

PRACTICE EXAM 18: HAZMAT & TANKER SIMULATION (50 QUESTIONS)

HAZMAT SECTION (Questions 1–30)

1. A driver is reviewing a shipping paper that lists a hazardous material as "Corrosive liquid, basic, organic, n.o.s. (tetraethylammonium hydroxide), 8, UN3267, PG II, 4,000 lbs." The shipper has highlighted this entry in yellow to distinguish it from nonhazardous items on the same document. The driver also notices the letters "X" in Column 1 of the shipping paper table. What does the "X" in Column 1 indicate?

- A. The "X" marks the entry for immediate disposal at the next licensed hazardous waste facility along the route
- B. The "X" indicates the material has failed quality testing and must be returned to the manufacturer within 48 hours
- C. The "X" is another accepted method for identifying hazardous material entries on shipping papers — it distinguishes the HazMat entry from nonhazardous entries, similar to the yellow highlighting
- D. The "X" indicates the material is exempt from all placarding requirements because the shipper has preapproved a waiver

2. A driver transporting placarded hazardous materials parks at a truck stop for a mandatory rest break. While the driver is inside the truck stop (within 100 feet, vehicle in clear view), another truck parks directly next to the HazMat vehicle — so close that the placards on the driver's side are completely blocked from view by the adjacent truck. Is this a concern?

- A. Yes, the placards must be visible from all four sides at all times — the driver should reposition one of the vehicles or ask the adjacent truck to move so that all placards remain visible to approaching emergency responders
- B. No, because the attendance requirement is satisfied as long as the driver is within 100 feet, regardless of placard visibility

C. Yes, but only if the adjacent truck is also carrying hazardous materials, which would create a dualHazMat parking violation

D. No, because parked vehicles are exempt from the foursided placard visibility requirement until they resume driving

3. Under the Hazardous Materials Regulations, a driver discovers that a package of hazardous material offered for transport bears a marking showing it was packaged according to a DOT specification that has been withdrawn and is no longer valid. The shipping papers reference the current specification. What should the driver do?

A. Accept the package because the shipping papers reference the current specification, which supersedes any outdated markings on the package

B. Apply a sticker over the outdated specification marking showing the current specification number before loading the package

C. Accept the package but make a handwritten note on the shipping papers indicating the packaging discrepancy for future reference

D. Refuse the package until the shipper resolves the discrepancy — a package marked with a withdrawn specification may not meet current safety standards

4. A driver transporting 1,800 pounds of Division 5.1 Oxidizer is asked to also pick up 600 pounds of Division 4.1 Flammable Solid at a second facility. The driver checks the segregation table and finds these classes may be loaded together with separation. After loading both, what placards must be displayed?

A. Only OXIDIZER placards, because Division 5.1 exceeds 1,001 pounds and is the heavier material on the vehicle

B. OXIDIZER placards for the Division 5.1 exceeding 1,001 pounds — the Division 4.1 at 600 pounds does not independently reach the threshold, but the combined total of 2,400 pounds also allows the driver to display individual class placards for both if preferred

C. DANGEROUS placards only, because two different hazard classes are present regardless of their individual weights

D. Both OXIDIZER and FLAMMABLE SOLID placards are always required whenever these two classes appear on the same vehicle

5. A driver is transporting a load of Class 3 Flammable Liquid in drums. During a mandatory enroute inspection, the driver opens the trailer doors and smells a faint chemical odor but sees no visible leaks, drips, or wet spots on any package. The odor is mild and dissipates quickly after the doors are opened. Should the driver be concerned?

A. No, because the absence of visible liquid confirms no leak has occurred and the odor is residual vapors from loading operations

B. No, because all Class 3 materials produce noticeable odors during transport and this is an expected characteristic of the cargo

C. Yes, even a faint chemical odor warrants attention — the driver should investigate further by carefully checking packages for dampness, damaged seals, or stressed containers that may have a slow or intermittent leak

D. Yes, but only if the odor persists for more than 10 minutes after the doors are opened — quick dissipation confirms the odor is harmless

6. A vehicle is carrying 200 pounds of Division 2.3 Poison Gas (Table 1) and 900 pounds of Division 2.2 NonFlammable Gas (Table 2). What placards must be displayed?

A. POISON GAS placards for the Table 1 material at any quantity — the Division 2.2 at 900 pounds does not independently reach the 1,001pound Table 2 threshold, so no NONFLAMMABLE GAS placard is required

B. Both POISON GAS and NONFLAMMABLE GAS placards, because both divisions of Class 2 are represented on the vehicle

C. NONFLAMMABLE GAS placards only, because Division 2.2 has the greater weight and takes priority in Class 2 combinations

D. DANGEROUS placards, because two different divisions of the same class are present on the vehicle

7. A driver transporting hazardous materials is driving through a rural area at night when the headlights illuminate a large fallen tree completely blocking the roadway. The driver stops safely. The tree cannot be driven around or over. What should the driver do while waiting for the road to be cleared?

A. Shut off the engine immediately because idling near downed trees creates a fire hazard from the engine's exhaust heat

B. Exit the vehicle and attempt to move the tree using the tractor's tow chain to clear the roadway for the HazMat vehicle

C. Make a Uturn immediately and take an alternate route, regardless of whether the alternate route has been evaluated for HazMat compliance

D. Activate hazard flashers, set out reflective triangles behind the vehicle, remain with the vehicle, and call for assistance — ensure the vehicle is visible to approaching traffic and monitor conditions while waiting

8. A driver is at a shipper's facility when the dock supervisor says, "We've got a small package of Division 6.2 Infectious Substance going to the same place as your other load. Can you take it?" The driver's current load is Class 3 Flammable Liquid. The driver checks the segregation table and finds no specific prohibition against loading these two classes together. Should the driver accept the infectious substance package?

A. Yes, because the segregation table shows no prohibition and the infectious substance package is small

B. The driver should accept it only if proper segregation can be maintained and the driver understands the specific handling requirements for Division 6.2 — infectious substances require specialized knowledge about packaging integrity, spill response, and personal protection that differs significantly from Class 3 procedures

C. No, because Division 6.2 materials may never be transported on the same vehicle with any other hazard class

D. Yes, without conditions, because small packages of Division 6.2 are exempt from all segregation and handling requirements

9. A driver reviews shipping papers and notices that one hazardous material entry shows "PG I" while all other entries show "PG II" or "PG III." The driver knows that PG I indicates the greatest degree of danger. What practical significance does this PG I designation have for the driver?

