UNITED STATES NUCLEAR REGULATORY COMMISSION
BOILING WATER REACTOR GENERIC FUNDAMENTALS EXAMINATION
JUNE 2011--FORM A

Please Print

Name: _____

Docket No.: _____

Facility: _____

Start Time: _____ Stop Time: _____

INSTRUCTIONS TO APPLICANT

Answer all the test items using the answer sheet provided, ensuring a single answer is marked for each test item. Each test item has equal point value. A score of at least 80 percent is required to pass this portion of the NRC operator licensing written examination. All examination materials will be collected 3 hours after the examination begins. This examination applies to a typical U.S. boiling water reactor (BWR) nuclear power plant.

SECTION	QUESTIONS	% OF TOTAL	SCORE
COMPONENTS	1 - 22		
REACTOR THEORY	23 - 36		
THERMODYNAMICS	37 - 50		
TOTALS	50		

All work performed on this examination is my own. I have neither given nor received aid.

_____

Applicant's Signature

RULES AND INSTRUCTIONS FOR THE NRC
GENERIC FUNDAMENTALS EXAMINATION

During the administration of this examination the following rules apply:

NOTE: The term "control rod" refers to the length of neutron absorber material that can be positioned by the operator to change core reactivity.

NOTE: Numerical answers are rounded to the nearest whole number unless otherwise indicated.

1. Print your name in the blank provided on the cover sheet of the examination.

2. Fill in your individual docket number.

3. Fill in the name of your facility.

4. Fill in your start and stop times at the appropriate times.

5. Two aids are provided for your use during the examination:

   (1) An equations and conversions sheet contained within the examination copy, and

   (2) Steam tables and Mollier Diagram provided by your proctor.

6. Place your answers on the answer sheet provided. Credit will only be given for answers properly marked on this sheet. Follow the instructions for filling out the answer sheet.

7. Scrap paper will be provided for calculations.

8. Cheating on the examination will result in the automatic forfeiture of this examination. Cheating could also result in severe penalties.

9. Restroom trips are limited. Only **one** examinee may leave the room at a time. In order to avoid the appearance or possibility of cheating, avoid all contact with anyone outside of the examination room.

10. After you have completed the examination, sign the statement on the cover sheet indicating that the work is your own and you have neither given nor received any assistance in completing the examination. Either pencil or pen may be used.

11. Turn in your examination materials, answer sheet on top, followed by the examination copy and the examination aids, e.g., steam tables, handouts, and scrap paper.

12. After turning in your examination materials, leave the examination area, as defined by the proctor. If after leaving you are found in the examination area while the examination is in progress, your examination may be forfeited.

GENERIC FUNDAMENTALS EXAMINATION
EQUATIONS AND CONVERSIONS HANDOUT SHEET

EQUATIONS

$\dot{Q} = \dot{m}c_p\Delta T$

$\dot{Q} = \dot{m}\Delta h$

$\dot{Q} = UA\Delta T$

$\dot{Q} \propto \dot{m}^3_{Nat\ Circ}$

$\Delta T \propto \dot{m}^2_{Nat\ Circ}$

$K_{eff} = 1/(1 - \rho)$

$\rho = (K_{eff} - 1)/K_{eff}$

$SUR = 26.06/\tau$

$$\tau = \frac{\bar{\beta}_{eff} - \rho}{\lambda_{eff}\,\rho}$$

$$\rho = \frac{\ell^*}{\tau} + \frac{\bar{\beta}_{eff}}{1 + \lambda_{eff}\,\tau}$$

$\ell^* = 1 \times 10^{-4}$ sec

$\lambda_{eff} = 0.1\ sec^{-1}$ (for small positive ρ)

$DRW \propto \varphi^2_{tip}/\varphi^2_{avg}$

$A = A_0e^{-\lambda t}$

$P = P_o10^{SUR(t)}$

$P = P_oe^{(t/\tau)}$

$CR_{S/D} = S/(1 - K_{eff})$

$CR_1(1 - K_{eff1}) = CR_2(1 - K_{eff2})$

$1/M = CR_1/CR_X$

$A = \pi r^2$

$F = PA$

$\dot{m} = \rho A\vec{v}$

$\dot{W}_{Pump} = \dot{m}\Delta P\upsilon$

$P = IE$

$P_A = \sqrt{3}IE$

$P_T = \sqrt{3}IEpf$

$P_R = \sqrt{3}IE\sin\theta$

Thermal Efficiency = Net Work Out/Energy In

$$\frac{g(z_2 - z_1)}{g_c} + \frac{(\vec{v}_2^{\,2} - \vec{v}_1^{\,2})}{2g_c} + \upsilon(P_2 - P_1) + (u_2 - u_1) + (q - w) = 0$$

$g_c = 32.2$ lbm-ft/lbf-sec^2

CONVERSIONS

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1 Mw = 3.41×10^6 Btu/hr

1 hp = 2.54×10^3 Btu/hr

1 Btu = 778 ft-lbf

°C = (5/9)(°F - 32)

°F = (9/5)(°C) + 32

1 kg = 2.21 lbm

1 ft^3_{water} = 7.48 gal

1 gal_{water} = 8.35 lbm

1 Curie = 3.7×10^{10} dps

QUESTION: 1

Water storage tanks A and B are identical except that tank A receives overpressure protection from an installed relief valve, whereas tank B has an installed safety valve. The relief valve and safety valve have the same pressure setpoint and design flow rate.

