

D. The surface is left ready for paint with no treatment

4. If an aircraft is weighed without being leveled in both axes, the consequence is that the:

A. Arm measurements are invalid and the CG is inaccurate

B. Total weight reads exactly zero

C. Tare weight is automatically removed

D. Datum shifts to the center of gravity

5. If oil contacts high-pressure oxygen in a servicing line, the likely result is:

A. The oxygen purity slowly improves

B. The regulator freezes solid

C. The gauge reads artificially high

D. A spontaneous and violent ignition

6. If a tube is flared without first deburring the inside of the cut, the result is that the:

A. Flare angle automatically becomes 45 degrees

B. Burr restricts flow and may break loose to contaminate the system

C. Tube wall becomes measurably thicker

D. Flare seats more tightly than normal

7. If a fiber-insert self-locking nut is installed next to a hot exhaust, the likely consequence is that the:

A. Insert degrades and loses its locking ability

B. Nut becomes permanently fused to the bolt

C. Bolt gains tensile strength from the heat

D. Insert hardens and grips more tightly

8. If an applicable Airworthiness Directive is left uncomplied with, the aircraft's status is that it:

A. Remains airworthy if the annual is current

B. Becomes airworthy after an owner's waiver

C. Is unairworthy until the AD is complied with

D. Is exempt because the AD is advisory

9. If a series circuit develops an open at one component, the effect on the circuit is that:

A. The other components continue operating

B. The total current increases sharply

C. The voltage divides more evenly

D. All current flow stops

10. If two dissimilar metals are joined in direct contact with an electrolyte present, the result is:

A. A protective oxide that stops all corrosion

B. An increase in both metals' strength

C. No measurable chemical reaction

D. Galvanic corrosion of the more active metal

11. If a mechanic over-torques a fastener beyond its specified value, the likely result is that the:

A. Joint loosens during operation

B. Threads gain additional strength

C. Fastener is overstressed and may fail

D. Torque becomes self-adjusting

12. If safety wire is installed so that loosening would slacken it rather than tighten it, the result is that the:

A. Wire permits the fastener to loosen

B. Fastener is locked more securely

C. Wire tension increases automatically

D. Bolt gains corrosion resistance

13. If a gas-law calculation is performed using Celsius instead of an absolute temperature scale, the result will be:

A. Slightly more accurate than using Rankine

B. Grossly incorrect

C. Identical to using Kelvin

D. Valid only above the boiling point

14. If an aircraft's CG is loaded aft of the rear limit, the effect on handling is:

A. Increased nose-heaviness and heavy controls

B. No change to stability or control

C. Reduced stability and possible loss of control

D. Perfect balance in all flight regimes

15. If paint is applied over a greasy, contaminated surface, the consequence is that the:

A. Finish cures harder than over a clean surface

B. Paint fails to adhere and corrosion forms underneath

C. Panel gains structural strength

D. Surface becomes easier to inspect

16. If a mechanic uses jet fuel in a piston (reciprocating) engine, the likely result is:

A. Improved fuel economy

B. Cleaner combustion and less wear

C. A higher allowable gross weight

D. Engine failure

17. If the wrong-rated fuse continually opens a circuit, replacing it with a higher-rated fuse will most likely:

A. Permanently solve the underlying problem

B. Improve the circuit's voltage

C. Reduce the load's current draw

D. Remove protection and allow the wire to overheat

18. If a 100-hour-inspection interval is exceeded by more than the allowed 10 hours, the consequence is that the aircraft:

A. Gains bonus hours on the next interval

B. May continue flying for hire indefinitely

C. Is no longer in compliance and cannot be operated for hire

D. Requires only a verbal note in the log

19. If too much metal is removed during corrosion removal, exceeding the structural limit, the part becomes:

A. Stronger due to the smoother surface

B. Unairworthy and must be repaired or replaced

C. Airworthy after a conversion coating

D. Acceptable if repainted

20. If a mechanic fails to subtract tare weight when weighing an aircraft, the result is that the:

A. Center of gravity moves aft

B. Useful load is calculated correctly

C. Datum location changes

D. Empty weight is recorded too high

21. If aircraft loads were wired in series rather than parallel across the bus, the effect would be that:

A. Each load would receive a higher voltage

B. One load failing open would shut off all the others

C. The total resistance would decrease

D. Circuit protection would be unnecessary

22. If a self-tapping screw is used to attach a primary structural fitting, the result is an installation that is:

A. Acceptable because it cuts its own thread

B. Incorrect, because the screw is non-structural

C. Stronger than a bolted joint

D. Acceptable for any load if torqued

23. If a mechanic adds MIL-H-5606 mineral fluid to a Skydrol (phosphate-ester) system, the consequence is:

A. The seals swell or dissolve and the system is damaged

B. The fluid performance improves

C. The two blend into a superior fluid

D. No effect, since fluids are interchangeable

24. If an aircraft is operated 60 lb over its maximum gross weight but within CG limits, its status is:

A. Airworthy because the CG is correct

B. Airworthy if the excess is baggage

C. Within limits because weight is unregulated

D. Not airworthy until the overweight is corrected

25. If a mechanic resumes work after a distraction without re-verifying, the most likely consequence is that:

A. The job is completed faster with no risk

B. The tools are automatically accounted for

C. The work quality improves

D. A step may be skipped and a defect introduced

26. If a magnetic particle inspection is attempted on an aluminum part, the result is that:

A. The flaws are revealed clearly

B. The part is magnetized permanently

C. No useful indication is produced

D. The aluminum becomes ferromagnetic

27. If a mechanic fuels an aircraft without bonding and grounding it first, the danger is that:

A. The fuel will be the wrong grade

B. Static electricity may ignite fuel vapors

C. The gauges will read inaccurately

D. The tank will overfill automatically

28. If two 8-ohm resistors are connected in parallel, the resulting total resistance is:

A. 16 ohms

B. 8 ohms

C. 0.25 ohms

D. 4 ohms

29. If a hardened steel part is not subsequently tempered, the likely consequence is that it remains:

A. Excessively brittle and prone to cracking

B. Too soft to hold an edge

C. Unable to be magnetized

D. Identical to an annealed part

30. If a maintenance entry is made without the signer's certificate number, the consequence is that the:

A. Return-to-service approval is incomplete and invalid

B. Aircraft gains additional resale value

C. Entry becomes legally stronger

D. Work is automatically certified

31. If a mechanic exceeds the nose-gear steering limit while towing an aircraft, the likely result is:

A. A tighter, safer turn

B. Improved ground maneuverability

C. Reduced tire wear

D. Damage to the nose-gear steering mechanism

32. If an aircraft battery's electrolyte is spilled and left in the battery box, the consequence over time is:

A. Improved electrical conductivity

B. A stronger battery mounting

C. Accelerated corrosion of nearby metal

D. A higher state of charge

33. If a wing exceeds its critical angle of attack, the immediate aerodynamic result is that:

A. Airflow separates and lift drops abruptly

B. Lift continues to increase steadily

C. The engine produces more thrust

D. Drag falls to near zero

34. If a mechanic relies on a sales brochure instead of approved data for a major repair, the consequence is that the:

A. Repair is completed faster and approved

B. Brochure becomes approved data

C. Repair lacks the required FAA-approved basis

D. Aircraft gains an extended inspection interval

35. If a flexible hose is installed with a twist, shown by a spiraled lay line, the consequence is that the hose:

A. Flows fluid more efficiently

B. Lasts longer than a straight hose

C. Reads its pressure rating more clearly

D. Is stressed and prone to early failure