A. PG I is a billing code that increases the shipping cost by 50 percent compared to PG II and PG III materials

B. PG I requires the driver to wear a full hazmat suit during all phases of transport, including driving the vehicle on public highways

C. PG I materials require the driver to follow a specific DOT-approved route that avoids all areas with populations greater than 500 people

D. PG I indicates the driver should exercise heightened awareness — this material is the most dangerous version of its class, with more aggressive protective packaging, stricter handling rules, and greater consequences in the event of a release

10. A driver is transporting placarded hazardous materials when the vehicle develops a hydraulic brake fluid leak. The driver notices the brake pedal is getting softer with each application. The vehicle can still be stopped, but braking effectiveness is clearly diminishing. What should the driver do?

A. Pull over at the nearest safe location immediately — continuing to drive with a deteriorating brake system while carrying hazardous materials risks a total brake failure and loss of vehicle control

B. Continue to the next truck stop where a mechanic can evaluate the brake system in a safe, controlled environment

C. Increase following distance and reduce speed by 10 mph to compensate for the reduced braking effectiveness

D. Pump the brake pedal rapidly to build up residual pressure in the hydraulic system and restore full braking force

11. A driver picks up a shipment of hazardous materials at a chemical plant. The shipper certifies that all packages are properly prepared. During loading, the driver notices one drum has a label showing a skull and crossbones symbol (Division 6.1 Toxic) but the shipping papers list the material as Class 3 Flammable Liquid only, with no subsidiary hazard. What should the driver do?

A. Accept the drum because the label might be a remnant from a previous use of the drum before it was cleaned and repurposed

B. Bring the discrepancy to the shipper's attention — either the label is wrong and should be replaced, or the shipping papers are incomplete and should be updated to reflect the toxic subsidiary hazard

C. Remove the skull and crossbones label from the drum since it contradicts the shipping papers, which are the authoritative document

D. Accept the drum and add POISON placards to the vehicle as a precaution without modifying the shipping papers

12. Under the Hazardous Materials Regulations, what is required when a hazardous material has been involved in a highway accident where no material was released, no one was injured, but property damage exceeds \$50,000?

A. No action is required because the mandatory reporting triggers only apply when hazardous material is actually released

B. Only a written DOT Form 5800.1 is required within 30 days — the immediate NRC telephone notification is waived for nonrelease incidents

C. The incident must be reported to the shipper within 72 hours, but no federal notification is required

D. Immediate telephone notification to the National Response Center is required because property damage exceeding \$50,000 is one of the mandatory NRC reporting triggers, even without a release of material

13. A driver is transporting a load of Division 2.1 Flammable Gas in compressed cylinders. The driver's route passes through a highway tunnel. No HazMat restriction signs are posted at the tunnel entrance. However, the driver remembers from training that some tunnels restrict flammable gases even without signs. What should the driver do?

A. The driver should proceed through the tunnel since no restrictions are posted, but should be aware that a flammable gas release inside a tunnel would be extremely dangerous — if an alternate surface route is reasonably available, it may be the more prudent choice

B. Contact the FMCSA to request a tunnelspecific routing permit before proceeding through any tunnel with Division 2.1 cargo

C. Stop before the tunnel entrance and wait for another truck to pass through first to confirm the tunnel is safe for HazMat vehicles

D. Remove the placards before entering the tunnel and reapply them after exiting, to avoid triggering any automated tunnel sensors

14. A vehicle is loaded with 1,200 pounds of Class 3 Flammable Liquid and 1,500 pounds of Class 8 Corrosive. Both are Table 2 materials. Both exceed the 1,001 pound threshold independently. What placards must be displayed?

A. DANGEROUS placards only, because the DANGEROUS placard can substitute for individual class placards when two or more Table 2 classes each exceed 1,001 pounds

B. Only CORROSIVE placards, because Class 8 has the higher weight and takes priority in mixed loads

C. Both FLAMMABLE and CORROSIVE placards on all four sides — when individual Table 2 materials each independently exceed the 1,001 pound threshold, each requires its own class-specific placard

D. Either FLAMMABLE or CORROSIVE placards at the driver's discretion, because only one class-specific placard is required when two Table 2 classes are present

15. A driver is transporting hazardous materials on a highway when a thunderstorm produces heavy rain. Visibility drops significantly and the road becomes wet. The driver is hauling a dry van trailer with packaged HazMat. What is the most important driving adjustment?

A. Reduce speed to match visibility and road conditions — wet pavement increases stopping distances, and reduced visibility means the driver may have less time to react to hazards ahead, both of which are amplified by the consequences of a HazMat collision

B. Increase speed to pass through the rain band as quickly as possible and return to dry pavement

C. Activate the vehicle's fourway hazard flashers and maintain current speed to remain visible to other motorists

D. Move to the left lane where the road crowning sheds water faster, providing better traction than the right lane

16. A driver is at a loading dock when the shipper presents packages that appear to have been repackaged — the outer packaging shows signs of having been opened, resealed with different tape, and relabeled with new labels placed over partially visible old labels. The shipping papers appear correct. Should the driver be concerned?

A. No, because repackaging is a routine quality control procedure and the new labels indicate the material has been properly reclassified

B. No, because the shipping papers are the authoritative document and override any visual concerns about packaging condition

C. Yes, but only if the repackaging was performed by someone other than the original manufacturer — shipperperformed repackaging is always acceptable

D. Yes, repackaged materials with coveredover labels raise questions about whether the current labeling and classification are correct — the driver should request clarification from the shipper about the repackaging before accepting

17. A driver transporting Division 1.3 Explosives (Table 1) is following a route plan provided by the carrier. The route plan directs the driver to a specific safe haven facility for overnight parking. When the driver arrives at the safe haven, it is closed — the gate is locked and no attendant is present. What should the driver do?

A. Park on the road directly outside the safe haven's gate and wait for it to open in the morning

B. Contact the carrier immediately to arrange an alternative safe haven or secure parking location — the driver cannot park a vehicle loaded with Division 1.3 Explosives in an unsecured location overnight

C. Park at the nearest truck stop because any commercial parking facility is equivalent to a safe haven

D. Park on a remote highway shoulder far from any buildings or population and use reflective triangles to mark the vehicle

18. A driver transporting hazardous materials stops at a rest area and discovers a small puddle of unidentified liquid beneath the trailer. The liquid has no color and no obvious odor. The driver is not sure whether the liquid is water (from air conditioning condensation or rain), hydraulic fluid, or a leak from the cargo. What should the driver do?

