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| **Auto Upkeep (2nd Edition)** |  | Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Test for Chapters 11-20 |  | Date \_\_\_\_/\_\_\_\_/\_\_\_\_ |
|  |  | Test Score \_\_\_\_ |

# Section 1: Selected Response

Directions: Place the letter that corresponds to the correct answer on the space provided.

 a 1. Fuel pumps are either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. mechanical or electric
2. chemical or electric
3. nuclear or electric
4. thermal or electric

 a 2. What is the name of the technology that uses engine control systems to shut off the air-fuel mixture to some of the engine’s cylinders when all the cylinders are not needed?

1. cylinder deactivation
2. powertrain control module
3. blow-by
4. distillation

 d 3. Approximately what temperature will the antifreeze freeze if mixed 50% water and 50% antifreeze?

1. 212ºF (100ºC)
2. 122ºF (50ºC)
3. 32ºF (0ºC)
4. -34ºF (-37ºC)

 a 4. What is the purpose of the radiator?

1. remove heat from the coolant
2. add heat to the coolant
3. slow down the air through the engine compartment
4. keep the coolant at 195ºF (91ºF)

 a 5. What type of grease is used in spark plug boot ends to inhibit corrosion?

1. dielectric
2. chassis
3. anti-seize
4. white lithium

 c 6. Most automobiles have a \_\_\_\_\_\_ volt DC battery.

1. 2
2. 6
3. 12
4. 120

 c 7. What component in the suspension system combines the shock, spring, and upper control arm into one unit?

1. tire
2. leaf spring
3. strut
4. coil spring

 d 8. What does the P stand for in P205/55R16 89H?

1. pressure
2. psi
3. pounds
4. passenger

 a 9. What converts fluid pressure to mechanical motion?

1. caliper
2. brake shoe
3. rotor
4. bleeder

 d 10. Which drivetrain type uses electronics and speed sensors to control power transfer to all four wheels?

1. front-wheel drive
2. rear-wheel drive
3. four-wheel drive
4. all-wheel drive

 a 11. The most common automatic transmission fluid is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Dexron/Mercon ®
2. 10W30
3. 80W90
4. Type F

 b 12. The \_\_\_\_\_\_\_\_\_\_\_\_ system reduces nitrogen oxide emissions by diluting the air-fuel mixture with the exhaust gases.

1. PCV
2. exhaust gas recirculation
3. oxygen sensor
4. charcoal canister

 a 13. The \_\_\_\_\_\_\_\_\_\_ is basically a silencer to reduce noise pollution.

1. muffler
2. tailpipe
3. exhaust manifold
4. exhaust hanger

 c 14. Which of the following uses a receiver that communicates with orbiting satellites to calculate the location of the vehicle and to guide the driver to a destination?

1. PCV
2. EVAP
3. GPS
4. CCV

 d 15. What type of trailer wiring plug is commonly necessary to tow large heavyweight trailers with trailer brakes?

1. 2 pole
2. 4 pole
3. 5 pole
4. 7 pole

 b 16. What does it mean if the check engine light is blinking?

1. get the oil changed
2. it is a sign of a serious problem
3. flush the cooling system
4. rotate the tires

 c 17. What do the letters OBD represent?

1. on-board defects
2. off-by door
3. on-board diagnostics
4. on-board deals

 a 18. Technician A says that the higher the octane number of gasoline, the more it resists detonation. Technician B says that 93 octane is required for most cars. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

 b 19. Technician A says that most vehicles require 100% pure antifreeze in the coolant system. Technician B says that a 50% antifreeze/50% water mixture is used for most cars. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

#  b 20. Technician A says that all automobiles only have one ignition coil. Technician B says that some automobiles have one coil per cylinder. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

 a 21. Technician A says that when inflating tires, you should check the tire placard for the correct recommended pressure. Technician B says that you can tell when a tire is fully inflated by looking at it. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

 d 22. Technician A says on vehicles that have disc and drum brakes, the drum brakes are always on the front of the vehicle. Technician B says that it is common to have drum brakes on all four wheels on new vehicles. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

 a 23. Technician A says that on front-wheel drive vehicles, a CV shaft connects the transaxle to the wheels. Technician B says that all rear-wheel drive vehicles use CV shafts to connect the transmission to the rear differential. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

 a 24. Technician A says that a rich fuel mixture can cause the catalytic converter to prematurely fail. Technician B says that if a catalytic converter fails, removing it from the system is the recommended fix. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

 a 25. Technician A says that some vehicles have 120V AC power outlets installed from the factory. Technician B says that the battery produces 120V AC power, so converters are not necessary. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

 c 26. Technician A says that when cleaning a battery you should wear gloves, a dust mask, and safety goggles. Technician B says to clean battery terminals you can use a baking soda solution. Who is correct?

