PRACTICE TEST

for

MECHANICAL CONCEPTS

THIS TEST MIMICS THE STYLE OF TEST FOR MECHANICAL CONCEPTS USED BY
THE PLANT OPERATOR SELECTION SYSTEM (POSS).

PRACTICE for MECHANICAL CONCEPTS

The Plant Operator Selection System (POSS) includes a test for Mechanical Concepts. Mechanical concepts seen in everyday life, can be quite simple, and yet found on the principles of physics, material properties and basic electrical properties. This test gages your ability to draw appropriate conclusions regarding mechanical principles.

To help you prepare, a practice test follows with 26 different scenarios. Each scenario gives you a picture to illustrate a particular situation. For each situation, there will be one correct answer out the three possible answers shown. This practice test helps you to practice determining the appropriate outcome for each situation, and within a suggested time limit.

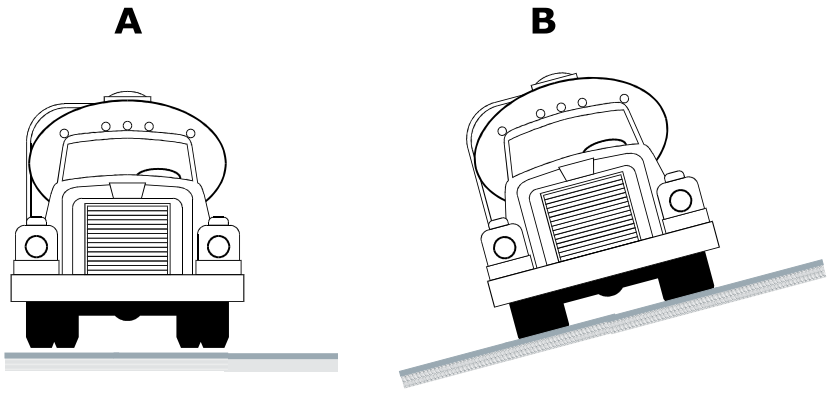
The questions you answer will be multiple-choice, A, B or C. The correct answer depends upon your accurate determination of the outcome posed by the situation. Set a timer for 13 minutes. Carefully consider each situational problem for the outcome that will occur. Select the appropriate answer on the answer sheet by completely filling in the circle your choice of A, B, or C. You should be able to answer all 26 questions within the 13-minute time limit.

Practicing by taking this test will familiarize you with the style of the real selection test. To create conditions most like a real test:

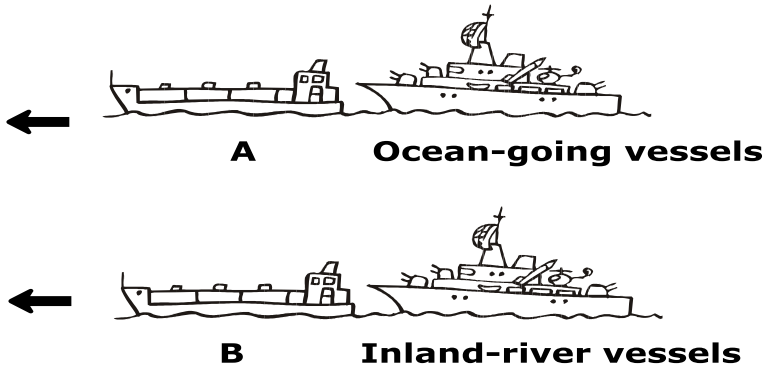
- Practice by completing all 26 test questions
- Be sure to set a timer before beginning each part
- Do not look at the answers that follow at the end until you have completed all the test questions