36. If a mechanic charges an oleo strut with moist shop air instead of dry nitrogen, the likely result is:

A. A lighter, more responsive strut

B. Improved sealing of the strut

C. Internal corrosion and pressure changes from moisture

D. A permanent increase in strut travel

37. If a cotter pin is omitted from a castellated nut on a critical bolt, the consequence is that the:

A. Nut may loosen with no positive safetying

B. Joint becomes permanently locked

C. Bolt gains tensile strength

D. Torque value increases automatically

38. If a mechanic adds a 50-lb item far aft of the CG, the effect on the center of gravity is that it:

A. Moves aft

B. Moves forward

C. Stays exactly the same

D. Drops to zero

39. If liquid penetrant inspection is used to find a fully internal (subsurface) flaw, the result is that the flaw:

A. Is clearly revealed by the penetrant

B. Causes the dye to glow brighter

C. Is not detected because penetrant reaches only surface flaws

D. Magnetizes the surrounding metal

40. If a mechanic leaves a tool inside an aircraft after a job, the danger is:

A. A minor cosmetic blemish only

B. Foreign object damage to the aircraft

C. An automatic logbook correction

D. Improved weight distribution

41. If a conversion coating is skipped before priming a cleaned aluminum surface, the likely result is:

A. Stronger structural integrity of the panel

B. Faster curing of the topcoat

C. Reduced corrosion protection and weaker paint adhesion

D. A heavier finished surface

42. If a candidate answers 38 questions correctly on a 60-question exam with a 70% passing standard, the outcome is:

A. A failing score, four below the 42 needed

B. A passing score with margin to spare

C. Exactly the passing threshold

D. One question above passing

43. If a mechanic mixes a two-part sealant in the wrong ratio, the consequence is that the sealant:

A. Cures faster and stronger

B. Gains corrosion resistance

C. Fails to cure or perform properly

D. Changes color but works normally

44. If an aircraft is returned to service after an equipment change without updating the weight-and-balance record, the danger is that the:

A. Datum location shifts permanently

B. Actual CG may be outside limits unknowingly

C. Empty weight is automatically corrected

D. Useful load increases on paper

45. If a mechanic applies primer directly over visible corrosion, the consequence is that the corrosion:

A. Is permanently neutralized

B. Converts into a protective coating

C. Strengthens the underlying metal

D. Continues to spread beneath the finish

46. If too little torque is applied to a critical fastener, the likely result is that the:

A. Fastener cracks from overstress

B. Joint loosens in service

C. Threads strip immediately

D. Bolt elongates permanently

47. If a mechanic uses the radius incorrectly as the diameter in the πr^2 area formula, the computed area will be:

A. Exactly correct

B. Half the true value

C. Four times the true value

D. Unchanged by the error

48. If an inductor is placed in a DC circuit and the current is suddenly changed, the inductor will:

A. Allow current in one direction only

B. Store energy in an electrostatic field

C. Oppose the change in current

D. Convert the current to AC

49. If a mechanic fails to clean a surface before inspecting it, the likely consequence is that:

A. The inspection is completed faster

B. Defects hidden by dirt go undetected

C. The surface gains corrosion resistance

D. The part is automatically airworthy

50. If a 24-volt circuit draws 8 amps, the power consumed is:

A. 3 watts

B. 0.33 watts

C. 32 watts

D. 192 watts

51. If a mechanic substitutes a 45-degree automotive flare on an aircraft 37-degree fitting, the result is that the connection:

A. Fails to seal properly and leaks under pressure

B. Seals more tightly than the correct flare

C. Becomes interchangeable with either angle

D. Requires no nut or sleeve

52. If a part shows reddish-brown flaking corrosion, the mechanic should conclude the metal is:

A. Iron or steel, corroding as rust

B. Aluminum, corroding white

C. Copper, corroding green

D. Magnesium, corroding gray

53. If a mechanic skips independent verification of critical flight-control rigging, the danger is that:

A. The rigging is automatically correct

B. The job finishes with no possible error

C. A single person's error may go uncaught

D. The controls gain redundancy

54. If an aircraft's empty weight increases after equipment is added, the effect on useful load (at a fixed gross weight) is that it:

A. Decreases by the added weight

B. Increases by the added weight

C. Stays exactly the same

D. Drops to zero

55. If a mechanic exceeds the manufacturer's depth limit when blending out corrosion, the part becomes:

A. More fatigue-resistant

B. Structurally weakened and unairworthy

C. Better protected against future corrosion

D. Lighter without any drawback

56. If exfoliation corrosion is left untreated, the consequence is that it:

A. Heals itself over time

B. Remains a harmless surface stain

C. Converts to a protective layer

D. Progresses, lifting the metal into weakening layers

57. If a mechanic uses water to extinguish a burning aviation-fuel (Class B) fire, the result is that the:

A. Burning fuel spreads and the fire worsens

B. Fire is immediately extinguished

C. Fuel is converted to a non-flammable state

D. Water increases the fuel's flash point

58. If a diode is installed backward in a rectifier circuit, the result is that it:

A. Blocks the current it was meant to pass

B. Stores energy in a magnetic field

C. Doubles the circuit voltage

D. Converts DC to mechanical motion

59. If a mechanic anodizes an aluminum part, the effect on the surface is that it:

A. Adds a coat of paint over the metal

B. Thickens the oxide layer for corrosion resistance

C. Makes the aluminum ferromagnetic

D. Reduces the part's corrosion resistance

60. If a mechanic fails to convert foot-pounds to inch-pounds before setting an inch-pound torque wrench, the likely result is:

A. The fastener is torqued correctly anyway

B. The applied torque is far too low, under-tightening the fastener

C. The wrench self-corrects the units

D. The fastener is over-torqued and cracks

Answer Key

1. D — Wiring can overheat without the breaker tripping. A breaker rated above the wire's safe capacity no longer opens before the wire overheats, defeating the protection. This is why a breaker must never be upsized to stop nuisance tripping.

2. B — The hose contracts and stresses the end fittings. Flexible hose shortens in length when pressurized, so a straight, tight installation places damaging tension on the fittings. A slight installed bend prevents this.

3. C — Embedded steel particles create new galvanic corrosion. A steel wire brush leaves steel particles embedded in the aluminum, and those dissimilar-metal particles form galvanic cells that corrode the surface. Aluminum must be cleaned only with compatible abrasives.

4. A — Arm measurements are invalid and the CG is inaccurate. Arms are valid only when the aircraft is level in both axes, so weighing un-leveled produces invalid arms and an inaccurate CG. Leveling is a prerequisite to accurate weighing.

5. D — A spontaneous and violent ignition. Oil in contact with high-pressure oxygen can ignite spontaneously and violently, which is why oxygen systems must be kept free of petroleum products. This ignition hazard is the central reason for cleanliness.

6. B — The burr restricts flow and may break loose to contaminate the system. An internal burr left after cutting restricts flow and can break free to contaminate the system, so the tube is deburred inside before flaring. The outside is also deburred for a proper flare.

7. A — The insert degrades and loses its locking ability. A fiber-insert nut has a temperature limitation, and high heat degrades the insert and reduces its locking ability. A metal self-locking nut is used where heat would damage a fiber insert.

8. C — Is unairworthy until the AD is complied with. An applicable uncomplied AD makes the aircraft unairworthy regardless of inspection status. Compliance must be accomplished and documented before further flight as required.

9. D — All current flow stops. A series circuit has a single path, so an open at any component stops all current flow. This is the defining behavior of series wiring.

10. D — Galvanic corrosion of the more active metal. Two dissimilar metals in contact with an electrolyte form a galvanic cell that corrodes the more active metal. Isolating them with a barrier prevents this.

11. C — The fastener is overstressed and may fail. Too much torque overstresses the fastener and can cause it to fail, while too little allows the joint to loosen. The specified value balances security against fastener damage.

12. A — The wire permits the fastener to loosen. Safety wire installed so loosening slackens it permits the fastener to loosen, defeating its purpose. It must be routed so any loosening tendency tightens the wire.

13. B — Grossly incorrect. The gas laws require absolute temperature (Rankine or Kelvin), so using Celsius produces grossly incorrect results. Absolute temperature is measured from absolute zero, which the laws assume.

14. C — Reduced stability and possible loss of control. A CG aft of the rear limit makes the aircraft tail-heavy, reducing stability and risking loss of control. A CG too far forward produces the opposite — nose-heaviness.

15. B — The paint fails to adhere and corrosion forms underneath. Paint over a greasy, contaminated surface will not adhere and lets corrosion start beneath the finish. A finish is only as good as the surface preparation beneath it.

16. D — Engine failure. Using jet fuel in a piston engine can cause engine failure, which is why fuel grade is verified by placard and color. Piston engines run only on aviation gasoline.

