

Unit 9 - Week 7:Thermal Reactors

Course outline

How does an NPTEL online course work?

Week 0 : Prerequisite

Week 1: Fundamentals of Nuclear Power

Week 2 : Radioactivity and nuclear Reactions

Week 3 : Nuclear Fission

Week 4:Chain Reaction in Reactors

Week 5 : Reactor Thermalhydraulics

Week 6:Reactor Control

Week 7:Thermal Reactors

Lec 1:Classical reactor designs

Lec 2:Evolution of reactors from Gen-I to Gen-IV

Quiz : Assessment 7

Feedback form

Week 8:Breeder Reactors

Week 9:Nuclear Fusion

Week 10:Biological Effects of Radiation

Week 11:Reactor Safety & Security

Week 12:Waste Management

Text Transcripts

Download Videos

Books

Assessment 7

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-03-18, 23:59 IST.

1) What material is used as the coolant in LWR? 1 point

- H₂O
 D₂O
 graphite
 liquid Na

No, the answer is incorrect. Score: 0

Accepted Answers: H₂O

2) FBRs don't employ any moderator because 1 point

- they employ high fuel enrichment.
 their energy density is much higher
 they employ fast neutron spectrum for operation.
 liquid Na is strongly reactive to water.

No, the answer is incorrect. Score: 0

Accepted Answers: they employ fast neutron spectrum for operation.

3) The primary function of a pressurizer in PWR is to 1 point

- protect the system from over-pressure.
 maintain required coolant level.
 help in neutron moderation.
 maintain the coolant in subcooled liquid state.

No, the answer is incorrect. Score: 0

Accepted Answers: maintain the coolant in subcooled liquid state.

4) A PWR is working under steady-state with a system pressure of 15 MPa. If 30° subcooling is desirable, the maximum coolant temperature is 1 point

- 563 K
 585 K
 614 K
 647 K

No, the answer is incorrect. Score: 0

Accepted Answers: 585 K

5) During the initial charging period, the desired pressure level inside the pressurizer is commonly attained using nitrogen. If the volume of the pressurizer and temperature of nitrogen is specified, then the pressure can be controlled by controlling the 1 point

- mass of water
 mass of nitrogen
 temperature of water
 partial pressure of nitrogen

No, the answer is incorrect. Score: 0

Accepted Answers: mass of nitrogen

6) A BWR receives saturated liquid water from the recirculation channels. If the system pressure is known, then the power generated through nuclear fission can directly be correlated with 1 point

- recirculation flow rate & exit quality
 recirculation flow rate & exit temperature
 exit temperature & quality
 exit temperature & inlet enthalpy

No, the answer is incorrect. Score: 0

Accepted Answers: recirculation flow rate & exit quality

7) Among the following classical designs, in which one water serves the triple function of moderator, coolant & working fluid? 1 point

- PHWR
 AGR
 PWR
 BWR

No, the answer is incorrect. Score: 0

Accepted Answers: BWR

8) One major issue with the initial designs of RBMK reactors was 1 point

- high fuel enrichment requirement
 inability of replenishing fuel during operation
 positive void reactivity coefficient
 the requirement of specialized cladding material

No, the answer is incorrect. Score: 0

Accepted Answers: positive void reactivity coefficient

9) The high-temperature pebble-bed reactor is an improved version of 1 point

- PHWR
 AGR
 BWR
 PWR

No, the answer is incorrect. Score: 0

Accepted Answers: AGR

10) The biggest advantage of using heavy water as the moderator in PHWRs is 1 point

- lower cost of moderator
 higher fuel burn-up
 use of natural uranium
 all of the above

No, the answer is incorrect. Score: 0

Accepted Answers: use of natural uranium

11) Among the followings, which one is a Gen-IV design? 1 point

- SFR
 ABWR
 CPR-1000
 ESBWR

No, the answer is incorrect. Score: 0

Accepted Answers: SFR

12) AHWR concept proposed by BARC, India employs 1 point

- heavy water as both moderator & coolant
 heavy water as moderator & ordinary water as coolant
 ordinary water as moderator & heavy water as coolant
 ordinary water as both moderator & coolant

No, the answer is incorrect. Score: 0

Accepted Answers: heavy water as moderator & ordinary water as coolant

13) Most of the Gen-IV designs propose to employ residual heat to achieve thermochemical cracking of water for the production of _____ gas.

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: String) hydrogen

14) The working pressure in SCWR must be above the _____ pressure of water. 1 point

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: String) critical

15) The VTR reactor concept can attain very high temperature (~ 1000 °C). To suit such temperature ranges, it uses helium as the coolant and _____ as the moderator. 1 point

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: String) graphite