MECHANICAL CONCEPTS PRACTICE TEST

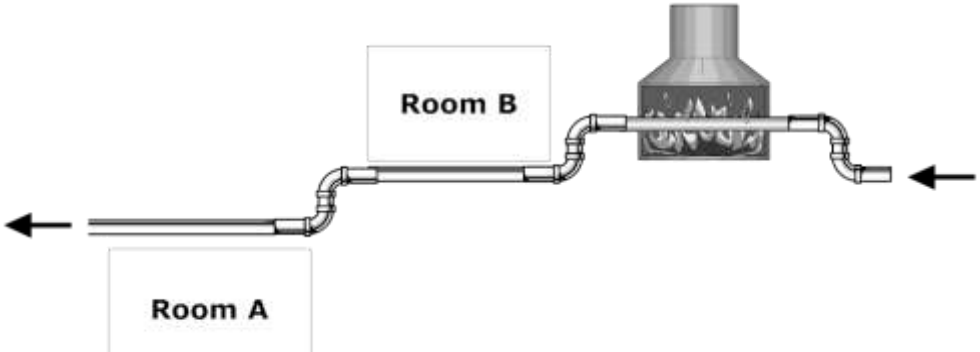
1. Each truck travels at a very high rate of speed without braking, through a curve to their right side. Which truck is less likely to veer off the road while negotiating the curve (A or B)? (If equal, mark C.)



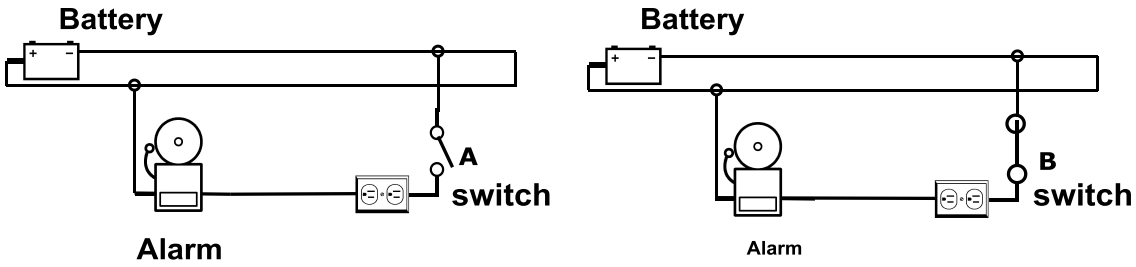
2. In each picture shown, the tugboat tows the military ship. Assume the tugboat and military ships all weigh the same; each tugboat operates at the same power; and in both situations, the distance to port is the same. Disregarding wind, currents and tides (all things being equal), which tug and ship (A or B) is more likely to reach port the faster. (If equal, mark C.)



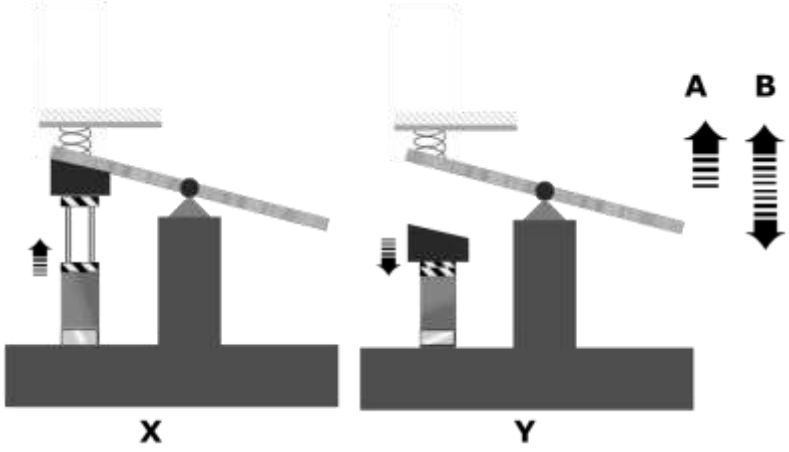
3. Water flows, in the direction of the arrows, through the piping when the boiler flame burns. Which room, (A or B) will likely remain the hottest when the boiler operates and water continuously flows through the piping in the direction of the arrow? (If equal, mark C.)