17. D — Remove protection and allow the wire to overheat. Replacing a properly rated fuse with a higher-rated one removes the protection and can let the wire overheat. Repeated opening signals a fault to find, not a rating to raise.

18. C — Is no longer in compliance and cannot be operated for hire. Exceeding the 100-hour interval beyond the allowed 10-hour overage puts the aircraft out of compliance, so it cannot be operated for hire until inspected. The 10-hour allowance exists only to reach an inspection facility.

19. B — Unairworthy and must be repaired or replaced. Removing metal beyond the structural limit thins the part below its allowable strength, making it unairworthy. Coating or repainting does not restore lost material.

20. D — The empty weight is recorded too high. Failing to subtract tare weight (chocks and blocks on the scale) inflates the recorded empty weight. Tare must always be subtracted to find the true weight.

21. B — One load failing open would shut off all the others. In series, a single open stops all current, so one failed load would shut off the others. This is exactly why aircraft loads are wired in parallel instead.

22. B — Incorrect, because the screw is non-structural. Self-tapping screws are intended for non-structural attachment, so using one on a primary structural fitting is incorrect. A structural fitting requires structural hardware.

23. A — The seals swell or dissolve and the system is damaged. Mineral (MIL-H-5606) and phosphate-ester (Skydrol) fluids are incompatible, so mixing them swells or dissolves the seals and damages the system. Each system must use only its specified fluid.

24. D — Not airworthy until the overweight is corrected. Exceeding maximum gross weight makes the aircraft unairworthy even with an acceptable CG. Both the weight and CG limits must independently pass.

25. D — A step may be skipped and a defect introduced. Resuming after a distraction without re-verifying can cause a step to be skipped, introducing a defect. The discipline is to return to a known-good point and re-check.

26. C — No useful indication is produced. Magnetic particle inspection requires a ferromagnetic material, so on non-magnetic aluminum it produces no useful indication. Aluminum requires other NDI methods such as penetrant.

27. B — Static electricity may ignite fuel vapors. Fuel flow generates static charge, so fueling without bonding and grounding risks a spark igniting fuel vapors. Bonding and grounding dissipate the charge safely.

28. D — 4 ohms. Two equal 8-ohm resistors in parallel give half the value: 8 ÷ 2 = 4 ohms. Total parallel resistance is always less than the smallest branch.

29. A — Excessively brittle and prone to cracking. Hardening increases brittleness, so a hardened part not subsequently tempered remains excessively brittle and prone to cracking. Tempering reduces that brittleness and restores toughness.

30. A — The return-to-service approval is incomplete and invalid. A maintenance entry must include the signer's certificate number, so omitting it makes the approval incomplete and invalid. The entry is a legal certification with required elements.

31. D — Damage to the nose-gear steering mechanism. Exceeding the nose-gear steering limit while towing can damage the steering mechanism. Towing must stay within the published steering limits.

32. C — Accelerated corrosion of nearby metal. Spilled electrolyte left in the battery box, combined with moisture, aggressively corrodes nearby metal. This is why battery boxes are corrosion hot spots requiring prompt cleanup.

33. A — Airflow separates and lift drops abruptly. Beyond the critical angle of attack, airflow separates from the wing's upper surface and lift drops abruptly — a stall. Lift increases with angle of attack only up to that point.

34. C — The repair lacks the required FAA-approved basis. A major repair must use FAA-approved data, so relying on a sales brochure leaves the repair without the required approved basis. Approved data is mandatory for major work.

35. D — Is stressed and prone to early failure. A spiraled lay line shows an installed twist, which stresses the hose and makes it prone to early failure. It must be reinstalled without the twist.

36. C — Internal corrosion and pressure changes from moisture. Charging a strut with moist shop air introduces moisture that causes internal corrosion and pressure swings. Dry nitrogen, being inert and moisture-free, is used instead.

37. A — The nut may loosen with no positive safetying. Omitting the cotter pin from a castellated nut leaves it without positive safetying, so it may loosen. The cotter pin through the drilled bolt is what locks it.

38. A — Moves aft. Adding weight aft of the CG increases the aft moment, so the center of gravity moves aft. The direction of a CG shift follows the location of the added weight.