Water is continuously added to each tank at the same rate (50 percent of the design flow rate of the relief/safety valve). After the tanks are completely full, tank A pressure will _____; and tank B pressure will _____.

A. fluctuate within a few percent of the pressure setpoint; stabilize slightly above the pressure setpoint

B. fluctuate within a few percent of the pressure setpoint; fluctuate within a few percent of the pressure setpoint

C. stabilize slightly above the pressure setpoint; stabilize slightly above the pressure setpoint

D. stabilize slightly above the pressure setpoint; fluctuate within a few percent of the pressure setpoint

QUESTION: 2

Refer to the drawing of a cooling water system in which both centrifugal pumps A and B are operating (see figure below).

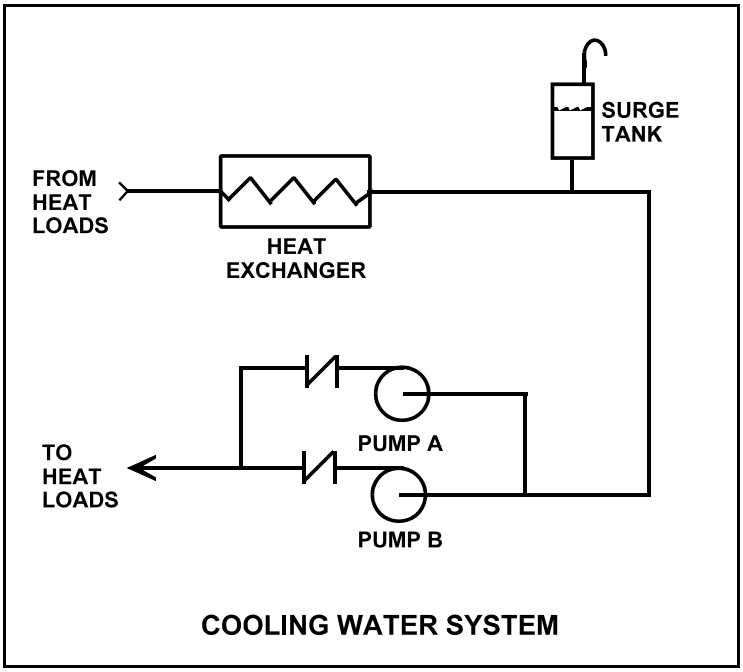
An operator stops pump B, but the pump B check valve fails to close. In comparison to normal operation with only pump A running, operation with the failed pump B check valve will result in pump A flow rate being _____ than normal; and heat exchanger flow rate being _____ than normal.

A. higher; lower

B. higher; higher

C. lower; lower

D. lower; higher



QUESTION: 3

Which one of the following is not a generally accepted method for locally verifying that a valve is open?

A. Observe local flow rate instrumentation.

B. Check the local valve position indicator indicates "open."

C. Turn the valve operator in the "close" direction and verify that some movement occurs.

D. Attempt to turn the valve operator in the "open" direction and verify that no movement occurs.

QUESTION: 4

Refer to the drawing of a frictionless venturi flow element (see figure below). Subcooled water is flowing through the venturi with the following initial conditions:

Flow rate: 500 gpm
Tap A pressure: 40 psia
Tap B pressure: 36 psia

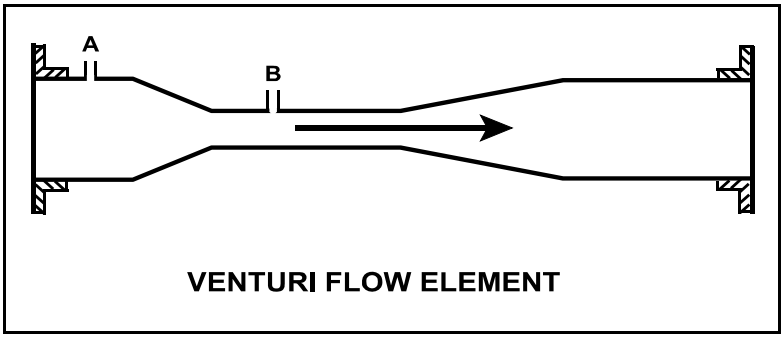
Flow rate increases to 1,000 gpm, which results in a tap A pressure of 68 psia. What is the new pressure at tap B?

A. 60 psia

B. 52 psia

C. 44 psia

D. 32 psia



VENTURI FLOW ELEMENT

QUESTION: 5

Refer to the drawing of four differential pressure (D/P) level detectors (see figure below).