A. Taste a small amount of the liquid to determine whether it is water, since water is the most common source of puddles under trailers

B. Ignore the puddle because small amounts of liquid under a trailer are always condensation and never indicate a cargo issue

C. Investigate the source of the liquid — check the air conditioning drain, look for hydraulic fluid leaks, and inspect the cargo area for any signs of package damage or leakage — treat any unidentified liquid as potentially hazardous until its source is confirmed

D. Assume the liquid is from a neighboring vehicle that was previously parked in the same space and disregard it

19. A vehicle is carrying 500 pounds of Division 4.3 Dangerous When Wet (Table 1) and 800 pounds of Division 5.1 Oxidizer (Table 2). What placards must be displayed?

A. DANGEROUS WHEN WET placards for the Table 1 material at any quantity — the Division 5.1 at 800 pounds does not independently reach the 1,001-pound Table 2 threshold, so no OXIDIZER placard is required

B. Both DANGEROUS WHEN WET and OXIDIZER placards, because both materials must be placarded when carried together

C. OXIDIZER placards only, because Division 5.1 has the greater weight and is the more common industrial material

D. DANGEROUS placards, which serve as a universal substitute for both class-specific placards in all mixed-load situations

20. A driver picks up a hazardous waste shipment. The Uniform Hazardous Waste Manifest lists the driver's name as the transporter. Before departing, the driver signs the manifest. After delivery to the designated disposal facility, the facility manager signs the manifest and returns one copy to the driver. What must the driver do with this returned copy?

A. Destroy the returned copy by shredding it within 24 hours, because retaining hazardous waste documentation creates liability

B. Mail the returned copy to the EPA regional office within 10 days as part of the federal manifest tracking system

C. File the returned copy in the driver's personal records and retain it for 7 years as proof of proper delivery

D. Deliver the returned copy to the carrier, who must retain it for at least 3 years as part of the chain-of-custody documentation

21. A driver transporting Class 3 Flammable Liquid in a cargo tank is making a delivery. During unloading, the customer's employee lights a cigarette approximately 40 feet from the cargo tank. What should the driver do?

A. Continue unloading because 40 feet exceeds the 25-foot no-smoking zone for the driver's own vehicle

B. Immediately stop the unloading operation and ask the person to extinguish the cigarette — a lit cigarette within the general vicinity of a flammable liquid transfer operation creates an ignition risk from vapors that may travel well beyond the 25-foot zone

C. Call law enforcement to cite the employee for violating federal no-smoking regulations near a placarded vehicle

D. Ignore the cigarette because the no-smoking rule applies only to the driver and not to other people at the delivery site

22. A driver is assigned a load of hazardous materials. The carrier's dispatcher provides the route and instructs the driver to follow a specific highway that has recently been designated as a preferred HazMat route by the state DOT. What is the purpose of preferred HazMat routes?

A. Preferred routes are scenic routes designated to improve the driving experience for HazMat drivers during long-haul trips

B. Preferred routes direct HazMat vehicles away from incompatible military installations that could be damaged by a HazMat release

C. Preferred routes are temporary seasonal designations that change monthly based on weather patterns in each state

D. Preferred routes are designated highways that balance transportation efficiency with public safety by directing HazMat vehicles away from densely populated areas, sensitive environmental zones, and high-risk infrastructure

23. A driver is reviewing the shipping papers for a mixed load. One entry shows an "X" in Column 1 and the entry is printed in a contrasting color (red ink on white paper). The remaining entries are in standard black ink with no "X" marking. What do both the "X" and the contrasting color indicate?

A. The "X" indicates the material is expired and the red ink indicates urgent disposal is required within 24 hours

B. The "X" marks a priority delivery item and the red ink indicates the material is subject to a price premium

C. Both are accepted methods for distinguishing hazardous material entries from nonhazardous entries on the same shipping paper — using two methods simultaneously is redundant but not a violation

D. The "X" indicates the material requires an armed escort and the red ink indicates the shipment has been flagged by the TSA

24. A driver is transporting 3,000 pounds of Class 8 Corrosive in a DOT 407 cargo tank. During a rest stop, the driver checks the shipping papers and notices that the entry includes "Poison Inhalation Hazard, Zone C" after the basic description. What does Zone C indicate about this corrosive material?

A. Zone C indicates the material is toxic by inhalation at moderate concentrations — while less acutely lethal than Zone A or Zone B, it still presents serious respiratory danger and triggers specific placarding and handling requirements

B. Zone C indicates the material must be stored in Climate Zone C (temperate regions) during transport and cannot be hauled through tropical or arctic zones

C. Zone C indicates the third compartment of the cargo tank must be used exclusively for this material, separating it from other products

D. Zone C indicates the material's corrosive effect is limited to a specific category of metals and does not affect human tissue

25. A driver receives a phone call from a journalist asking about the driver's experience transporting hazardous materials. The journalist wants to know what types of materials the driver typically hauls, what routes are commonly used, and what security procedures are in place. What should the driver do?

A. Answer all questions honestly because the press has a constitutional right to information about commercial transportation

B. Provide general information about the trucking industry but decline to share any specifics about the driver's own operations

C. Refer the journalist to the carrier's public relations or communications department for any media inquiries

D. Decline to share specific operational details including cargo types, routing, and security procedures — this information could compromise the security of current and future shipments, and media inquiries should be directed to the carrier's communications department

26. A driver is loading a flatbed trailer with hazardous materials packages. The weather forecast calls for rain beginning in approximately two hours. The packages are not watersensitive — they are Class 3 Flammable Liquid in sealed metal drums. Must the driver cover the packages with a tarp? A. Yes, because all hazardous materials on flatbed trailers must be covered with tarps regardless of weather conditions or package type

B. While sealed metal drums are weatherresistant, covering them with a tarp is good practice to protect labels and markings from degradation, prevent water accumulation around closures, and maintain professional presentation

C. No, because sealed metal drums are completely impervious to all weather conditions including rain, snow, and ice

D. Yes, but only if the drums contain Packing Group I material — PG II and PG III drums in sealed metal containers require no weather protection

27. A driver transporting a mixed load of hazardous materials is making a multistop delivery. After the second delivery, the driver removes the last of the Class 3 Flammable Liquid from the trailer. The remaining load is 500 pounds of Division 5.1 Oxidizer and 700 pounds of Class 8 Corrosive — both Table 2 materials. Neither individually reaches 1,001 pounds. What placard changes are needed?