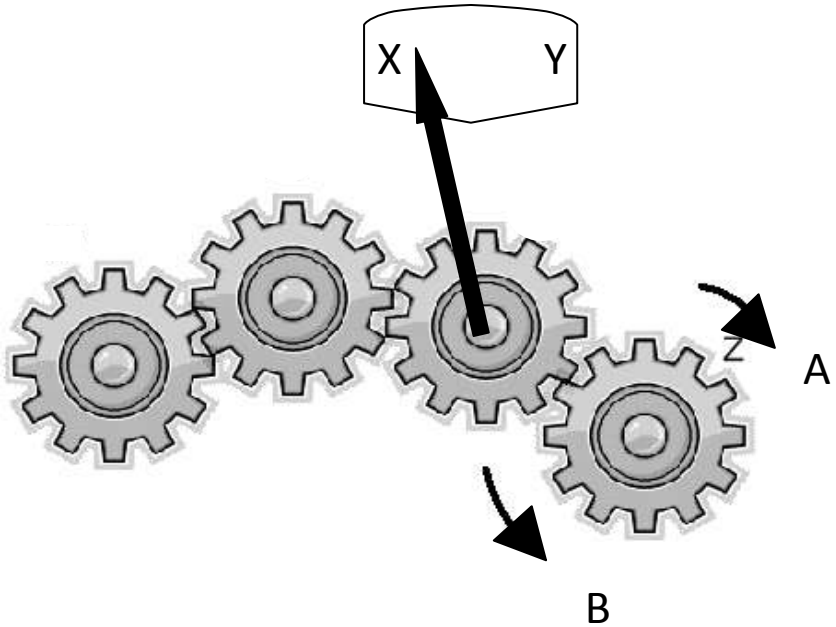
4. Should the switch be in position (A) or position (B) for the alarm to operate? (If the alarm will operate when the switch is in either position, mark C.)



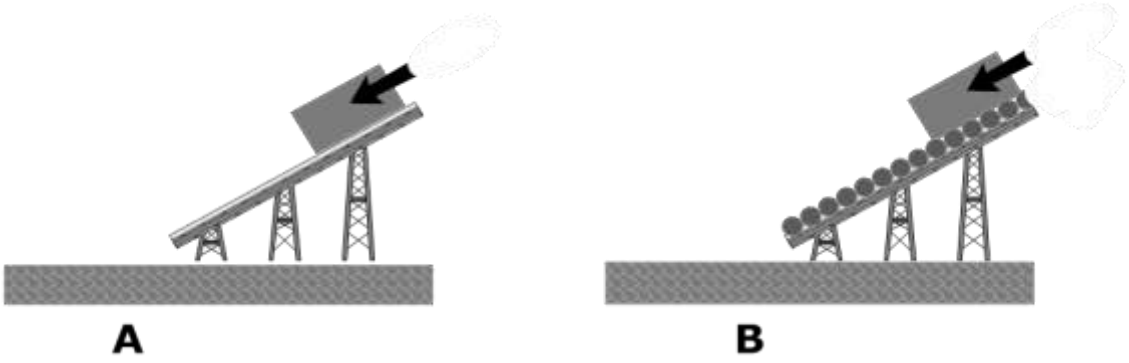
5. In view X, the lift has pushed upward on the lever to compress the spring as shown. If the lift suddenly drops, will the lever more likely move up (A) or up & down as in (B)? (If neither applies, mark C.)