The tanks are identical and are being maintained at 17 psia and 70 percent water level (calibration conditions). They are located in a building that is currently at atmospheric pressure.

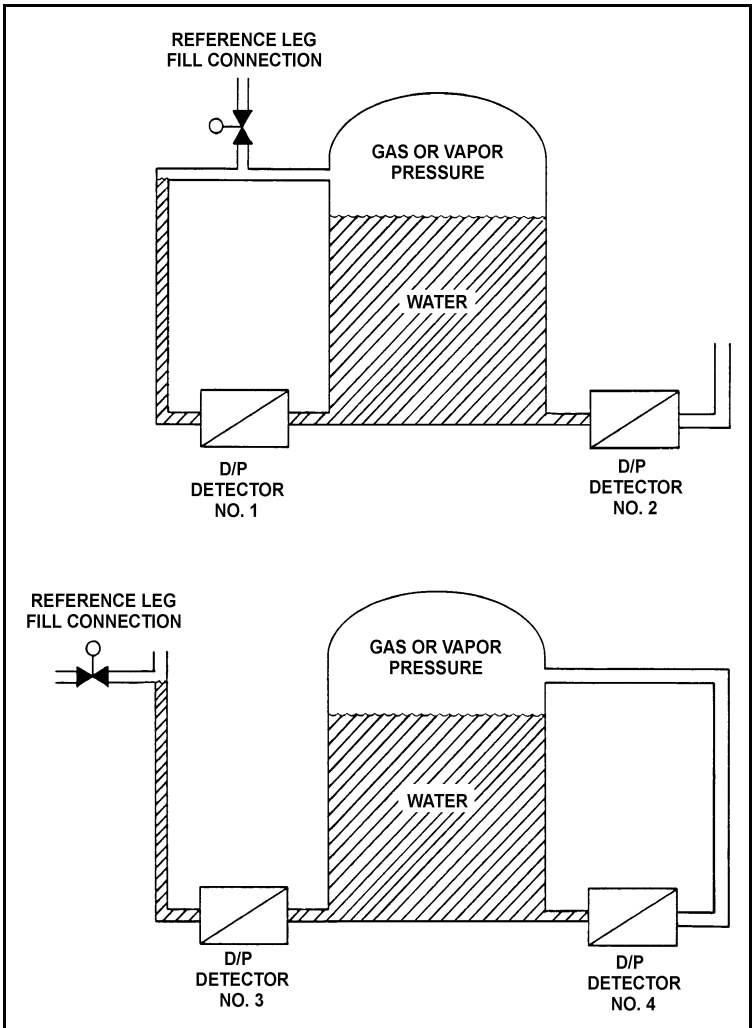
If the building ventilation system creates a vacuum in the building, which level detectors will provide the lowest level indications?

A. 1 and 3

B. 1 and 4

C. 2 and 3

D. 2 and 4



TANK DIFFERENTIAL PRESSURE LEVEL DETECTORS

QUESTION: 6

Which one of the following devices is commonly used to provide remote indication of valve position on an analog meter in units of "percent of full open"?

A. Limit switch

B. Reed switch

C. Linear variable differential transformer

D. Resistance temperature detector

QUESTION: 7

A nuclear plant worker normally wears a thermoluminescent dosimeter (TLD) or similar device for measuring radiation exposure. When a self reading pocket dosimeter (SRPD) is also required, where will the SRPD be worn and why?

A. Below the waist near the TLD to measure radiation from the same source(s).

B. Below the waist away from the TLD to measure radiation from different source(s).

C. Above the waist near the TLD to measure radiation from the same source(s).

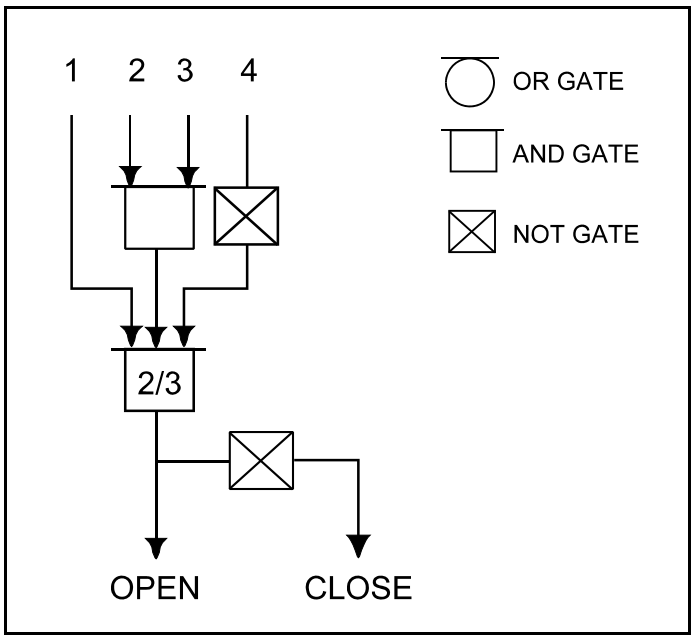
D. Above the waist away from the TLD to measure radiation from different source(s).