39. C — Is not detected because penetrant reaches only surface flaws. Liquid penetrant detects only surface-breaking flaws, so a fully internal flaw is not detected because the penetrant cannot reach it. Subsurface flaws require ultrasonic or radiographic methods.

40. B — Foreign object damage to the aircraft. A tool left in the aircraft can cause foreign object damage, which is why every tool is accounted for before and after a job. Tool control is a key error-prevention safeguard.

41. C — Reduced corrosion protection and weaker paint adhesion. Skipping the conversion coating before priming leaves the aluminum with less corrosion protection and weaker paint adhesion. The coating inhibits corrosion and improves adhesion.

42. A — A failing score, four below the 42 needed. A 70% standard on 60 questions requires 42 correct, so 38 correct fails by four. The candidate did not reach the passing threshold.

43. C — Fails to cure or perform properly. A two-part sealant mixed in the wrong ratio fails to cure or perform properly, because the chemistry depends on the specified ratio. The manufacturer's ratio must be followed.

44. B — The actual CG may be outside limits unknowingly. Returning to service after an equipment change without updating the record means the actual CG may be outside limits without anyone knowing. The record must be recomputed and updated.

45. D — Continues to spread beneath the finish. Applying primer over visible corrosion seals it in, and the corrosion continues to spread beneath the finish. Corrosion must be removed and treated before refinishing.

46. B — The joint loosens in service. Too little torque leaves the joint under-clamped, so it loosens in service. The specified value provides enough clamp-up without overstressing the fastener.

47. C — Four times the true value. Using the diameter (2r) in place of the radius in πr^2 gives $\pi(2r)^2 = 4\pi r^2$, four times the true area. Only the radius belongs in the πr^2 formula.

48. C — Oppose the change in current. An inductor stores energy in a magnetic field and opposes a change in current, so a sudden current change is resisted. A capacitor, by contrast, opposes a change in voltage.

49. B — Defects hidden by dirt go undetected. Failing to clean a surface before inspection lets dirt and old finish hide defects, which then go undetected. A clean surface is a prerequisite to effective inspection.

50. D — 192 watts. Power equals voltage times current: $P = E \times I = 24 \times 8 = 192$ watts. This base formula gives the electrical load directly.

51. A — Fails to seal properly and leaks under pressure. A 45-degree automotive flare will not seat correctly on a 37-degree aircraft fitting, so it leaks under pressure. The two flare angles are not interchangeable.

52. A — Iron or steel, corroding as rust. Reddish-brown flaking is the corrosion product of iron and steel — rust. Identifying the metal from its corrosion product guides correct treatment.

53. C — A single person's error may go uncaught. Skipping independent verification of critical flight-control rigging means a single mechanic's error may go uncaught. The second set of eyes is a key error-prevention safeguard.

54. A — Decreases by the added weight. At a fixed maximum gross weight, increasing the empty weight reduces the useful load by that same amount, since useful load is gross minus empty. Added equipment directly trades against payload capacity.

55. B — Structurally weakened and unairworthy. Exceeding the manufacturer's depth limit when blending corrosion removes too much metal, structurally weakening the part and making it unairworthy. The depth removed must be checked against the limits.

56. D — Progresses, lifting the metal into weakening layers. Exfoliation is an advanced intergranular corrosion that progresses by lifting the metal into layers, weakening the structure. It does not heal or remain a harmless stain.

57. A — The burning fuel spreads and the fire worsens. Water on a Class B fuel fire spreads the burning fuel and worsens the fire. Class B fires require CO_2, dry chemical, or foam instead.

58. A — Blocks the current it was meant to pass. A diode installed backward blocks the current it was meant to pass, because it conducts in only one direction. Correct orientation is essential for rectification.

59. B — Thickens the oxide layer for corrosion resistance. Anodizing is an electrochemical process that thickens the natural oxide layer on aluminum for corrosion resistance. It treats the metal itself rather than coating it with paint.

60. B — The applied torque is far too low, under-tightening the fastener. Setting a foot-pound number on an inch-pound wrench applies only one-twelfth of the intended torque, far too low and under-tightening the fastener. Units must be converted before setting the wrench.