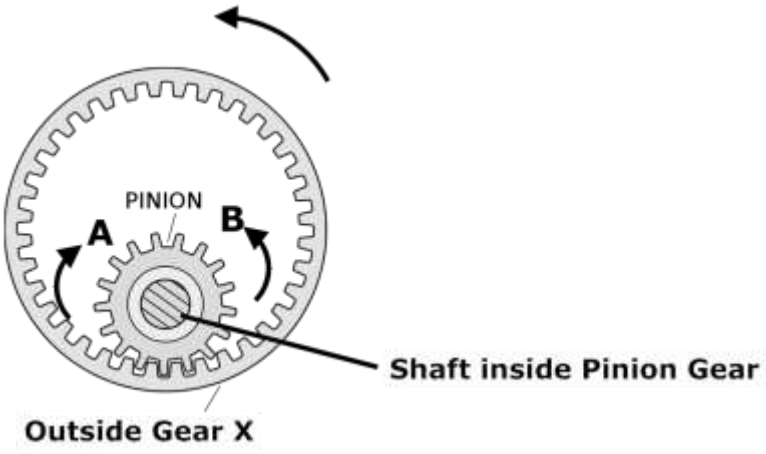
6. The indicator attached to Gear Y points to X. Which way must Gear Z rotate (A or B) in order for the indicator to point to X as shown? (If either rotation moves the indicator to X, mark C.)



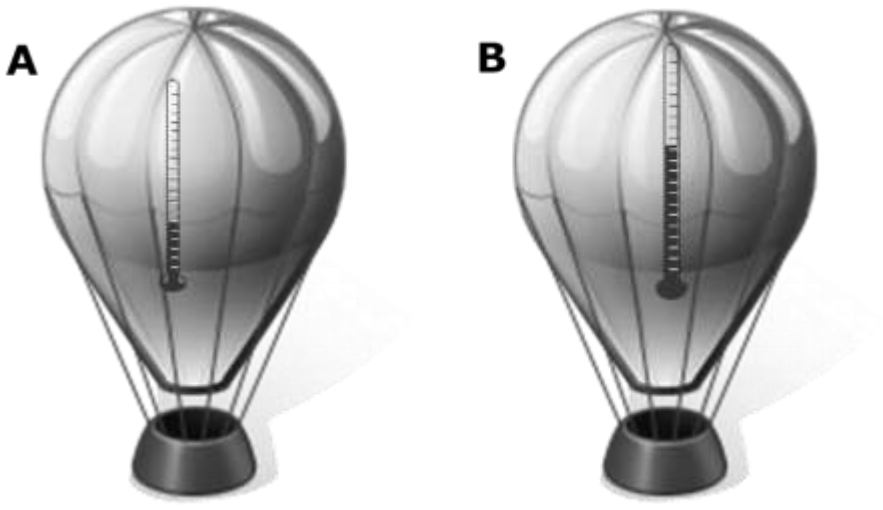
7. An equal push at the same speed propels an identical load down each slide toward the water. Both slides orient at the same angle and height relative to the water. The surface of the slide shown in A is a smooth, and in B, it is a roller surface. Will the splash at A or B be bigger? (If equal, mark C.)



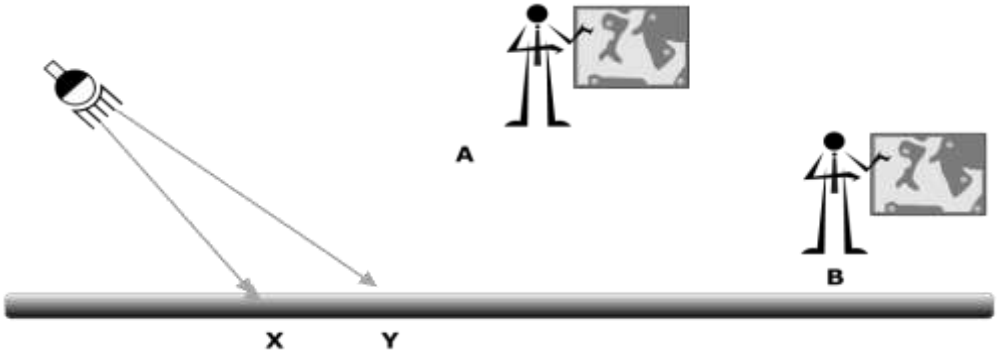
8. The outside gear X counterclockwise (in the direction of the outside arrow.)This enables the internal pinion gear to rotate. Will the shaft inside the pinion gear turn toward (A) or (B)? (If the shaft does not move, mark C.)