QUESTION: 8

Refer to the logic diagram for a valve controller (see figure below).

Which one of the following combinations of inputs will result in the valve receiving a CLOSE signal?

	INPUTS			
	1	2	3	4
A.	On	On	On	On
B.	Off	On	On	On
C.	On	Off	Off	Off
D.	Off	On	On	Off



QUESTION: 9

If the turbine shaft speed signal received by a typical turbine governor control system fails high during turbine startup, the turbine governor will cause turbine speed to...

A. increase, until an upper limit is reached or the turbine trips on overspeed.

B. decrease, until the mismatch with the turbine speed demand signal is nulled.

C. increase, until the mismatch with the turbine speed demand signal is nulled.

D. decrease, until a lower limit is reached or turbine steam flow is isolated.

QUESTION: 10

Which one of the following is an effective method for ensuring that a centrifugal pump remains primed and does not become gas bound during operation and after shutdown?

A. Install the pump below the level of the suction supply.

B. Install a check valve in the discharge piping of the pump.

C. Install an orifice plate in the discharge piping of the pump.

D. Install a pump recirculation line from the pump discharge piping to the pump suction piping.

QUESTION: 11

The current conditions for a centrifugal water pump are as follows:

Pump suction pressure: 140 psia
Pump suction temperature: 300°F

The pump requires a net positive suction head (NPSH) of 150 ft-lbf/lbm for pumping water at 300°F. Which one of the following is the lowest pump suction pressure that will provide the required NPSH for the current conditions?

A. 132 psia

B. 127 psia

C. 73 psia

D. 67 psia

QUESTION: 12

A single-stage (single impeller) centrifugal pump and a two-stage (two impellers) centrifugal pump have identical head-capacity curves. The pumps are connected to identical suction and discharge piping in a water system.

Compared to the single-stage pump, the two-stage pump produces the same flow rate at about _____ pump discharge head; and for the same flow rate, the two-stage pump requires _____ net positive suction head.

A. twice the; less

B. twice the; more

C. the same; less

D. the same; more

QUESTION: 13

A positive displacement pump should be started with its suction valve _____ and its discharge valve _____.

A. throttled; throttled

B. throttled; fully open

C. fully open; throttled

D. fully open; fully open

QUESTION: 14

A centrifugal pump is driven by a single-speed ac induction motor. Pump flow rate is controlled by a throttled discharge flow control valve.

The following initial pump conditions exist:

Pump motor current: 50 amps
Pump flow rate: 400 gpm

What will the resulting pump motor current be if the flow control valve is repositioned such that pump flow rate increases to 800 gpm?

A. 100 amps

B. 200 amps

C. 400 amps

D. Cannot be determined without additional information.

QUESTION: 15

A 120 VDC battery is rated at 800 amp-hours for a continuous 50 KW load. Approximately how long will the fully charged battery be able to supply a continuous 50 KW load before the battery rating is exceeded?

A. 115 minutes

B. 90 minutes

C. 75 minutes

D. 60 minutes

QUESTION: 16

A liquid-to-liquid heat exchanger containing trapped air on the shell side will be less efficient because the air...

A. causes more turbulent fluid flow.

B. increases the differential temperature across the tubes.

C. reduces the fluid contact with the heat transfer surface.

D. causes pressure oscillations.

QUESTION: 17

Refer to the drawing of an operating water cleanup system (see figure below).

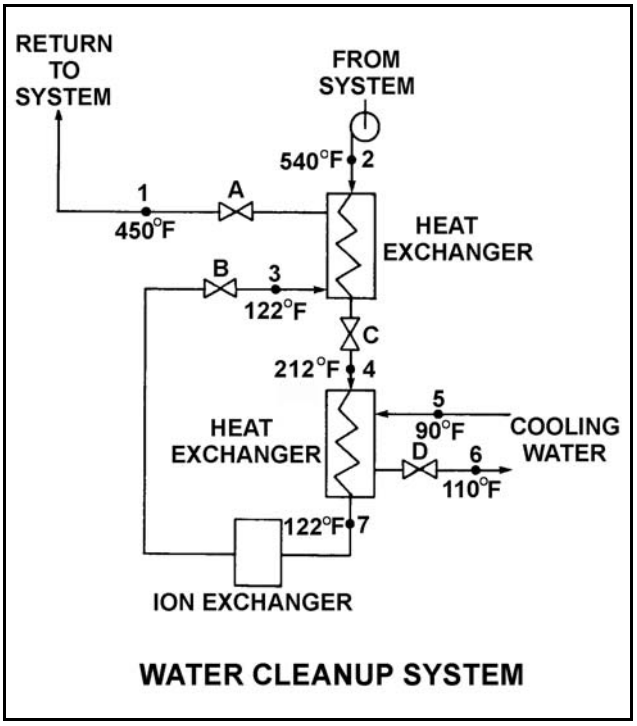
Valves A, B, and C are fully open. Valve D is 80 percent open. All temperatures are as shown. If valve D is then throttled to 50 percent, the temperature at point...

