2 MARK QUESTION BANK

UNIT – 1

1. **What is the primary function of an automotive battery?**

   The primary function of an automotive battery is to provide electrical power to start the engine and supply power to the vehicle's electrical systems when the engine is not running.

2. **What type of battery is commonly used in most modern vehicles?**

   Most modern vehicles use a lead-acid battery.

3. **What is the standard voltage of a typical car battery?**

   The standard voltage of a typical car battery is 12 volts.

4. **What are the main types of exterior lights found on a vehicle?**

   The main types of exterior lights on a vehicle include headlights, tail lights, brake lights, turn signals, and fog lights.

5. **What is the purpose of daytime running lights (DRLs)?**

   The purpose of daytime running lights is to increase the visibility of the vehicle during daylight hours, enhancing safety.

6. **What are xenon headlights, and how do they differ from halogen headlights?**

   Xenon headlights, also known as HID (High-Intensity Discharge) headlights, produce brighter and whiter light compared to halogen headlights, using xenon gas and an electric arc instead of a filament.

7. **What is the primary purpose of a vehicle's horn?**

   The primary purpose of a vehicle's horn is to alert other drivers and pedestrians to the vehicle's presence or to signal danger.

8. **How is the sound produced in a typical electric horn?**

   The sound in a typical electric horn is produced by an electromagnet and a diaphragm that vibrates rapidly to create a loud noise.

9. **What mechanism typically drives the windshield wipers in a vehicle?**

   Windshield wipers are typically driven by an electric motor that moves the wipers back and forth across the windshield.

10. **What is the purpose of the intermittent wiper setting?**

The intermittent wiper setting allows the wipers to operate at set intervals, which is useful in light rain or mist conditions, conserving wiper blade life and providing better visibility.

11. **What is another common term for trafficators in modern vehicles?**

Another common term for trafficators in modern vehicles is turn signals or indicators.

12. **How do modern turn signals function to indicate a driver's intention to turn?**

Modern turn signals function by flashing lights on the side of the vehicle corresponding to the direction of the intended turn, activated by the driver using a lever near the steering wheel.

13. **What component in a vehicle ensures that the battery is charged while the engine is running?**

The alternator ensures that the battery is charged while the engine is running.

14. **What is the function of a fuse in an automotive electrical system?**

The function of a fuse in an automotive electrical system is to protect the electrical circuits by breaking the circuit if there is an overcurrent, preventing damage to the system.

15. **How can you test if a car battery is in good condition?**

You can test if a car battery is in good condition by using a multimeter to measure its voltage (should be around 12.6 volts when fully charged) or a load tester to check its performance under load conditions.

UNIT - 2

1. **What is the primary function of the starter motor in an internal combustion engine?**

The primary function of the starter motor is to crank the engine to initiate the engine's operation.

2. **What component connects the starter motor to the engine's flywheel?**

The starter solenoid connects the starter motor to the engine's flywheel.

3. **What is the purpose of a starter relay in a starting system?**

The starter relay controls the high current to the starter motor and ensures that the motor receives sufficient current to crank the engine.

4. **How does the starter motor disengage from the flywheel after the engine starts?**

   The starter motor disengages from the flywheel via a one-way clutch mechanism or a solenoid that retracts the pinion gear once the engine starts.

5. **What is the role of the ignition switch in the starting system?**

   The ignition switch allows the driver to start and stop the engine by controlling the electrical circuit to the starter motor and ignition system.

6. **What is the primary purpose of the ignition coil in an ignition system?**

   The ignition coil converts the low-voltage current from the battery into the high-voltage current needed to create a spark at the spark plug.

7. **How does a distributor function in a traditional ignition system?**

   The distributor directs the high-voltage current from the ignition coil to the appropriate spark plug at the correct time.

8. **What is the function of a spark plug in an ignition system?**

   The spark plug ignites the air-fuel mixture in the engine's combustion chamber by creating a spark.