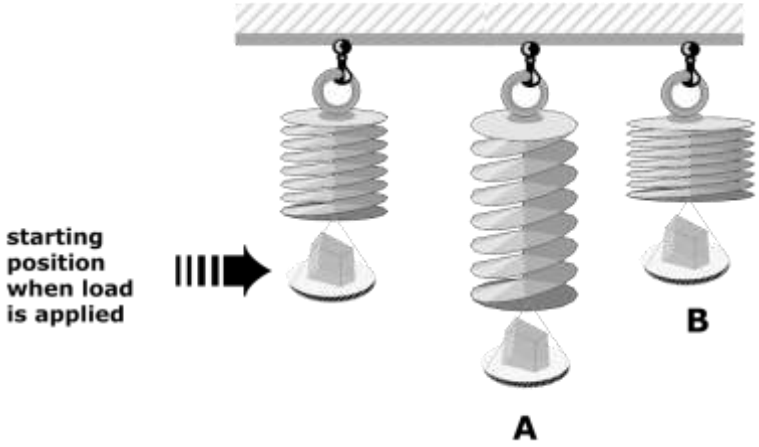
9. For each hot air balloon shown, the temperature inside each balloon displays on the thermometers. Based on the temperatures shown, which hot air balloon, (A or B), has the greatest internal pressure? (If equal, mark C.)



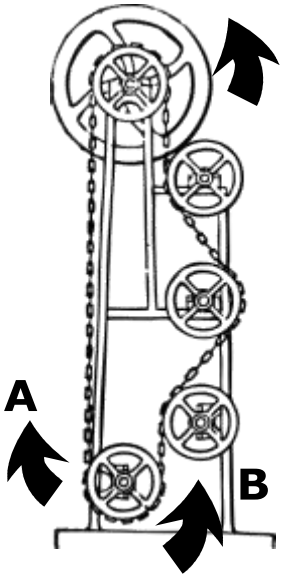
10. Light from the lamp reflects off the mirrored surface between points X and Y. Which person, (A or B) will have a better light on their display map? (If equal, mark C.)



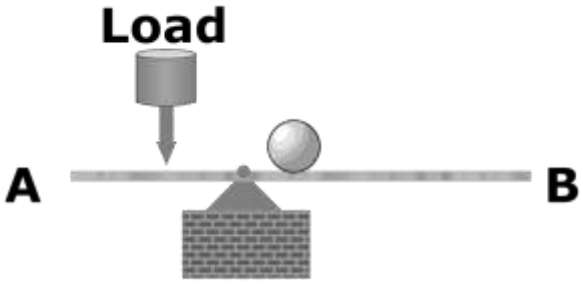
11. The picture shows a suspended coil spring in a starting position on the left. When a load much heavier than the spring, is loaded onto the suspended plate beneath the spring, how will the spring move? Will the spring more likely behave as shown in A or B? (If neither applies, mark C.)



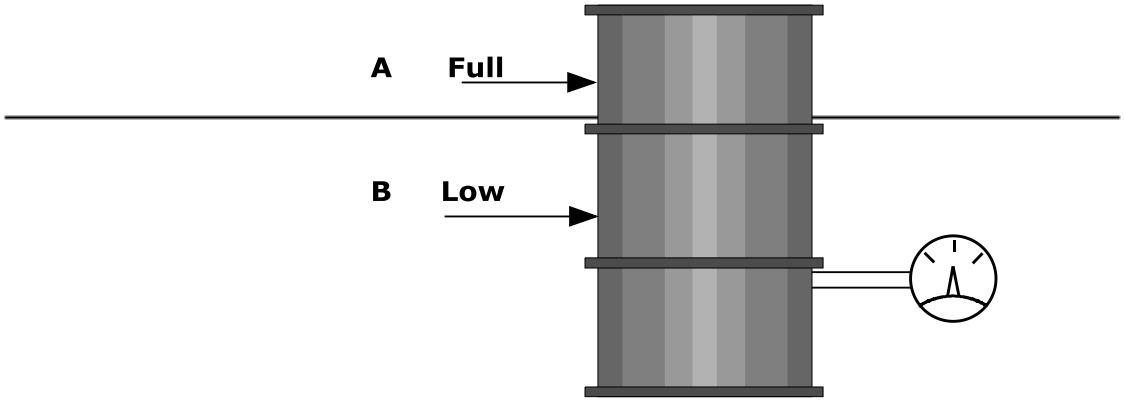
12. When the top gear moves counter-clockwise, will the chain around the bottom gear move in direction A or B? (If no movement, mark C.)



