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39	A	B	C	D	E

PRACTICE QUESTIONS

National Inspection Testing and Certification Corporation

SHVM

STAR HVACR Mastery B

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for National Inspection Testing and Certification Corporation **SHVM**, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, **SHVM**
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

QUESTION 1 SINGLE CHOICE

In the vapor-compression refrigeration cycle, which component is responsible for converting the high-pressure, high-temperature refrigerant vapor into a high-pressure liquid?

- ☐ A Compressor
- ☒ B Condenser
- ☐ C Metering device
- ☐ D Evaporator

ANSWER B

WHY The condenser removes heat from the high-pressure, high-temperature vapor discharged by the compressor, causing it to condense into a high-pressure, high-temperature liquid. The compressor raises the pressure of the vapor; the metering device reduces pressure to the low side; and the evaporator absorbs heat to boil the refrigerant back into a vapor.

QUESTION 2 SINGLE CHOICE

Which classification best describes R-410A with respect to its composition and flammability?

- ☐ A Azeotropic blend of HCFCs with low flammability
- ☒ B Zeotropic blend of HFCs with low flammability
- ☐ C Pure HFC refrigerant with high flammability
- ☐ D Zeotropic blend of HFOs with high flammability

ANSWER B

WHY R-410A is a zeotropic (non-azeotropic) blend of two HFCs—R-32 and R-125. It is classified as A1, meaning low toxicity and low flammability, and it does not contain any chlorine, so it has zero ozone depletion potential (ODP). It is commonly used as an R-22 replacement in residential and light commercial air conditioning and heat pump systems.

QUESTION 3

SINGLE CHOICE

A technician is about to discharge a start/run capacitor in a residential air-conditioning unit before handling it. Which procedure is the safest and most appropriate way to discharge the capacitor?

- ☐ A Short the two terminals together with a metal screwdriver
- ☒ B Place an insulated bleed resistor across the terminals and wait for it to safely dissipate the charge
- ☐ C Connect a jumper wire from one terminal to the unit's copper refrigerant line
- ☐ D Discharge it by tapping the terminals with an insulated pliers while the unit is powered on

ANSWER B

WHY An insulated bleed resistor (often called a capacitor discharge tool) is the recommended method. It safely bleeds the stored charge without producing a damaging, uncontrolled spark or arc. Using a metal screwdriver across the terminals can produce a violent arc, damage the capacitor, and present a burn and shock hazard. Discharging to a refrigerant line is unsafe and ineffective, and the unit must be powered off and locked out before any discharge.

QUESTION 4

SINGLE CHOICE

A technician connects a manifold gauge set to a working R-410A air-conditioning system operating in the cooling mode. Under normal, healthy conditions, what should the typical low-side gauge reading approximate?

- ☐ A Approximately 0 psig for a low-temperature refrigeration system
- ☒ B Approximately 70 psig, which corresponds to a saturation temperature near 40°F
- ☐ C Approximately 250 psig, which corresponds to the system's high-side pressure
- ☐ D Approximately 400 psig, which is the system's high-side saturation pressure

ANSWER B

WHY For a properly charged R-410A air-conditioning system, the low-side saturation temperature should be roughly 40°F (about 4°C), which corresponds to a low-side gauge pressure near 70 psig. A reading near 0 psig suggests a low charge or a leak. 250 psig and 400 psig represent high-side readings, not low-side.

QUESTION 5

SINGLE CHOICE

An air handler's blower motor is running, the contactor is pulled in, but the compressor is not running and there is no hum from the compressor. The line voltage at the compressor terminals is at the rated voltage. Which is the most likely cause?

- ☐ A The contactor coil is open
- ☐ B The run capacitor has failed
- ☒ C The compressor motor has an open winding or a failed internal protector
- ☐ D The thermostat is calling for heat instead of cool

ANSWER C

WHY With correct line voltage present at the compressor terminals and the contactor engaged, a silent compressor with no hum indicates the compressor itself is not completing a circuit internally. A failed internal overload protector or an open motor winding would prevent the compressor from starting despite proper voltage. If the contactor coil were open, voltage would not be present at the terminals. A failed run capacitor would typically produce a hum with attempted (but unsuccessful) starting. A thermostat calling for heat would de-energize the compressor circuit entirely in cooling mode but not produce the symptom of voltage present with no operation.

QUESTION 6

SINGLE CHOICE

Which mode of heat transfer is primarily responsible for moving thermal energy from the warm indoor air to the refrigerant in a typical evaporator coil?

- ☐ A Conduction through the coil fins only
- ☐ B Radiation from the warm air to the cool coil
- ☒ C Convection from the warm air to the coil surfaces combined with conduction through the coil walls to the refrigerant
- ☐ D Convection from the refrigerant to the warm air

ANSWER C

WHY Heat moves from the warm indoor air to the refrigerant through a combination of convection and conduction: warm air convects across the coil fins and tubes (carrying heat to the cold surfaces), and the heat then conducts through the metal tube walls into the refrigerant inside, where it boils the refrigerant. Radiation is negligible at HVAC temperatures, and heat flows from warm to cool—never from refrigerant to warm air in cooling mode.

QUESTION 7

SINGLE CHOICE

Section 608 of the Clean Air Act requires that before opening an air-conditioning or refrigeration system for service, the technician must:

- ☐ A Vent the refrigerant to the outdoors
- ☒ B Recover the refrigerant using EPA-approved recovery equipment into an approved recovery cylinder
- ☐ C Burn the refrigerant in an approved torch to break it down
- ☐ D Dump the refrigerant into a permanent on-site storage container without documentation

ANSWER B

WHY Under EPA Section 608 regulations, refrigerants must be recovered (not vented) using certified recovery equipment and transferred into an approved recovery cylinder before the system is opened. Intentional venting, burning, or improper disposal of regulated refrigerants is prohibited and can result in significant fines.

QUESTION 8

SINGLE CHOICE

Which personal protective equipment (PPE) item is most important to wear when brazing copper refrigerant lines to protect the eyes from harmful infrared and ultraviolet radiation?

- ☐ A Standard safety glasses with side shields
- ☒ B A shaded welding helmet or brazing goggles with the proper filter shade number
- ☐ C Chemical splash goggles
- ☐ D A standard dust mask

ANSWER B

WHY Brazing produces intense visible light, infrared (IR), and ultraviolet (UV) radiation that can cause 'welder's flash' (photokeratitis) and long-term eye damage. Standard safety glasses are not sufficient. A shaded welding helmet or brazing goggles with an appropriate filter shade (typically shade 3–5 for brazing) must be worn. Chemical splash goggles protect against liquid splashes, not IR/UV radiation, and a dust mask addresses respiratory hazards—not eye hazards.

QUESTION 9

MULTIPLE CHOICE

Which of the following components are typically found in a forced-air gas furnace? (Choose two.)

- ☒ A Burner assembly with gas valve
- ☐ B Heat exchanger
- ☐ C Compressor
- ☒ D Induced-draft blower (draft inducer)

ANSWER A • D

WHY A forced-air gas furnace uses a burner assembly with a gas valve to deliver and ignite the fuel, and an induced-draft blower (draft inducer) to vent combustion products and establish the proper draft through the heat exchanger. The heat exchanger transfers combustion heat to the airstream without allowing combustion gases to mix with the indoor air. A compressor is not part of a gas furnace; it is a refrigeration-system component.