A. Remove the FLAMMABLE placards — the remaining materials' combined total of 1,200 pounds exceeds 1,001, allowing DANGEROUS placards for the two Table 2 classes since neither independently reaches the threshold

B. Remove all placards because neither remaining class individually reaches 1,001 pounds

C. Keep the FLAMMABLE placards because the trailer previously carried flammable material and may contain residual vapors

D. Display all three classspecific placards to account for the previous flammable load and the current oxidizer and corrosive loads

28. A driver transporting Division 1.1 Explosives encounters a highway detour that routes traffic through a residential neighborhood. No other detour is available. While driving through the neighborhood, a group of children playing near the road runs toward the street chasing a ball. What is the driver's most immediate priority?

A. Sound the vehicle's horn continuously to warn the children of the hazardous materials on board the vehicle

B. Accelerate past the children to reduce the time the explosives are near them, because speed is the best protection

C. Stop the vehicle, exit the cab, and physically restrain the children until they can be returned to their parents

D. Stop the vehicle safely and wait for the children to clear the area before proceeding — the immediate priority is preventing a collision, which with Division 1.1 Explosives could be catastrophic for the entire neighborhood

29. A driver is transporting hazardous materials when the vehicle's ABS warning light illuminates on the dashboard. The base brakes appear to function normally during a gentle test application. What should the driver know about this situation?

- A. The ABS warning light means the brakes have completely failed and the driver must stop the vehicle using the parking brake
- B. The base brakes still function without ABS, but the driver has lost the antilock protection that prevents wheel lockup during hard braking — this is especially significant for HazMat vehicles where maintaining directional control during emergency stops is critical
- C. ABS warning lights are informational only and never indicate an actual problem with any component of the braking system
- D. The ABS warning light indicates the vehicle must be immediately removed from HazMat service until the system is repaired

30. A driver transporting Class 7 Radioactive material in a dry van trailer is making a delivery to a medical facility. The facility's receiving dock is located adjacent to a pediatric waiting room with large windows facing the dock. The delivery will take approximately 15 minutes. What should the driver consider about this delivery location?

- A. The driver should refuse the delivery because radioactive materials may never be brought within 500 feet of a pediatric care facility
- B. The driver should increase the delivery speed to minimize the total time the radioactive packages are near the waiting room
- C. The driver should consider the radiation exposure implications — while the packages are designed to limit radiation, the proximity of children (who are more sensitive to radiation) warrants verification that the delivery can be completed within safe exposure parameters
- D. No special consideration is needed because the trailer walls provide complete radiation shielding that eliminates all exposure

TANKER SECTION (Questions 31–50)

31. A tank vehicle driver is hauling a full load of liquid in a smooth bore tank at 55 mph on a straight highway. Without warning, the vehicle ahead drops a large piece of cargo into the travel lane approximately 300 feet ahead. The debris is too large to drive over safely. The driver must choose between hard braking and swerving. Which response generally presents lower overall risk in a loaded smooth bore tank?

A. Hard braking — while stopping distance will be extended by forward surge, the vehicle remains in its lane and upright, which is generally less catastrophic than a hard swerve at highway speed that risks rollover from lateral surge

B. Swerving — because the lateral liquid shift during a swerve lowers the center of gravity on the inside of the turn, actually stabilizing the vehicle

C. Both options present identical risk because the smooth bore tank converts all surge energy into heat through friction

D. Neither option — the driver should maintain speed and direction, relying on the vehicle's mass to push through the debris

32. A cargo tank driver performing a pretrip inspection discovers that the tank's manhole cover gasket appears compressed and flattened in one section — it no longer springs back to its original shape when pressed. The cover bolts are tight and the gasket appears to seal. Is this a concern?

A. No, because compressed gaskets indicate the cover bolts have been properly torqued to the correct specification

B. No, because gasket compression is a normal aging characteristic and flat gaskets seal better than new puffy ones

C. Yes, a compressed and flattened gasket section has lost its resilience and may not maintain a seal under the vibration, temperature changes, and pressure fluctuations encountered during transport — it should be reported for replacement

D. Yes, but only for pressurized tanks like MC 331 — atmospheric DOT 406 tanks are unaffected by gasket condition

33. A driver operating a loaded baffled tank vehicle is following another vehicle on a highway when the vehicle ahead begins decelerating. The driver applies the brakes smoothly and follows at a safe distance as both vehicles slow from 55 mph to 25 mph through a construction zone. What surge characteristic should the driver expect throughout this extended deceleration?

A. No surge occurs during gradual deceleration because the slow speed change allows the liquid to remain perfectly stationary

B. The liquid in each baffled compartment shifts forward incrementally with each slight speed change — the baffles reduce but do not eliminate forward movement, and the driver should

maintain awareness that the vehicle's effective weight has shifted forward throughout the deceleration

C. The baffles prevent all forward liquid movement during gradual deceleration, eliminating any surge-related stopping distance increase

D. The liquid surges only during the first 5 seconds of braking, then locks in place against the baffles for the remainder of the deceleration

34. A tank vehicle carrying a high-density chemical (specific gravity 2.0) in a DOT 407 cargo tank has been loaded to a volume that keeps the gross vehicle weight within legal limits. Compared to carrying the same volume of water (specific gravity 1.0), how does the high-density liquid affect surge forces?

A. Higher density reduces surge forces because the heavier liquid moves more slowly inside the tank

B. Density has no effect on surge forces — surge depends only on tank geometry and fill percentage, not on the mass of the liquid

C. Higher density reduces the center of gravity because the heavier liquid sits lower inside the cylindrical tank

D. The liquid at specific gravity 2.0 has twice the mass of water at the same volume, producing approximately twice the surge force during braking, acceleration, and turning — the driver must account for this significantly amplified force

35. A loaded tank vehicle is traveling on a highway when the driver encounters a section of road with temporary rumble strips installed across both lanes at a construction zone entrance. What effect do the rumble strips have on the liquid cargo?

A. The rumble strips create rapid vertical jolts that can produce vertical sloshing in the liquid — at high fill levels, these jolts can stress manhole gaskets and fittings, and the driver should reduce speed before crossing the rumble strips

B. Rumble strips have no effect on liquid cargo because the jolts are absorbed entirely by the vehicle's suspension system

C. The rumble strips cause the liquid to surge forward only, with no vertical component, regardless of the vehicle's speed

D. The rumble strips stabilize the liquid by breaking up any existing sloshing motion and forcing the liquid into a settled state

36. A driver is loading a cargo tank at a petroleum terminal. The terminal operator asks the driver whether the tank has been tested and is current on all required inspections. The driver checks the specification plate and finds markings showing "V" followed by a date, "K" followed by a date, and "P" followed by a date. What do these three letter designations represent?