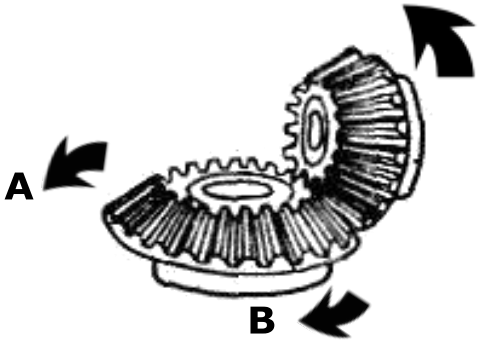
13. When the load applies downward upon the lever, will the ball move toward A or toward B? (If the ball remains unaffected by applying the load, mark C.)



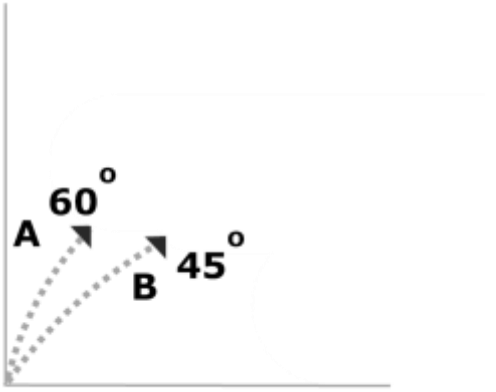
14. The drum of oil is full when filled to level A, and low when filled to level B. At which level will the pressure gage shown on the right side read the highest (A or B)? (If equal, mark C.)



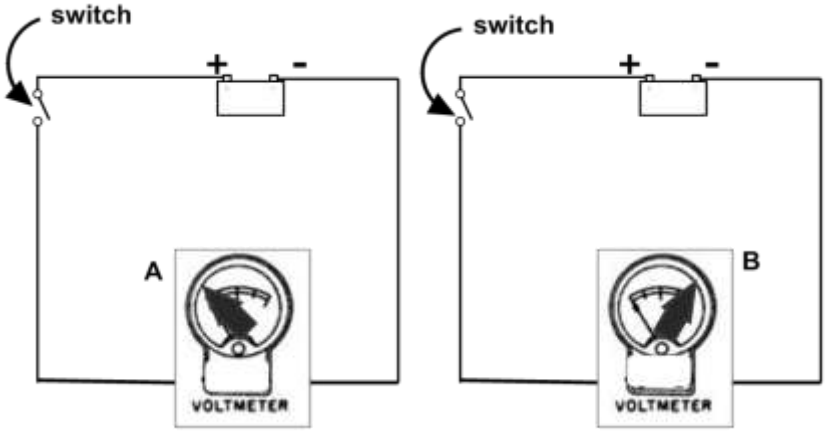
15. The top right sprocket gear moves, when a motor activates, in the direction of the arrow. Will this movement cause the bottom sprocket gear to move counterclockwise toward A, or clockwise toward B? (If the bottom sprocket gear does not move, mark C).



