

PVNGS TRAINING DEPARTMENT  
EXAMINATION COVER SHEET



**Section I (PARTICIPANT) Please Complete Section I Using BLACK INK**

_____	_____	_____	_____
S.S.N.	Last Name	First Name	MI
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Contractor Affiliation	APS Contact Person	Unit No	Date

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**Section II (INSTRUCTOR or LEADER)**

Exam No: NMH10X00105	Course No: NMH10	Section No: _____
Course Title: A/C Units		Date: 01/13/2005
_____	_____	_____
Technical Review/Date:		Training Leader/Date:

**Section III (INSTRUCTOR)**

Pass _____	Score: _____ %	Scored by: _____
Fail _____		Name _____ Signature _____

**Section IV (INSTRUCTOR)**

<b>ADDITIONAL COMMENTS, INSTRUCTIONS, OR GRADING INFORMATION</b>

## NMH10X00105 TEST BANK

1

What is the purpose of the CO<sub>2</sub> storage system (M-FPNX01)?

- A. designed to store 7.5 tons of CO<sub>2</sub>
- B. designed to maintain the CO<sub>2</sub> at 0°F and 300 psig
- C. provides physical storage of the carbon dioxide
- D. all of the above

Answer: D

2

In addition to fire protection, the unit also serves as a storage facility for CO<sub>2</sub> used in

- A. main generator purging.
- B. steam generator purging.
- C. filling portable CO<sub>2</sub> bottles.

Answer: A

3

Which one of the following controls the refrigeration system operation?

- A. CO<sub>2</sub> tank temperature
- B. CO<sub>2</sub> tank pressure
- C. expansion valve setting
- D. manually operated

Answer: B

## NMH10X00105 TEST BANK

4

The expansion valve is set to maintain approximately 5 psi in the evaporator coil.

Answer: True

5

When the tank pressure raises to 341psi, which valve will open and allow a small amount of carbon dioxide vapor to escape to the atmosphere.

- A. the refrigerant safety bleeder valve
- B. the safety relief valve
- C. the manual safety relief valve
- D. the safety bleeder

Answer: D

6

What condition(s) could cause the CO<sub>2</sub> tank pressure to exceed the set point?

- A. low carbon dioxide level in the storage tank
- B. high ambient temperature
- C. long duration of refrigerant system in-operability
- D. both b & c

Answer: D

7

At hot times of the year, it's okay to remove the access panels on the CO<sub>2</sub> unit.

Answer: True

8

When performing maintenance that will cause the refrigeration system to become inoperative for extended periods of time, notify:

- A. Team Leader
- B. Section Leader
- C. both a & b
- D. fire department & control room supervisor

Answer: D

9

The temperature controller is set for \_\_\_\_\_°F.

- A. 70°F
- B. 75°F
- C. 80°F
- D. 85°F

Answer: B

10

When is the excitation cubicle ACU required to be operating?

- A. Mode 4 before Generrex field flash
- B. Mode 3 after Generrex field flash
- C. Mode 2 before Generrex field flash
- D. Mode 1 after Generrex field flash

Answer: D

**11**

Which one of the following best describes the environment that the HVAC Technician is exposed to when servicing the Generex ACU:

- A. possible high ambient temperatures
- B. possible high noise area
- C. plant trip hazard
- D. all of the above

Answer: D

**12**

The Generex ACU will be out of service for an extended period of time, when should temporary cooling be installed on the Generex cubicle?

- A. any time the ACU is not operating
- B. during high ambient temperature conditions
- C. only when the work order calls for it to be installed
- D. when the Unit is in Mode 2

Answer: B

**13**

Which one of the following best describes the purpose of the air starting system?

- A. designed to cool the air in the starting air system
- B. designed to dehumidify the air in the diesel building
- C. designed to remove the moisture from the air in the diesel generator
- D. designed to reduce water vapor in the starting air supply

Answer: D

**14**

How long do the starting air dryers have to be running before Operations will start the associated air compressor?

- A. at least 1 hour
- B. at least 1 ½ hours
- C. at least 2 hours
- D. at least 2 ½ hours

Answer: C

**15**

Refrigerant flow in the evaporator is controlled by:

- A. capillary tube
- B. float valve
- C. expansion tube orifice
- D. expansion valve

Answer: D

**16**

Which one of the following devices allows the air dryer to maintain continuous machine operation from maximum load to non-load without reduction of evaporator temperature?

- A. defrost timer
- B. reversing valve
- C. hot gas bypass
- D. paragon timer

Answer: C

**17**

The starting air dryer consists of two complete and independent systems. One compressed air system and one refrigeration system.