A. 3 will decrease.

B. 4 will increase.

C. 5 will increase.

D. 6 will decrease.



QUESTION: 18

A pressure gauge on a condenser reads 27 inches of mercury (Hg) vacuum. What is the absolute pressure corresponding to this vacuum?

A. 1.0 psia

B. 1.5 psia

C. 13.5 psia

D. 14.0 psia

QUESTION: 19

What percentage of impurities is being removed from the water passing through an ion exchanger if the ion exchanger has a decontamination factor of 25?

A. 75 percent

B. 88 percent

C. 96 percent

D. 99 percent

QUESTION: 20

How does demineralizer differential pressure indicate the condition of a demineralizer resin bed?

A. Low differential pressure indicates flow blockage in the demineralizer.

B. Low differential pressure indicates that the demineralizer resin bed is exhausted.

C. High differential pressure indicates flow blockage in the demineralizer.

D. High differential pressure indicates that the demineralizer resin bed is exhausted.

QUESTION: 21

A typical 120 VAC manual circuit breaker tripped due to overload. To close this circuit breaker the handle must be moved from the...

A. OFF position directly to the ON position; trip latch reset is not required.

B. midposition directly to the ON position; trip latch reset is not required.

C. OFF position to the midposition to reset the trip latch, and then to the ON position.

D. midposition to the OFF position to reset the trip latch, and then to the ON position.

QUESTION: 22

Refer to the drawing of a valve motor control circuit (see figure below) for a valve that is currently fully closed and has a 10-second stroke time.

Note: Limit switch (LS) contacts are shown open regardless of valve position, but relay contacts are shown open/closed according to the standard convention for control circuit drawings.

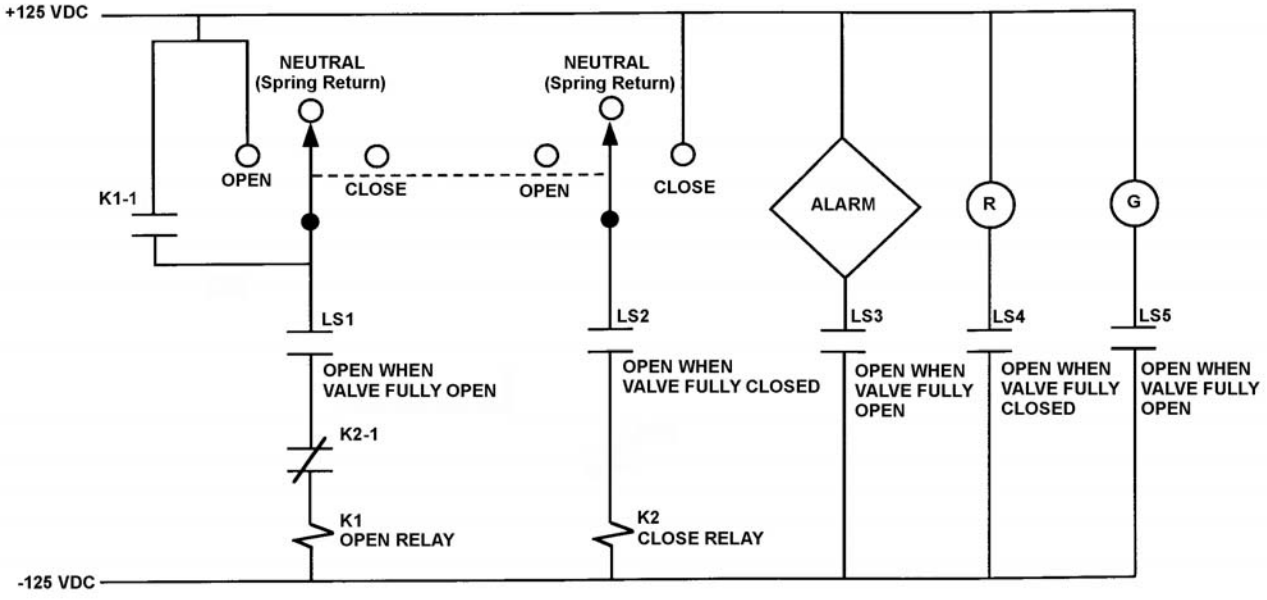
An operator takes the control switch to OPEN momentarily and the valve begins to open. Five seconds later, the operator takes the control switch to CLOSE momentarily and releases the switch. Which one of the following describes the valve response when the control switch is taken to CLOSE momentarily and released?

A. The valve will stop opening and remain partially open.

B. The valve will stop opening and then go fully closed.

C. The valve will open fully and remain fully open.

D. The valve will open fully and then go fully closed.



VALVE MOTOR CONTROL CIRCUIT

QUESTION: 23

In a comparison between a delayed neutron and a prompt neutron produced from the same fission event, the prompt neutron is more likely to... (Assume that both neutrons remain in the core.)