A. These markings indicate the tank's original manufacturing date, first sale date, and delivery date to the current owner

B. "V" stands for vehicle weight, "K" stands for kilowatt rating, and "P" stands for pressure capacity in pounds per square inch

C. "V" stands for external visual inspection, "K" stands for leakage test, and "P" stands for pressure test — each followed by the date the test was performed, confirming the tank's testing currency

D. These letters represent the three different products the tank is certified to carry, with each letter corresponding to a product category

37. A tank vehicle driver is delivering product to a customer's underground tank. During the delivery, the driver monitors the product flow through the sight glass on the cargo tank's discharge manifold. Suddenly, the flow appears to slow significantly despite no change in pump speed. What could this indicate?

A. The pump impeller has cavitated due to vapor intrusion, which temporarily reduces flow rate but corrects itself automatically

B. The sight glass has become clouded with condensation, creating the appearance of reduced flow that is actually an optical illusion

C. The product temperature has dropped, increasing viscosity and naturally reducing flow rate through the delivery hose

D. The customer's underground tank may be approaching capacity, creating backpressure that restricts flow — the driver should stop pumping and verify the remaining tank capacity before continuing to prevent an overfill

38. A loaded tank vehicle is parked at a delivery site on a grade. The driver has set the parking brake and chocked the wheels. During the delivery, the driver notices the vehicle has shifted slightly — approximately 2 inches — against the wheel chocks. What does this indicate?

A. The 2inch shift is within normal tolerances for parking brake systems and does not indicate any problem

B. The parking brake may be slipping on the grade — the driver should verify the chocks are properly positioned, consider adding additional chocks, and report the parking brake condition to the carrier for inspection

C. The shift was caused by liquid surge from the delivery operation, not by any brake or chock issue

D. The vehicle's suspension has settled from the weight reduction during the delivery, creating the appearance of movement

39. A driver operating a partially loaded (50%) smooth bore tank vehicle approaches a long, straight section of highway. The driver sets the cruise control to the speed limit. After several miles, the driver notices the vehicle begins a gentle sidetoside rocking motion that gradually increases. The cruise control is maintaining a steady speed. What is happening?

A. The liquid is entering a sloshing resonance at the speed maintained by the cruise control — the steady speed eliminates the natural speed variations that would normally break the resonance, allowing it to build — the driver should disengage cruise control and gradually reduce speed

B. The cruise control system is malfunctioning and causing the engine to surge, which transfers oscillations through the drivetrain to the cargo

C. The road surface has an imperceptible wave pattern that matches the vehicle's wheelbase, creating a harmonic bounce

D. The tires have developed flat spots from the extended highway driving, causing a rhythmic vibration at the contact patch

40. A cargo tank has been loaded with a product that the driver has hauled many times before. However, today the driver notices that the product appears to have a slightly different color than usual — it is normally clear but today has a faint yellowish tint. The shipping papers list the same product name and specifications as always. Should the driver be concerned?

A. No, because minor color variations are common in chemical products and have no effect on transportation safety

B. No, because the shipping papers confirm the product identity and the driver has no authority to question product quality

C. Yes, but only if the color change is accompanied by a change in odor — color alone is never a reliable indicator of a problem

D. Yes, an unusual color change could indicate contamination from a previous load, degradation of the product, or loading of the wrong material — the driver should report the observation to the carrier and the loading facility before departing

41. A loaded tank vehicle approaches a highway onramp. The ramp merges into the right lane of a fourlane highway. Traffic on the highway is heavy, traveling at 65 mph. The driver must accelerate on the ramp to merge speed. What surge effect occurs during this acceleration?

A. The liquid surges sideways during the curving onramp, then shifts rearward during acceleration, creating a combined lateral and backward surge pattern

B. The acceleration eliminates all surge by pressing the liquid firmly against the rear head, stabilizing the vehicle for the merge

C. The liquid surges forward during the acceleration, reducing rearaxle traction and potentially causing the drive wheels to spin

D. The liquid remains stationary during acceleration because the sealed tank prevents any movement once the liquid is settled

42. A tank vehicle driver is making a delivery when the product hose develops a pinhole leak. A fine spray of product is visible from a point approximately 10 feet from the cargo tank's discharge valve. The spray is small but continuous. What should the driver do?

A. Stop the pump immediately, close all discharge valves, and replace the hose section before resuming the delivery — even a small continuous spray of a hazardous or flammable product creates a safety hazard and product loss

B. Continue the delivery at reduced flow rate because lower pressure will reduce the spray volume to an acceptable level

C. Wrap the pinhole with duct tape while the pump continues running, since the tape will seal under the product's pressure

D. Move the leaking section of hose to a position where the spray is directed downward into the customer's containment area

43. A tank vehicle equipped with a multicompartiment tank has been fully loaded at a terminal. The driver weighs the vehicle at the terminal's scale. All axle groups are within legal limits.

During the trip, the driver makes three deliveries, progressively emptying compartments from front to rear. After the third delivery, only the rearmost compartment (compartment 5) remains loaded. What axle weight concern might exist at this point?

- A. No concern — multicompartment tanks are designed so that any single compartment, when loaded alone, produces legal axle weights
- B. Compartment 5 is always the smallest compartment on multicompartment tanks, so its weight cannot exceed any axle limit
- C. The weight concern is on the steer axle, which may be overloaded with the full rearmost compartment pulling down on the rear of the trailer
- D. The rearmost compartment loaded alone concentrates all cargo weight over or behind the trailer's tandem axle group, potentially exceeding the rear tandem limit while underloading the drive axles and steer axle

44. A loaded tank vehicle's air brake system warning buzzer activates, indicating air pressure has dropped below approximately 60 psi. The driver is on a highway in the right lane. What is the most critical immediate action?

- A. Continue driving at reduced speed to the next exit while monitoring the air pressure gauge for further decline
- B. Begin moving to the shoulder immediately using whatever braking remains — with each brake application, more air is consumed and each subsequent application becomes weaker, leaving progressively less stopping ability
- C. Shift to neutral and coast, using the parking brake as the primary braking system for the remainder of the trip
- D. Apply the brakes firmly once to stop the vehicle immediately before any more air pressure is consumed

45. A driver is performing a pretrip inspection on a cargo tank and discovers that one of the tank's pressure relief valves is missing its rain cap (the protective cover that prevents debris from entering the valve mechanism). The relief valve itself appears to be in proper condition. Should the driver be concerned?