9. **What is the role of the ignition timing in an ignition system?**

   Ignition timing determines when the spark plug fires relative to the position of the piston to ensure efficient combustion.

10. **How does an electronic ignition system differ from a traditional ignition system?**

    An electronic ignition system uses electronic components such as sensors and control units to manage the ignition process, providing more precise and reliable timing compared to a traditional mechanical system.

11. **What is the purpose of a ballast resistor in an ignition system?**

    The ballast resistor limits the current to the ignition coil to prevent overheating and ensure proper operation.

12. **Explain the function of a crankshaft position sensor in a modern ignition system**

    The crankshaft position sensor monitors the position and rotational speed of the crankshaft, providing data to the engine control unit (ECU) to adjust ignition timing accurately.

13. **What is an ignition control module (ICM)?**

    An ignition control module (ICM) is an electronic device that controls the firing of the ignition coil(s) based on signals from the engine control unit (ECU).

14. **Why is it important to maintain the correct gap in a spark plug?**

    Maintaining the correct gap in a spark plug ensures optimal spark strength and efficient combustion, which improves engine performance and fuel efficiency.

15. **What is the purpose of a dual ignition system in some engines?**

    A dual ignition system uses two separate ignition systems to improve combustion efficiency, reliability, and redundancy, which is particularly important in aviation and some high-performance applications.

UNIT – 3

1. **What is the primary function of an alternator in a vehicle's charging system?**

   To convert mechanical energy into electrical energy to charge the battery and power the electrical systems while the engine is running.

2. **What component in the charging system regulates the output voltage of the alternator?**

   The voltage regulator.

3. **Why is a rectifier used in an alternator?**

   To convert the alternating current (AC) produced by the alternator into direct current (DC) for use by the vehicle’s electrical system and to charge the battery.

4. **What are the main components of an alternator?**

   Stator, rotor, rectifier, voltage regulator, and brushes.

5. **How is the alternator driven in a vehicle?**

   It is typically driven by a belt connected to the engine's crankshaft.

6. **What type of current does an alternator generate before rectification?**

   Alternating current (AC).

7. **What is the typical voltage output range of an alternator in a standard passenger vehicle?**

   Approximately 13.5 to 14.5 volts.

8. **Why is it important to maintain a proper tension on the alternator belt?**

   To ensure efficient power transfer and prevent slipping or breakage.

9. **What can cause an alternator to overcharge the battery?**

   A faulty voltage regulator.

10. **Name a common symptom of a failing alternator.**

    Dimming headlights or electrical accessories not working properly.

11. **What device stores electrical energy for starting the engine and powering the electrical systems when the engine is off?**

    The battery.

12. **What tool can be used to test the output voltage of an alternator?**

    A multimeter or voltmeter.

13. **What is the purpose of the battery warning light on the dashboard?**

    To indicate a problem with the charging system, such as a failing alternator or a loose belt.

14. **What is a common cause of alternator belt noise?**

    Belt misalignment or wear.

15. **How does a vehicle's onboard computer (ECU) interact with the charging system?**

    It can monitor the charging system and control the voltage regulator in modern vehicles to optimize charging and reduce electrical load when necessary.

UNIT – 4

1. **What is the primary function of a throttle position sensor (TPS)?**

   To monitor the position of the throttle valve and send this information to the engine control unit (ECU).

2. **Name a common type of temperature sensor used in vehicles.**

   Thermistor.

3. **What is the purpose of an oxygen sensor (O2 sensor) in an engine's exhaust system?**

   To measure the amount of oxygen in the exhaust gases and help the ECU optimize the air-fuel mixture.

4. **How does a mass airflow (MAF) sensor contribute to engine performance?**

   It measures the amount of air entering the engine, allowing the ECU to adjust the fuel injection accordingly.

5. **What does an ABS wheel speed sensor detect?**

   The rotational speed of each wheel to help prevent wheel lockup during braking.