A. cause fast fission of a U-238 nucleus.

B. be captured by a U-238 nucleus at a resonance energy between 1 eV and 1000 eV.

C. be captured by a Xe-135 nucleus.

D. cause thermal fission of a U-235 nucleus.

QUESTION: 24

Twelve hours ago, a nuclear reactor scrammed from 100 percent steady state power due to an instrument malfunction. All systems operated normally. Given the following absolute values of reactivities added since the scram, assign a (+) or (-) as appropriate and choose the current value of core reactivity.

Xenon	= ( ) 2.0% ΔK/K
Fuel temperature	= ( ) 2.5% ΔK/K
Control rods	= ( ) 14.0% ΔK/K
Voids	= ( ) 4.5% ΔK/K

A. -5.0% ΔK/K

B. -9.0% ΔK/K

C. -14.0% ΔK/K

D. -23.0% ΔK/K

QUESTION: 25

Given the following stable initial conditions for a nuclear reactor:

Power level: 1.0×10^{-8} percent
K_{eff} : 0.999
Core $\overline{\beta}_{eff}$: 0.006

What will the stable reactor period be following an addition of positive 0.15 %ΔK/K reactivity to the reactor? (Assume the stable reactor period occurs before the reactor reaches the point of adding heat.)

A. 30 seconds

B. 50 seconds

C. 80 seconds

D. 110 seconds

QUESTION: 26

A nuclear power plant is operating at 70 percent power. Which one of the following will result in a less negative fuel temperature coefficient? (Consider only the direct effect of the change in each listed parameter.)

A. Increase in Pu-240 inventory in the core.

B. Increase in moderator temperature.

C. Increase in fuel temperature.

D. Increase in void fraction.

QUESTION: 27

During a reactor power decrease from steady state 100 percent to steady state 20 percent, the smallest positive reactivity addition will be caused by the change in...

A. void percentage.

B. fuel temperature.

C. xenon concentration.

D. moderator temperature.

QUESTION: 28

If a control rod is moved from position 22 to position 12, it is being...

A. inserted 30 inches.

B. withdrawn 30 inches.

C. inserted 60 inches.

D. withdrawn 60 inches.

QUESTION: 29

Which one of the following describes the change in magnitude (positive value) of integral rod worth during the complete withdrawal of a fully-inserted control rod?

A. Increases, then decreases

B. Decreases, then increases

C. Increases continuously

D. Decreases continuously

QUESTION: 30

A nuclear reactor has been operating at 80 percent power for two months. A manual reactor scram is required for a test. The scram will be followed by a reactor startup with criticality scheduled to occur 24 hours after the scram.

The greatest assurance that xenon reactivity will permit criticality during the reactor startup will exist if the reactor is operated at _____ power for 48 hours prior to the scram and if criticality is rescheduled for _____ hours after the scram.

A. 60 percent; 18

B. 60 percent; 30

C. 100 percent; 18

D. 100 percent; 30

QUESTION: 31

A nuclear reactor has been shut down for seven days following two months of steady state 100 percent power operation. A reactor startup is then performed and the reactor is taken to 100 percent power over a 12-hour period. After 100 percent power is reached, what incremental control rod positioning will be needed to compensate for xenon-135 changes in the core over the next 24 hours?

A. Withdraw rods slowly during the entire period.

B. Withdraw rods slowly at first, then insert rods slowly.

C. Insert rods slowly during the entire period.

D. Insert rods slowly at first, then withdraw rods slowly.

QUESTION: 32

Which one of the following is <u>not</u> a function performed by burnable poisons in an operating nuclear reactor?

A. Provide neutron flux shaping.

B. Provide more uniform power density.

C. Offset the effects of control rod burnout.

D. Allow higher enrichment of new fuel assemblies.

QUESTION: 33

Which one of the following indicates that a nuclear reactor has achieved criticality during a normal nuclear reactor startup?

A. Constant positive period with no control rod motion.

B. Increasing positive period with no control rod motion.

C. Constant positive period during control rod withdrawal.

D. Increasing positive period during control rod withdrawal.

QUESTION: 34

A nuclear reactor is critical and a reactor coolant heat-up is in progress with coolant temperature currently at 140°F. If the point of adding heat is initially 1 percent reactor power, and reactor power is held constant at 3 percent during the heat-up, which one of the following describes the coolant heat-up rate (HUR) from 140°F to 200°F?

A. HUR will initially decrease and then increase.

B. HUR will slowly decrease during the entire period.

C. HUR will slowly increase during the entire period.

D. HUR will remain the same during the entire period.

QUESTION: 35

Which one of the following parameter changes will occur if reactor power is increased from 70 percent to 90 percent by changing recirculation flow?