- A. No, rain caps are cosmetic accessories with no functional purpose in the operation of the pressure relief valve

B. No, because the relief valve's internal mechanism is sealed and selfcleaning, making the rain cap unnecessary

C. Yes, but only during winter months when freezing precipitation could obstruct the valve mechanism — during dry weather, rain caps are optional

D. Yes, without the rain cap, debris, insects, or water can enter the valve mechanism and potentially interfere with its proper operation — the driver should report the missing cap and have it replaced

46. A tank vehicle driver completes the last delivery of the day. The tank is empty — drained but not cleaned. Before departing on the empty return trip, the driver must make which of the following checks regarding placards?

A. Verify whether the FLAMMABLE placards should remain — if the tank contained flammable liquid and has not been cleaned and purged of residue and vapors, the placards must stay until the tank is properly cleaned

B. Remove all placards immediately because the tank is empty and no product remains

C. Replace the classspecific placards with DANGEROUS placards for the empty return trip

D. Add an additional placard reading "EMPTY — PREVIOUSLY CONTAINED FLAMMABLE LIQUID" below each existing placard

47. A loaded tank vehicle approaches a controlled intersection where the light has just turned green. Several vehicles ahead are beginning to accelerate from a complete stop. The tank vehicle driver begins accelerating to follow traffic. What should the driver be aware of regarding the vehicle's acceleration behavior?

A. The vehicle will accelerate faster than a dry van of equal weight because the liquid cargo provides momentum assistance

B. The vehicle will accelerate at the same rate as any comparably weighted vehicle because acceleration forces do not interact with liquid cargo

C. During acceleration, the liquid surges rearward, temporarily shifting weight off the front steering axle and onto the rear drive axles — while this improves driveaxle traction, it reduces frontend steering responsiveness and road feel

D. During acceleration, the liquid surges forward, overloading the front axle and causing the steering to become heavy

48. A tank vehicle driver notices during an enroute stop that a small amount of product is weeping from around the bolts on a manhole cover. The seepage is very slow — just a slight dampness around two of the twelve bolts. What should the driver do?

A. Continue driving because slight bolt seepage is normal for cargo tanks and is accounted for in the tank's design tolerances

B. Check whether the two weeping bolts can be tightened slightly to compress the gasket more firmly — if tightening stops the seep, the driver should monitor the area at the next stop, and if the seep continues or worsens, report it for maintenance

C. Remove the manhole cover completely to inspect the gasket, then reinstall the cover with new bolts

D. Loosen all twelve bolts evenly, then retorque them in a star pattern to redistribute pressure across the entire gasket

49. A loaded tank vehicle has been traveling for several hours through varying terrain — flat highway, hills, curves, and construction zones. The driver is now on a long, straight, flat section of highway. What cumulative effect might the varied driving conditions have had on the cargo securement system?

A. Varied driving conditions have no cumulative effect on cargo tank systems because the tank itself is the containment vessel

B. The repeated forces from braking, acceleration, curves, and bumps throughout the day can gradually loosen fittings, stress gaskets, fatigue pipe brackets, and work bolts loose through vibration — the driver should perform periodic enroute checks of external fittings and connections

C. The varied terrain has improved the overall tightness of all fittings because the vibration acts like a natural torque wrench

D. Only extreme terrain variations affect tank fittings — normal highway driving through varied terrain produces forces well within design tolerances

50. A tank vehicle driver has been operating the same vehicle for six months and has developed a strong familiarity with the vehicle's handling characteristics when fully loaded with gasoline (specific gravity approximately 0.73). Today, the driver is assigned to haul a load of liquid fertilizer with a specific gravity of 1.3. The tank is loaded to the same volume. What critical handling differences should the driver anticipate?

- A. The lighter fertilizer will produce less surge than gasoline, requiring no adjustment to driving behavior
- B. The fertilizer's higher viscosity eliminates all surge effects, making the vehicle easier to handle than when loaded with gasoline
- C. The two products handle identically because specific gravity has no effect on vehicle dynamics when loaded to the same volume
- D. The fertilizer is approximately 78 percent heavier than gasoline at the same volume, producing significantly greater surge forces, higher center of gravity, and potentially different axle loading — the driver must verify weights on a scale and adopt more conservative driving behavior

Practice Exam 18: Answer Key and Explanations

- 1. C** — Placing an "X" in Column 1 of the shipping paper table is one of the three accepted methods for distinguishing hazardous material entries from non-hazardous entries on the same document. The other two methods are listing HazMat entries first (before non-hazardous entries) or highlighting them in a contrasting color. Using multiple methods simultaneously is permitted.
- 2. A** — Placards must be visible from all four approach directions at all times — including when the vehicle is parked. An adjacent truck blocking the driver's-side placards prevents emergency responders approaching from that direction from identifying the hazardous cargo. The driver should reposition one of the vehicles to restore placard visibility from all four sides.
- 3. D** — A package marked with a withdrawn DOT specification may have been manufactured or tested under standards that are no longer considered adequate for safe transport. The current shipping papers cannot compensate for packaging that may not meet current structural or performance requirements. The driver should refuse the package until the shipper resolves the discrepancy.
- 4. B** — Division 5.1 Oxidizer at 1,800 pounds exceeds the 1,001-pound Table 2 threshold, requiring OXIDIZER placards. Division 4.1 Flammable Solid at 600 pounds does not independently reach the threshold. The OXIDIZER placard is mandatory, and while not required, the driver may voluntarily display FLAMMABLE SOLID placards as well for enhanced hazard communication.
- 5. C** — Even a faint chemical odor from packaged Class 3 Flammable Liquid warrants investigation. The odor indicates that vapors are present in the cargo space, which could mean a package has a slow leak, a damaged seal, or a stressed container. The driver should carefully check packages for dampness, damaged closures, or other signs of containment compromise.

6. A — Division 2.3 Poison Gas is Table 1, requiring POISON GAS placards at any quantity — the 200 pounds triggers this automatically. Division 2.2 Non-Flammable Gas at 900 pounds does not independently reach the 1,001-pound Table 2 threshold, so no NON-FLAMMABLE GAS placard is required. Only the POISON GAS placard is mandated.

