NARSIMHA REDDY ENGINEERING COLLEGE
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UNIT II: Cooling, Ignition, and Electrical Systems

Multiple Choice Questions (MCQs)

1. Why is a pressurized radiator cap utilized in modern liquid cooling systems?

   a) To lower the water pump power consumption

   b) To elevate the boiling point of the coolant and prevent vapor lock

   c) To lower the operating temperature to room temperature

   d) To increase the viscosity of antifreeze solutions

2. Which type of liquid cooling system operates entirely on natural density differences without a mechanical pump?

   a) Forced circulation system

   b) Thermosyphon system

   c) Evaporative cooling system

   d) Pressure-sealed system

3. What is the role of a bypass valve or passage within a cooling system thermostat?

   a) To drain the radiator when it is full

   b) To route coolant back into the engine block instead of the radiator when the engine is cold

   c) To relief steam pressure directly to the exhaust pipe

   d) To mix antifreeze with pure water automatically

4. Ethylene glycol is added to water in automotive cooling systems to act as an:

   a) Anti-foaming agent only

   b) Antifreeze and boiling-point elevator solution

c) Octane booster

d) Electrolyte booster

5. In a conventional battery ignition system, what converts the 12-volt battery supply into the high voltage needed for a spark plug?

   a) Condenser

   b) Contact breaker points

   c) Ignition coil (Auto transformer)

   d) Alternator rectifier

6. The primary purpose of a condenser (capacitor) wired in parallel with the contact breaker points is to:

   a) Distribute high voltage to the cylinders in sequence

   b) Prevent arcing across the opening points and accelerate the magnetic field collapse

   c) Delay the spark to prevent knocking

   d) Store power for the starting motor

7. Which ignition system does not rely on an external battery because it creates low-voltage electricity via internal permanent magnets?

   a) Battery coil ignition system

   b) Magneto coil ignition system

   c) Electronic distributorless system

   d) Capacitive Discharge Ignition (CDI) with battery

8. Electronic ignition systems that utilize non-contact triggers often rely on which physical mechanism to sense engine position?

   a) Friction contacts

   b) Hall effect or optical sensors

   c) Hydraulic pressure drops

   d) Centrifugal weights only

9. The vacuum advance mechanism shifts ignition timing based on changes in:

a) Engine speed (RPM)

b) Engine load (intake manifold vacuum)

c) Ambient atmospheric temperature

d) Battery voltage

10. What automotive component converts mechanical energy into alternating current (AC) and then uses diodes to output direct current (DC) for charging?

    a) Dynamo / DC generator

    b) Alternator

    c) Solenoid switch

    d) Bendix drive

11. The current-voltage regulator in a vehicle charging circuit prevents:

    a) The vehicle from going into reverse accidentally

    b) Overcharging of the battery and burning out of consumer circuits at high RPMs

    c) Fuel starvation at low speeds

    d) Engagement of the starter motor while the engine is running

12. The starter motor engagement system that uses an inertial pinion on a helical splined shaft to engage the flywheel is the:

    a) Overrunning clutch drive

    b) Bendix drive mechanism

    c) Solenoid shift lever drive

    d) Constant mesh drive

13. What is the dual purpose of the solenoid switch in a pre-engaged starter motor system?

    a) Rectifies AC current and regulates field voltage

    b) Acts as a high-current relay and mechanically shifts the pinion into the flywheel ring gear

    c) Measures engine temperature and oil levels

d) Powers the wiper motor and the horn simultaneously

14. Which dashboard indicator operates using a thermistor whose electrical resistance drops as engine temperatures rise?

    a) Fuel gauge

    b) Oil pressure gauge

    c) Engine temperature indicator

    d) Tachometer

15. What type of fan clutch engages and disengages based on the temperature of the air passing through the radiator core?

    a) Rigid mechanical drive fan

    b) Bimetallic strip viscous fan clutch

    c) Direct electric relay fan

    d) Centrifugal weight clutch fan

16. A spark plug heat range denotes its ability to:

    a) Deliver high-voltage currents without short-circuiting

    b) Transfer heat away from the firing tip to the cylinder head

    c) Fire in rich air-fuel environments

    d) Maximize the advance angle under light loads

17. In a down-flow radiator, coolant moves in which direction?

    a) Horizontally from the left tank to the right tank

    b) Vertically from the upper tank to the lower tank

    c) Outward from a central core

    d) Counter-clockwise through concentric coils

18. An engine temperature warning lamp or indicator receives its signal from a sensor located in the:

    a) Radiator bottom tank

    b) Engine cylinder block/head water jacket

c) Exhaust manifold

d) Fuel tank sending unit

19. The sound of an automotive horn is generated by the rapid oscillation of an electromagnetic:

    a) Solenoid plunger

    b) Diaphragm

    c) Bendix spring

    d) Carbon brush

20. A fuel gauge system usually consists of a dashboard receiver and a sending unit located in the fuel tank containing a float connected to a:

    a) Piezoelectric crystals

    b) Variable resistor (rheostat)

    c) Thermocouple

    d) High-voltage transformer

Fill in the Blanks

1. Air-cooled engines feature thin, extended metallic surfaces on their cylinders called _____ to increase heat dissipation area.
2. The component that opens or closes access to the radiator to maintain optimal engine operating temperature is the _____.
3. A _____ radiator has its tanks located on the sides, allowing for a lower vehicle hood silhouette.
4. The radiator cap contains a _____ to release excessive steam and a _____to let air or coolant in as the system cools.
5. In an ignition coil, the _____winding consists of thousands of turns of very fine wire to generate the high output voltage.
6. The mechanical switch that continuously interrupts current flow in the primary ignition circuit is called the_____.
7. The process of ignition occurring too early, before the ideal spark timing, is called _____.
8. _____ mechanisms use spring-loaded weights to advance spark timing as engine speed increases.
9. A _____utilizes the inertia of a pinion gear to automatically mesh it with the engine flywheel ring gear.
10. The electrical unit that converts mechanical power to electrical power in older cars using a commutator and brushes is a_____.
11. An _____ uses a set of internal silicon diodes to rectify AC power into DC power.

12. The component that uses a small electric motor and a worm gear reduction linkage to sweep across a windshield is the _____.
13. If an engine's oil pressure drops dangerously low, a pressure switch closes to light up the _____ on the dashboard.
14. The insulation jacket around a spark plug's center electrode is made of high-grade _____.
15. In an electronic ignition system, a _____replaces the mechanical contact breaker points to handle the primary circuit switching.
16. The _____is the sequence in which the spark plugs ignite the fuel-air mixtures in different cylinders of a multi-cylinder engine.
17. A cooling system where steam is captured, condensed, and returned to the circuit without fluid loss is called an _____cooling system.
18. The water pump in an automotive engine cooling system is typically a _____ type pump.
19. The _____ of a lead-acid battery can be checked by measuring the specific gravity of its electrolyte using a hydrometer.
20. A _____is placed within electrical circuits to act as a sacrificial link that melts and interrupts current during an over current fault.