A. Core void fraction increases.

B. Feedwater temperature decreases.

C. Reactor vessel outlet steam pressure increases.

D. Condensate depression in the main condenser hotwell increases.

QUESTION: 36

A nuclear power plant is initially operating steady-state at 50 percent power when a steam line break occurs that releases a constant 5 percent of rated steam flow. Assume no operator or protective actions occur, automatic pressure control returns reactor pressure to its value prior to the break, and feedwater injection temperature remains the same.

How will reactor power respond to the steam line break?

A. Decrease and stabilize at a lower power level.

B. Increase and stabilize at a higher power level.

C. Decrease at first, then increase and stabilize near the initial power level.

D. Increase at first, then decrease and stabilize near the initial power level.

QUESTION: 37

A water storage tank is vented to atmosphere. The tank is located at sea level and contains 100,000 gallons of water at 80°F. A pressure gauge at the bottom of the tank reads 7.3 psig. What is the approximate water level in the tank?

A. 13 feet

B. 17 feet

C. 21 feet

D. 25 feet

QUESTION: 38

What effect will occur if heat is removed from water that is in a subcooled condition?

A. Quality of the water will increase.

B. Density of the water will decrease.

C. Enthalpy of the water will decrease.

D. Temperature of the water will increase.

QUESTION: 39

A nuclear power plant is operating at 100 percent power. Which one of the following describes how and why main condenser pressure changes when condenser cooling water flow rate increases significantly?

A. Decreases because main condenser saturation (shell) temperature decreases.

B. Decreases because main condenser condensate subcooling increases.

C. Increases because main condenser saturation (shell) temperature decreases.

D. Increases because main condenser condensate subcooling increases.

QUESTION: 40

A nuclear power plant is initially operating at 85 percent reactor power when extraction steam to a high-pressure feedwater heater is isolated. Main generator load is returned to its initial value. When the plant stabilizes, reactor power will be _____ than 85 percent, and overall plant thermal efficiency will be _____.

A. greater; lower

B. greater; higher

C. less; lower

D. less; higher

QUESTION: 41

A nuclear power plant is operating at full power when a 200 gpm reactor coolant leak occurs, which results in a reactor scram and initiation of emergency coolant injection. Reactor vessel pressure stabilizes at 900 psia and all injection pumps are operating with all pump miniflow paths isolated. The shutoff heads for the pumps are as follows:

High pressure coolant injection (HPCI) pumps: 800 psia
Low pressure coolant injection (LPCI) pumps: 200 psia

Which pumps are currently threatened for operability and why?

A. Only the LPCI pumps due to pump overheating.

B. All LPCI and HPCI pumps due to pump overheating.

C. Only the HPCI pumps due to motor overheating.

D. All LPCI and HPCI pumps due to motor overheating.

QUESTION: 42

Refer to the drawing of a venturi in a steam line (see figure below). The venturi inlet and outlet pipe diameters at P1 and P2 are equal.

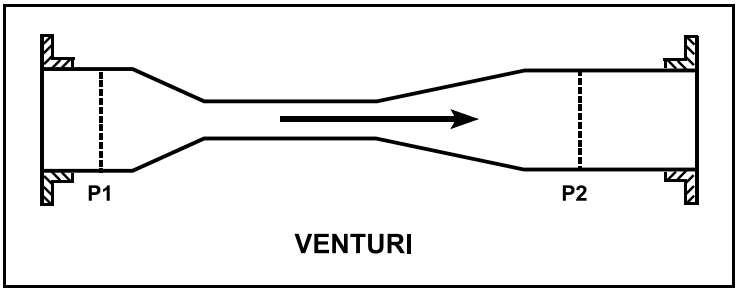
Currently, steam is flowing through the venturi, reaching sonic velocity in the throat of the venturi. If the steam inlet pressure (P1) remains constant while the downstream pressure (P2) decreases, the mass flow rate of the steam will _____; and the velocity of the steam at the venturi outlet will _____.

A. increase; increase

B. increase; remain the same

C. remain the same; increase

D. remain the same; remain the same



QUESTION: 43

When performing a heat balance calculation to determine core thermal power, the measured thermal power is _____ by a value associated with the recirculation pumps; the adjustment is needed because _____ of the flow energy added to the reactor coolant by the recirculation pumps is converted to thermal energy of the reactor coolant.

A. increased; a small fraction

B. increased; nearly all

C. decreased; a small fraction

D. decreased; nearly all

QUESTION: 44

How does the convective heat transfer coefficient vary from the bottom to the top of a fuel rod if subcooled reactor coolant enters the coolant channel and exits as superheated steam?

A. Increases continuously

B. Increases, then decreases

C. Decreases continuously

D. Decreases, then increases

QUESTION: 45

Refer to the drawing of a fuel rod and coolant flow channel at the beginning of a fuel cycle (see figure below).