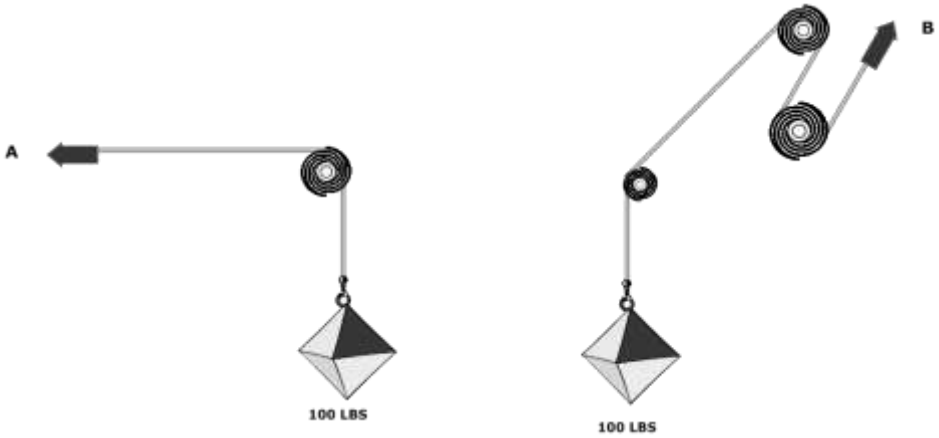
16. Two arrows are shot from the ground with the same force. Arrow A follows the 60° path (A). Arrow B follows the 45° path. Which arrow will obtain the greatest height before falling to the ground (A or B)? (If equal, mark C.)



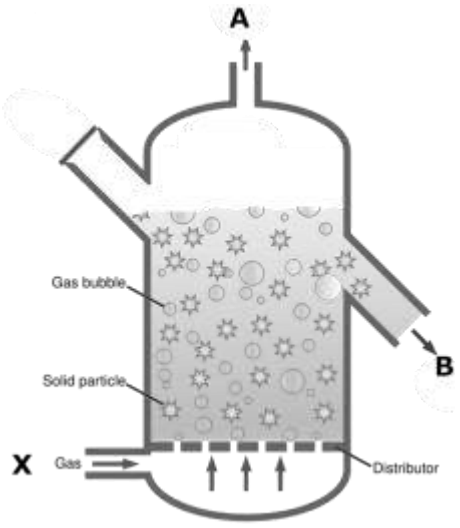
17. Each picture shows the same circuit, powered by a battery, with a voltmeter and an open switch. When the switch in each picture is closed, will the voltmeter more likely register at position A or B? (If neither, mark C.)



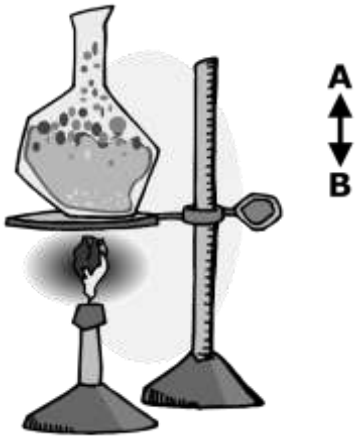
18. Will a motor pulling at point (A) or at point (B) require more horsepower to lift the 100-pound load? (If equal, mark C.)



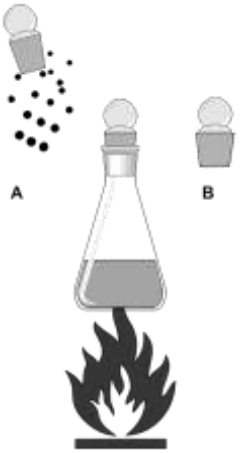
19. Gas enters the chamber from the pipe at X. Is gas more likely to escape from (A or B)? (If equal, mark C.)