Answer: True

**18**

As a result of recent modifications there are different models of starting air dryers presently being used. The main differences between the models are the type of moisture separator, the location of the piping connections and:

- A. the refrigerant used
- B. compressor motor horsepower
- C. the condenser coil capacity
- D. both a & b

Answer: D

**19**

On the Ultra Air dryer the refrigerant analyzer pressure is normally 33-35 psig. Under what condition could the acceptable suction pressure reach as high as 54 psig?

- A. if the compressed air temperature is above 90°F
- B. if ambient temperature is above 100°F
- C. if only one dryer is operating
- D. 54 psig is never acceptable

Answer: B

**20**

To prevent a loss of charge when checking the refrigerant charge it is recommended to:

- A. use a manifold gauge set
- B. use a manifold gauge set with no loss connectors
- C. use the refrigerant gauge that is installed on the air dryer
- D. front seat the service valve when checking the charge

Answer: C

**21**

You are performing retest on the starting air dryer and find a problem that requires the dryer to be shut down. What should you do next?

- A. shut the air dryer down if it is not operating properly
- B. notify the Control Room immediately
- C. go to tagging and get a clearance to shut it off
- D. notify you Team Leader

Answer: B

**22**

Where are the remote multiplexing terminals located?

- A. at each cooling tower
- B. in the switchyard
- C. in the service building
- D. both a & b are correct

Answer: D



23

The purpose of the PMUX/multiplexer A/C unit is to provide cooling for the heat sensitive equipment inside the non-quality RMT electrical enclosure.

Answer: True

24

The switchyard multiplexer cabinet is equipped with:

- A. Room-type A/C with a set point of 75°F
- B. a Carrier single package heat pump with a set point of 75°F
- C. a high ambient A/C unit with a set point of 80°F
- D. both a & c are correct

Answer: D

25

The purpose of the gas turbine control room A/C unit is to cool:

- A. the water rec facility
- B. the switchyard control panel
- C. the gas turbine control room
- D. both b & c are correct

Answer: C

**26**

Unit will alarm in the Unit 1 Control Room when temperatures reach:

- A. 70F
- B. 80F
- C. 90F
- D. 32 degrees Kelvin

Answer: C

**27**

The Gas Turbine Control Room may need temporary cooling:

- A. When the temperature inside rises to 90F
- B. When the temperature inside rises to 80 F
- C. When the temperature inside rises to 85 F
- D. When the temperature inside rises to 88 F

Answer: A

**28**

A tagging clearance is required on the Gas Turbine Control Room AC. Who issues the tagging permit and who may sign on?

- A. Water Rec issues the permit, anyone can sign on.
- B. Unit 1 Tagging issues the permit, anyone qualified in Tagging can sign on.
- C. Water Rec issues the permit, anyone qualified in Tagging can sign on.
- D. Water Rec issues the permit, only your team leader can sign on.

Answer: C

1. What is the purpose of the PAMU (JSQNC04)?

- A. to house the post accident radiation monitors in a clean, cool environment
- B. to maintain 70° F internal temperature with 120° F external temperature
- C. both a & b are correct
- D. neither a or b are correct

Answer: C

Why is the required cabinet temperature set point no higher than 75°F?

- A. the technicians who work on the micro-computers housed within the PAMU need the cabinet cooler
- B. the cabinet that the micro-computers are housed in is not very well insulated
- C. 75°F is the coldest that the air conditioners can cool the cabinet to
- D. the calibration of the micro-computers housed within the PAMU are referenced to performance at 72°F

Answer: D

**31**

What device activates the control circuit to the backup A/C unit in the event of a failure of the primary unit.

- A. an alternate timer
- B. A paragon timer
- C. a paragon switching relay
- D. duct mounted temperature controllers (DA #1 and DA #2)

Answer: D

**32**

The duct mounted temperature controllers sense the discharge air of the alternate unit. The controllers are set \_\_\_°F below the thermostat setting.

- A. 10 °F
- B. 9 °F
- C. 7 °F
- D. 5 °F

Answer: D

**33**

What device is used to initiate alternate operation, lead or lag status of the second A/C unit.

- A. a paragon timer
- B. an alternate timer
- C. a duct mounted temperature controller, DA #1 or DA #2
- D. a paragon switching relay

Answer: A

34

What condition will cause the local alarm to sound?

- A. in the event of a failure of the post accident monitoring system
- B. in the event of a failure of the secondary unit
- C. in the event of a failure of both the primary unit and backup unit
- D. in the event of a failure of the primary unit

Answer: D

35

What could happen if the air conditioning failed to maintain the PAMU cabinet within the required temperature range for an extended period of time during high ambient temperatures?

- A. the local alarm will continue to sound until the air conditioning is restored
- B. nothing the (RU) micro-computer and its associated equipment are rated at 120°F
- C. the technicians who work on the micro-computers housed within the PAMU will not be able to work on the equipment
- D. may cause the (RU) micro-computer and its associated equipment to fail

Answer: D

Unit #1 is in the cooling mode, but not cooling, what will happen next to energize the time delay?