7. D — The driver should activate hazard flashers to warn approaching traffic, set out reflective triangles behind the vehicle, remain with the vehicle, and call for assistance. A placarded vehicle stopped on a dark rural road is vulnerable to rear-end collisions if not properly marked. The driver should not abandon the vehicle or take an unevaluated alternate route.

8. B — Division 6.2 Infectious Substances require specialized knowledge that differs significantly from standard HazMat handling. Before accepting, the driver should confirm proper segregation can be maintained and should understand the specific requirements for Division 6.2 — including packaging integrity monitoring, spill response procedures specific to biological agents, and personal protection protocols.

9. D — Packing Group I indicates the most dangerous version of the material within its hazard class. For the driver, this means the material has the most aggressive regulatory controls — stricter packaging, more specific handling requirements, and greater consequences if released. The driver should exercise heightened awareness throughout transport.

10. A — A deteriorating brake system on a placarded HazMat vehicle is an emergency requiring immediate action. A soft brake pedal that gets softer with each application indicates progressive fluid loss that will eventually result in total brake failure. The driver must pull over at the nearest safe location before the brakes fail completely.

11. B — A label showing Division 6.1 Toxic on a drum that the shipping papers identify as Class 3 only indicates a discrepancy that must be resolved. Either the label is wrong (and should be replaced by the shipper) or the shipping papers are incomplete (and should be updated to include the toxic subsidiary hazard). The driver should not attempt to resolve it independently.

12. D — Property damage exceeding \$50,000 is one of the mandatory triggers for immediate telephone notification to the National Response Center, even when no hazardous material is released. Other NRC triggers include death, hospitalization, public evacuation lasting one hour or more, and major transportation artery closure for one hour or more.

13. A — Since no restrictions are posted, the driver may legally proceed through the tunnel. However, the driver should be aware that a flammable gas release inside a confined tunnel would be far more dangerous than on open road — limited ventilation, restricted evacuation, and difficulty for responders. If a reasonable surface route is available, it may be the more prudent choice.

14. C — When individual Table 2 materials each independently exceed the 1,001-pound threshold, each requires its own class-specific placard. DANGEROUS placards may only substitute for class-specific placards when no single class independently reaches 1,001 pounds. Since both Class 3 and Class 8 independently exceed the threshold, both FLAMMABLE and CORROSIVE must be displayed.

15. A — Wet pavement increases stopping distances, and reduced visibility decreases the driver's available reaction time. For a HazMat vehicle, the combination means the driver has

less time to see a hazard and needs more distance to stop safely. Reducing speed proportionally to conditions is the most important adjustment to maintain the safety margin.

16. D — Packages showing signs of being opened, resealed with different tape, and relabeled with new labels over old ones raise legitimate concerns about the accuracy of the current classification. The original labeling underneath may represent a different hazard class. The driver should request clarification from the shipper about what the packages contain and why they were repackaged.

17. B — Division 1.3 Explosives are Table 1 materials requiring the vehicle to be attended at all times or parked in a safe haven. A locked, unattended safe haven does not provide the required security. The driver must contact the carrier immediately to arrange alternative secure parking — a truck stop, highway shoulder, or other unsecured location is not acceptable for overnight explosives parking.

18. C — Any unidentified liquid beneath a HazMat vehicle must be investigated. The driver should systematically check potential sources — air conditioning condensation, hydraulic fluid leaks, coolant, or cargo leakage — to determine the origin. Treating the liquid as potentially hazardous until its source is confirmed protects the driver and prevents a minor leak from becoming a major release.

19. A — Division 4.3 Dangerous When Wet is Table 1, requiring DANGEROUS WHEN WET placards at any quantity — the 500 pounds triggers this automatically. Division 5.1 Oxidizer at 800 pounds does not independently reach the 1,001-pound Table 2 threshold, so no OXIDIZER placard is required. Only the DANGEROUS WHEN WET placard is mandated.

20. D — The returned copy of the Uniform Hazardous Waste Manifest must be delivered to the carrier, who is required to retain it for at least 3 years. This copy documents the complete chain of custody — confirming the waste was delivered to the designated facility — and must be available for inspection by regulatory authorities throughout the retention period.

21. B — While the regulatory no-smoking zone is 25 feet from the placarded vehicle, flammable vapors during an active unloading operation can travel well beyond 25 feet, especially with wind. A lit cigarette at 40 feet during active flammable liquid transfer represents a genuine ignition risk. The driver should stop the operation and ask the person to extinguish the cigarette immediately.

22. D — Preferred HazMat routes are designated highways that balance transportation efficiency with public safety. They direct HazMat vehicles away from densely populated areas, sensitive environmental zones, and high-risk infrastructure such as water treatment facilities and tunnels. Following preferred routes is a key component of responsible HazMat routing.

23. C — Both the "X" in Column 1 and the contrasting color (red ink) are accepted methods for distinguishing hazardous material entries from non-hazardous entries on the same shipping paper. Using two methods simultaneously is redundant but not a violation. Either method alone would satisfy the regulatory requirement for distinguishing HazMat entries.

24. A — Poison Inhalation Hazard materials are categorized into Hazard Zones A through D based on inhalation toxicity. Zone C indicates moderate inhalation toxicity — less acutely lethal than Zones A or B but still presenting serious respiratory danger. The zone designation

triggers specific placarding requirements and enhanced operational procedures during transport.

25. D — Specific operational details about cargo types, routing patterns, and security procedures should not be shared with unknown persons — including journalists. This information could be used to plan theft, diversion, or sabotage of hazardous materials shipments. Media inquiries should be directed to the carrier's communications department.

26. B — While sealed metal drums are weather-resistant, covering them with a tarp protects labels and markings from water degradation, prevents water from accumulating around closures where it could cause corrosion or freeze in cold weather, and maintains the professional presentation of the load. Covering HazMat cargo on flatbed trailers is good professional practice.

27. A — The FLAMMABLE placards should be removed since all Class 3 material has been delivered. The remaining Division 5.1 (500 lbs) and Class 8 (700 lbs) do not individually reach 1,001 pounds, but their combined total of 1,200 pounds exceeds the threshold. DANGEROUS placards may be used for two Table 2 classes whose combined weight meets the requirement.

28. D — The immediate priority is preventing a collision with the children. With Division 1.1 Explosives, a collision could trigger a mass detonation that would be catastrophic for the entire neighborhood. The driver must stop the vehicle safely and wait for the children to completely clear the area before proceeding slowly through the residential zone.