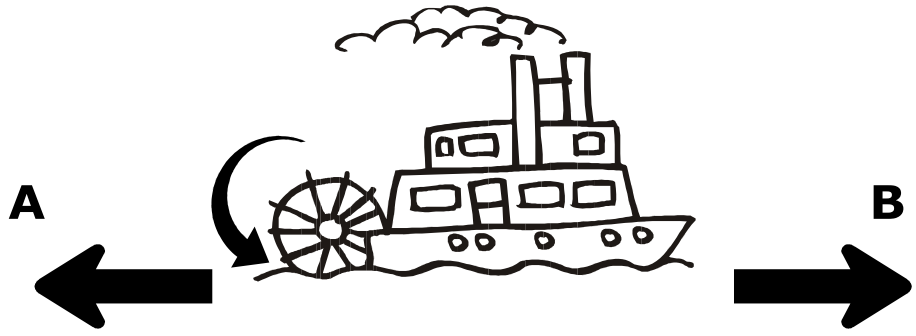
20. A burner heats the liquid in the glass beaker until vapor escapes from the top of the beaker. Will the liquid surface more likely register at (A) or (B) after prolonged heating? (If the surface of the liquid does not change, mark C.)



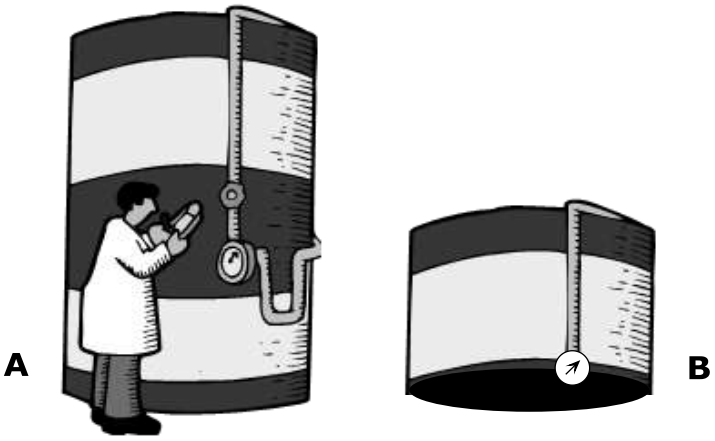
21. When the laboratory flask containing water heats until the water boils and steam forms inside the beaker, will the top of the flask grow tighter by expanding, like shown in (B), or will it more likely pop off, like shown in (A)? (If A or B could happen, or if nothing will happen, mark C.)



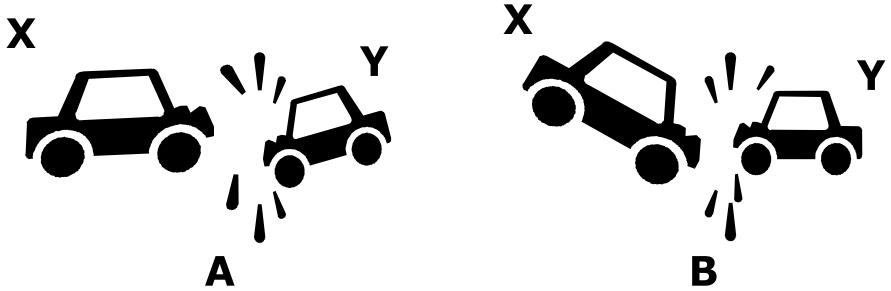
22. The steamboat's paddlewheel is turning in the direction shown. Will the steamboat move in direction A or B? (If neither, mark C.)



23. Tanks A and B contain the same type and volume of a gas. Will the laboratory technician find the pressure reading higher on Tank A or Tank B? (If equal, mark C.)



24. Car X is twice the weight of Car Y. If both cars, traveling at equal speeds hit head-on, which picture, (A or B) better represents the resulting collision? (If either could apply, mark C.)



25. An equal load is applied to each end of the lever in the direction of the arrows shown. Will the lever move up at (A), or at (B) when the loads are applied? (If the lever will not move, mark C.)

26. The lever shown is being pulled upward on the left side. Will this action create movement in the ball toward (A) or (B)? (If no movement is created, mark C.)

Answers with explanations begin on the next page.