- A. DA #1 contacts close R to W
- B. DA #1 contact close R to W
- C. switching relay contact open R to W
- D. DA #2 contact close R to W

Answer: B

What could happen if the air conditioning failed to maintain the PAMU cabinet within the required temperature range for an extended period of time during high ambient temperatures?

- A. nothing the (RU) micro-computer and its associated equipment are rated at 120°F
- B. the technicians who work on the micro-computers housed within the PAMU will not be able to work on the equipment
- C. may cause the (RU) micro-computer and its associated equipment to fail
- D. the local alarm will continue to sound until the air conditioning is restored

Answer: C

**38**

If the heat input to the CO<sub>2</sub> storage tank is abnormally high and causes the tank pressure to rise rapidly which one of the following valves has the capacity to arrest tank pressure rise even at very high outside temperatures?

- A. the refrigerant safety bleeder valve is set to lift at 295psi.
- B. the storage tank safety bleeder valve is set to lift at 341psi
- C. the safety relief valve is set to lift at 357psi.
- D. None of the above

Answer: C

**39**

Why was an air conditioning unit installed on the excitation cubicle?

- A. to cool the exciter housing
- B. heat and age related stresses on the electronic equipment inside the cabinet caused numerous malfunctions
- C. to help reduce the load on the turbine building ventilation
- D. to increase the efficiency of the generator

Answer: B

**40**

What is the purpose of the excitation cubicle ACU?

- A. to cool the exciter housing
- B. to help reduce the load on the turbine building ventilation
- C. to increase the efficiency of the generator
- D. maintains the cabinet temperature within a normal operating range to extend the life of the components.

Answer: D

41

When the Kellogg- American dryer is placed into service, the red (high temperature) warning light will illuminate for the first 2-3 minutes of operation. What temperature does this switch sense?

- A. the outside air temperature coming into the dryer
- B. the liquid line temperature
- C. the suction line temperature
- D. the temperature of the air in the air receiver

Answer: C

42

Which model air dryer is not equipped with a high temperature warning light?

- A. Ultra Air dryer
- B. Kellogg- American
- C. Comp Air- Kellogg Model

Answer: C



To continue the start sequence for A/C unit #1 after the paragon timer contacts close what two things must take place?

- A. the temperature in the cabinet rises above the set point and the temperature in the discharge duct of A/C #2 rises above the set point
- B. the temperature in the cabinet rises above the set point and the temperature in the discharge duct of A/C #1 rises above the set point
- C. the temperature in the cabinet rises above the set point and the time delay times out
- D. time delay times out and the temperature in the discharge duct of A/C #2 rises above the set point

Answer: B

The cooling tower multiplexer is equipped with a G.E. direct expansion air conditioner, what is the set point?

- A. Room-type A/C with a set point of 75°F
- B. High ambient A/C with a set point of 80°F
- C. Carrier single package heat pump with a set point of 75°F
- D. both a & c are correct

Answer: A

45

Who must be notified before entering the switchyard?

- A. Unit 2 operations
- B. Unit 3 operations
- C. Switchyard operations
- D. Unit 1 operations

Answer: D

46

While servicing a Multiplexer A/C Unit you determine that the equipment requires major repairs, what is the acceptable alternative?

- A. the A/C unit can be replaced with any A/C unit that has similar mounting configuration
- B. the A/C unit cannot be replaced without a plant modification
- C. the A/C unit can be replaced as specified in Specification 13-MN-598B Table 5-1
- D. both a & b are correct

Answer: C

47

The purpose of the gas turbine control room A/C unit is to cool the control room between:

- A. 70F-80F
- B. 65C-80C
- C. 65F-80F
- D. 32 degrees Kelvin

Answer: C

**48**

The Gas Turbine Control Room A/C Unit cools the Gas Turbine control room, which contains:

- A. Control panels, MCC
- B. Batteries, MCC, Switchgear, and Control panels
- C. Switchgear, MCC, and Control panels
- D. MCC, Switchgear, and Batteries

Answer: B

**49**

The control panel, located inside the PAMU, provides the following features; normal operation of the primary unit and:

- A. a safety switch to prevent the second unit from starting until the first one shuts off
- B. alternate operation of the backup unit
- C. a bypass switch to provide operation of the backup unit
- D. an alarm circuit to notify the control room when the primary unit shuts down

Answer: B

**50**

Why is setting the cabinet temperature below 70°F not recommended?

- A. due to possible icing of the indoor coil
- B. the cabinet that the micro-computers are housed in is not very well insulated
- C. 75°F is the coldest that the air conditioners can cool the cabinet to
- D. both a & c are correct

Answer: A