29. B — The base brakes still function without ABS, but the driver has lost the anti-lock protection that prevents wheel lockup during hard braking. In a HazMat vehicle, wheel lockup during an emergency stop means loss of directional control — the vehicle cannot be steered while the wheels are locked. This is especially critical when maintaining control is paramount.

30. C — While Class 7 Radioactive packages are designed to limit radiation exposure, the proximity of particularly radiation-sensitive populations — especially children — warrants careful consideration. The driver should verify that the delivery time and distance from the waiting room keep exposure well within safe parameters, and coordinate with the facility for optimal delivery positioning.

31. A — Hard braking in a loaded smooth bore tank extends stopping distance due to forward surge, but the vehicle remains in its lane and upright. A hard swerve at highway speed generates lateral surge that can exceed the rollover threshold almost instantaneously. While neither option is ideal, the consequences of a rollover with HazMat cargo are generally more catastrophic than a controlled hard stop.

32. C — A compressed and flattened gasket section has lost the resilience needed to maintain a reliable seal under varying conditions. Road vibration, temperature changes, and pressure fluctuations continuously stress the gasket during transport. A section that cannot spring back to fill gaps may allow vapor or liquid to seep past the seal, worsening over the course of a trip.

33. B — During extended deceleration from 55 to 25 mph, the liquid in each baffled compartment shifts forward incrementally. The baffles slow and reduce this movement but do not eliminate it. The driver should be aware that the vehicle's effective weight distribution has shifted forward throughout the deceleration, affecting braking response and steering feel.

34. D — Surge force is directly proportional to the mass of the liquid in motion. A liquid with specific gravity 2.0 has twice the mass of water at the same volume, producing approximately twice the surge force during every braking, acceleration, and turning event. The driver must account for these significantly amplified forces with more conservative driving behavior.

35. A — Rumble strips create rapid vertical jolts that produce vertical sloshing in the liquid cargo. At high fill levels, the liquid has less room to absorb these vertical impulses, concentrating the force on the tank's upper surfaces — manhole gaskets, vent fittings, and the top of the tank shell. The driver should reduce speed before crossing rumble strips to minimize the vertical impact force.

36. D — "V" indicates the external visual inspection date, "K" indicates the leakage test date, and "P" indicates the pressure test date. These three tests, performed at specified intervals, verify the tank's structural integrity and seal. The dates confirm the tank's testing currency — if any test is overdue, the tank cannot be operated until the required test is completed.

37. C — A sudden reduction in flow rate despite constant pump speed strongly suggests increasing back-pressure from downstream. The most likely cause is the customer's underground tank approaching capacity. Continuing to pump against increasing back-pressure risks overfilling the receiving tank. The driver should stop pumping and verify remaining capacity before continuing.

38. B — A 2-inch shift against the wheel chocks on a grade indicates the parking brake may not be holding adequately. While the chocks have prevented further movement, the slippage suggests the parking brake is not providing its full designed holding force. The driver should verify chock placement, consider adding additional chocks, and report the parking brake condition for inspection.

39. A — Cruise control maintains an unnaturally steady speed that eliminates the small natural speed variations of manual driving. These variations normally break up developing sloshing resonance. Without them, the liquid can enter a sustained oscillation at the vehicle's natural roll frequency that builds progressively. Disengaging cruise control and gradually reducing speed breaks the resonance cycle.

40. D — An unusual color change in a product the driver has hauled many times warrants investigation. The change could indicate contamination from a previous load that wasn't properly cleaned, degradation of the product, or loading of the wrong material entirely. The driver should report the observation before departing so the loading facility can verify the product.

41. A — During acceleration on a curving on-ramp, the liquid experiences two simultaneous forces: lateral surge from the curve pushing it outward, and rearward surge from the acceleration. These combined forces shift weight toward the rear-outside corner of the tank, reducing traction on the front steering axle and the inside drive tires. The driver should accelerate smoothly and gradually.

42. A — Even a small continuous spray from a pinhole represents an ongoing product loss and safety hazard — particularly with flammable or hazardous liquids where the spray creates vapor and creates a slip hazard. The driver should stop the pump, close all discharge valves, and replace the damaged hose section before resuming the delivery.

43. D — With only the rearmost compartment loaded, all cargo weight is concentrated at or behind the trailer's tandem axle group. This can overload the rear tandem while significantly underloading the drive axles and steer axle. The resulting weight imbalance affects braking, steering, and overall vehicle handling — the driver should verify axle weights.

44. B — Below 60 psi, the air brake system is critically low. Each subsequent brake application consumes more stored air, and without the compressor replenishing it, each application is weaker than the last. The driver must begin moving to the shoulder immediately while enough braking force remains. Waiting or continuing to drive risks total brake loss on a loaded tank vehicle.

45. D — The rain cap protects the pressure relief valve's mechanism from debris, insects, ice, and water that could interfere with proper operation. Without it, foreign material can enter the valve and either prevent it from opening (causing overpressure) or prevent it from resealing (causing continuous product loss). The missing cap should be reported and replaced.

46. A — An "empty" tank that contained flammable liquid and has not been cleaned and purged still contains residual liquid film and flammable vapors. These present the same fire and explosion hazards as the original product. The FLAMMABLE placards must remain until the tank is properly cleaned and purged of all residue and vapors.

47. C — During acceleration from a stop, the liquid surges rearward due to inertia. This temporarily shifts weight off the front steering axle (reducing steering response and road feel) and onto the rear drive axles (improving traction for acceleration). The driver should be aware of the lighter front-end feel during acceleration and avoid aggressive steering inputs until speed stabilizes.

48. B — Slight seepage around two bolts may indicate those bolts have loosened from vibration or the gasket has compressed unevenly in that area. Carefully tightening the two weeping bolts may compress the gasket enough to stop the seep. If tightening resolves the issue, the driver should monitor at subsequent stops; if it continues, the gasket likely needs replacement.

49. B — The cumulative effect of hours of varied driving — braking forces, acceleration loads, cornering stress, vertical jolts from bumps and construction zones — can gradually loosen fittings, stress gaskets, fatigue pipe brackets, and work bolts loose through sustained vibration. Periodic en-route checks of external fittings and connections help catch these developing issues before they become leaks.

50. D — Liquid fertilizer at specific gravity 1.3 is approximately 78 percent heavier than gasoline at specific gravity 0.73 when loaded to the same volume. This dramatically increases surge forces during braking and turning, raises the center of gravity, and may push the vehicle over axle weight limits. The driver must verify weights and adopt significantly more conservative driving behavior.