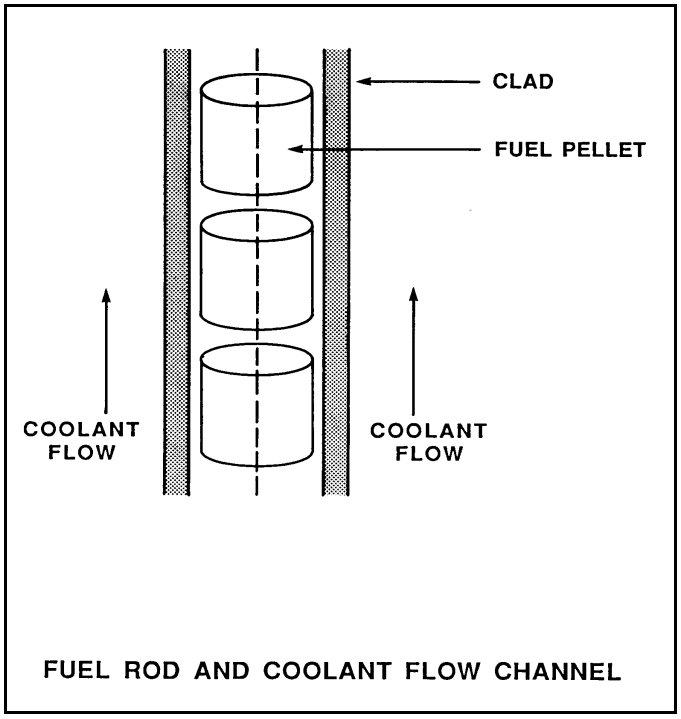
At 100 percent reactor power, the greatest temperature difference in a fuel channel radial temperature profile will occur across the: (Assume the temperature profile begins at the fuel centerline.)

A. fuel pellet centerline to pellet surface.

B. fuel pellet surface-to-clad gap.

C. zircaloy cladding.

D. flow channel boundary (laminar) layer.



FUEL ROD AND COOLANT FLOW CHANNEL

QUESTION: 46

A nuclear reactor is operating at full power when a loss of offsite power results in a reactor scram and a loss of forced core coolant flow. Several minutes later, the development of natural circulation flow will be indicated by differential _____ across the core plate and flow through the _____ pumps.

A. temperature; recirculation

B. temperature; jet

C. pressure; recirculation

D. pressure; jet

QUESTION: 47

A nuclear reactor is operating at 3,400 MW thermal power. The linear heat generation rate (LHGR) limit is 14.7 kW/ft.

Given:

- The reactor core contains 640 fuel bundles.
- Each bundle contains 62 fuel rods, each with an active length of 12.5 feet
- The highest total peaking factors are at the following core locations:

  Location A: 2.4
  Location B: 2.3
  Location C: 2.2
  Location D: 2.1

Which one of the following describes the operating conditions in the core relative to the LHGR limit?

A. All locations in the core are operating below the LHGR limit.

B. Location A has exceeded the LHGR limit while the remainder of the core is operating below the limit.

C. Locations A and B have exceeded the LHGR limit while the remainder of the core is operating below the limit.

D. Locations A, B, and C have exceeded the LHGR limit while the remainder of the core is operating below the limit.

QUESTION: 48

The purpose of maintaining the critical power ratio greater than 1.0 is to...

A. prevent fuel clad cracking during analyzed accident conditions.

B. avoid the onset of transition boiling during expected operating transients.

C. limit peak cladding temperatures to less than 2,200°F during analyzed accident conditions.

D. prevent melting at the fuel pellet centerline during expected operating transients.

QUESTION: 49

How is critical power affected when the axial power distribution in a fuel bundle shifts from bottom-peaked to top-peaked?

A. Critical power decreases to a new lower value.

B. Critical power decreases temporarily, then returns to its initial value.

C. Critical power increases to a new higher value.

D. Critical power increases temporarily, then returns to its initial value.

QUESTION: 50

Which one of the following types of radiation most significantly reduces the ductility of the metal of a reactor pressure vessel?

A. Beta

B. Thermal neutrons

C. Gamma

D. Fast neutrons

***** FINAL ANSWER KEY *****

JUNE 2011 NRC GENERIC FUNDAMENTALS EXAMINATION
BOILING WATER REACTOR - ANSWER KEY

FORM A	FORM B	ANS.	FORM A	FORM B	ANS.
1	15	D	26	40	C
2	16	A	27	41	D
3	17	D	28	42	A
4	18	B	29	43	C
5	19	B	30	44	B
6	20	C	31	45	A
7	21	C	32	46	C
8	22	B	33	47	A
9	23	D	34	48	B
10	24	A	35	49	C
11	25	B	36	50	C
12	26	C	37	1	B
13	27	D	38	2	C
14	28	D	39	3	A
15	29	A	40	4	A
16	30	C	41	5	B
17	31	B	42	6	C
18	32	B	43	7	D
19	33	C	44	8	B
20	34	C	45	9	A
21	35	D	46	10	D
22	36	A	47	11	D
23	37	A	48	12	B
24	38	B	49	13	A
25	39	D	50	14	D