1. Technician A
2. Technician B
3. Both Technician A and Technician B
4. Neither Technician A nor Technician B

# Section 3: Constructed Response

Directions: Use complete sentences to answer the following questions. The criteria below will be used to assess your answers. Maximum of 4 marks per question.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Outstanding****(A = 4)** | **Very Good****(B = 3)** | **Acceptable****(C = 2)** | **Attempted****(D = 1)** | **Did Not Attempt (F = 0)** |
| Student demonstrates a complete understanding of the problem. Several details and examples were given to support the answer. The response was extremely well organized. | Student demonstrates a considerable understanding of the problem. Some details and examples were given to support the answer. The response was presented in a thoughtful manner. | Student demonstrates a partial understanding of the problem. Few details and examples were given to support the answer. The response was somewhat organized, but did not have smooth transitions. | Student demonstrates little understanding of the problem. Details and examples were not relevant or not given. The response was difficult to follow and confusing to the reader. However, the student made an honest attempt at answering the question. | No attempt was made to answer the question.  |

27. What is the purpose of the fuel system?

The purpose of the fuel system is to store, transfer, and then to mix the fuel with air. Fuel is added to the fuel tank from a gas station. The fuel (chemical energy) is stored in the gas tank. In a gasoline engine, the fuel is then pumped to the carburetor or injection system. The carburetor or the injection system mixes the fuel with air. The cleanest burning and most fuel efficient mixture is the mass ratio of 14.7 parts of air to 1 part of fuel (i.e., stoichiometric ratio). The mixture is brought into the combustion chamber and burned.

28. The cooling system is designed to do four main tasks. What are these four tasks? Also, list the three properties of coolant.

The cooling system (1) helps the engine reach operating temperature quickly, (2) maintains operating temperature, (3) removes excess engine heat, and (4) provides passenger comfort. Coolant properties include (1) preventing from freezing and boiling, (2) lubricating the water pump, and (3) inhibits corrosion.

29. What is the purpose of the ignition system? Explain how the chemical energy of the battery ultimately becomes mechanical energy of motion to move the vehicle.

The purpose of the ignition system is to step up voltage and to ignite the air-fuel mixture. Chemical energy of the battery is converted to low voltage (12 V DC) electricity. The low voltage is transferred to the coil or coils. The coil or coils step up voltage to around 50,000 volts. The high voltage is sent to the spark plugs. A spark is created from electricity jumping from the center electrode to the side electrode on the spark plug. This spark ignites the air-fuel mixture. This action forces the piston down, causing rotary motion of the crankshaft. The rotary motion of the crankshaft turns the drivetrain components.

30. What is the purpose of the steering system? What is the purpose of the suspension system?

The steering system controls the directional movements of the vehicle. The steering system, in conjunction with the suspension system, provides control and stability of the vehicle. The motion the operator makes at the steering wheel is transferred to the front wheels.

The suspension system helps to control the up and down movement of the vehicle. During braking or going over bumps the suspension system helps provide stability, safety, and control of the vehicle.

31. What is the purpose of the braking system? Explain how applying the brake pedal slows the vehicle.

The braking system is designed to decrease the speed of a vehicle. In order to slow a vehicle there needs to be friction between parts. Unlike the lubrication system, where minimizing friction is the goal, the braking system is designed to use friction for control. When the operator of a vehicle applies force on the brake pedal, kinetic energy of the operator’s foot is converted to hydraulic pressure in the brake master cylinder. Fluid is pushed to the calipers and wheel cylinders. At the calipers and wheel cylinders, fluid is converted to mechanical energy of motion. In a drum brake system, the brake shoes are pushed out causing friction on the brake drum – slowing the vehicle. In a disc brake system, the brake pads squeeze the brake rotor causing friction to slow the vehicle.

32. What is the purpose of the drivetrain?

The purpose of the drivetrain is to transfer power from the engine to the wheels in order to propel the vehicle. This transfer needs to be done smoothly and efficiently. Without smooth transitions, the automobile would not be very comfortable or easy to drive. The drivetrain also helps to control the speed and power through gears.

33. What is the purpose of the exhaust and emission system?

The exhaust and emission system is designed to deal with the inefficient byproducts of the internal combustion process. The exhaust components are designed to dampen the sound of the engine. The emission components are designed to lower the pollution of the vehicle. Vehicle pollution is generally categorized into tailpipe, crankcase, and evaporative emissions.

34. What is the purpose of undercoating?

Undercoating can be added to the underside of the vehicle to deaden road noise and lessen the chance of rust forming. Rust (iron oxide) is formed when oxygen and water come in contact with iron. Since iron is used to make steel, rust can form on unprotected steel automotive components. To rustproof a vehicle more thoroughly, rust-inhibitors can also be sprayed inside body panels. Automotive manufacturers go to great lengths to rustproof vehicles during manufacturing. Most automobiles have corrosion perforation warranties for a designated period of time. Since perforation means hole formation, before the warranty applies, the steel would have to completely rust through.

40. What could cause a no-start situation? List two conditions that commonly occur.

|  |  |
| --- | --- |
| **Condition**  | **Problem**  |
| Will Not Crank  | If the engine will not crank over, you may have a dead battery. Turn on the headlights to see if you have electrical power. If you don’t have any electricity, the headlights or interior light may have been left on and drained the battery over time. If that is the case all you need to do is follow jump-start procedures, restart the car, and drive the car for 15 to 20 minutes to recharge the battery. Also check the battery cables to make sure they are tight.  |
| Cranks, But No Start  | If your engine cranks over but will not start, then the engine may not be getting fuel or spark. This type of situation usually warrants a call to a repair shop.  |
| Key Will Not Turn  | The key will not turn in the ignition if there is pressure on the steering wheel, the gear shifter is not in park, or you are not applying the brake.  |

PART A /26

PART B /36

TOTAL /62