6. **Describe the function of a crankshaft position sensor.**

   It monitors the position and rotational speed of the crankshaft to ensure proper timing of fuel injection and ignition.

7. **What type of signal is typically output by a hall effect sensor?**

   A digital signal.

8. **What role does a camshaft position sensor play in engine management?**

   It provides information about the position of the camshaft for precise timing of the fuel injection and ignition.

9. **What does a knock sensor detect, and why is it important?**

   It detects engine knocking (pre-ignition) and allows the ECU to adjust the ignition timing to prevent damage.

10. **What is the function of a fuel injector?**

    To deliver a precise amount of fuel into the combustion chamber at the correct time.

11. **How does an idle air control (IAC) valve regulate engine idle speed?**

    By controlling the amount of air that bypasses the throttle plate, thus adjusting the engine's idle speed.

12. **What is the purpose of an exhaust gas recirculation (EGR) valve?**

    To reduce nitrogen oxide (NOx) emissions by recirculating a portion of the exhaust gases back into the intake manifold.

13. **What does a MAP (manifold absolute pressure) sensor measure?**

    The pressure within the intake manifold to determine engine load.

14. **How does a vehicle's ECU use data from the coolant temperature sensor?**

    To adjust the fuel mixture and ignition timing based on the engine's operating temperature.

15. **What is the function of a vehicle speed sensor (VSS)?**

    To measure the speed of the vehicle and provide this information to various systems like the speedometer, cruise control, and ECU.

UNIT – 5

1. **What is the primary function of the Engine Management System (EMS)?**

    To control the engine's operation, ensuring optimal performance, fuel efficiency, and emission control.

2. **What role does the ECU (Engine Control Unit) play in EMS?**

    It processes data from various sensors to adjust fuel injection, ignition timing, and other engine parameters.

3. **What is the purpose of the OBD-II system in modern vehicles?**

    To monitor and report on the health of various vehicle systems, enabling diagnostics and emissions control.

4. **What does the 'Check Engine' light indicate in relation to the OBD system?**

    It signals that the OBD system has detected a malfunction or issue within the engine or emissions control systems.

5. **What is the function of an immobilizer in a vehicle security system?**

    To prevent the engine from starting without the correct key or authentication device, thereby deterring theft.

6. **How does a car alarm system enhance vehicle security?**

   By emitting loud sounds and flashing lights when unauthorized access or movement is detected.

7. **What does the Tire Pressure Monitoring System (TPMS) alert the driver about?**

   It warns the driver when tire pressure is too low or too high, which can affect vehicle safety and performance.

8. **What is the role of the electronic stability control (ESC) warning light?**

   To indicate a problem with the vehicle's stability control system, which helps prevent skidding and loss of control.

9. **What are the main features of a vehicle's infotainment system?**

   Entertainment (radio, music, video), navigation, hands-free calling, and connectivity options like Bluetooth and Wi-Fi.

10. **What is telematics, and how is it used in modern vehicles?**

    Telematics is the integration of telecommunications and informatics to provide services such as GPS navigation, vehicle tracking, and remote diagnostics.

11. **What advantages do digital dashboards offer over traditional analog dashboards?**

    Enhanced visibility, customizable displays, and the ability to integrate more information and features.

12. **What information is typically displayed on a Heads-Up Display (HUD) in modern vehicles?**

    Key driving data such as speed, navigation directions, and alerts projected onto the windshield.

13. **How does the Advanced Driver Assistance System (ADAS) integrate with the EMS and telematics?**

    ADAS uses sensors and cameras to assist with driving tasks, and it communicates with the EMS and telematics for real-time adjustments and data reporting.

14. **What is the role of a Vehicle Security and Tracking System (VSTS) in a modern car?**

    To monitor the vehicle's location, provide anti-theft features, and allow for remote tracking and control via telematics.

15. **How do Over-The-Air (OTA) updates benefit the EMS and infotainment systems?**

OTA updates allow manufacturers to remotely update software, fix bugs, and improve functionality without needing a service visit.