Course SH2702 Exam Quiz Part

NOTE: Each question has three answer options, from which 0 to 3 can be correct. Mark with X the options that you consider as correct ones. One point (1p.) will be assigned for the answer only if all three options are correctly marked/unmarked; otherwise zero points (0p.) will be given.

Q1	**Family Name, First Name:**	**Personal number (yymmdd-xxxx):**	
NR	**Question**	**Answer options (0 to 3 answers correct)**	**Mark X correct**
1	Currently the total number of power reactors in the world is about	350	
		450	X
		550	
2	The reason why containments are used is, between others,	To provide a fire-protecting atmosphere	
		To provide a support for safety equipment	
		To protect the public from radioactive release	
3	The following reactors belong to the Generation IV family:	MSR	
		SFR	
		AGR	
4	According to the criteria given by IAEA, Small Modular Reactors are such reactors that, between others,	Have the electrical power less than 150 MWe	
		Have any power and a modular construction	
		Have any power and are very safe	
5	Reactor Coolant System is designed to	supply steam to turbines	
		remove heat from the reactor core during normal operation	
		Remove any impurities from the reactor	
6	Reactor coolant system of EPR contains	Four loops and eight reactor coolant pumps	
		Four loops and four reactor coolant pumps	
		Four loops and two reactor coolant pumps	
7	Steam generator can provide superheated steam only when	It is of U-tube type	
		It is of once-through type	
		It can never generate superheated steam	
8	Pressurizer is connected to the hot leg of the reactor coolant system through	Relief valves	
		A pressurizer relief tank	
		A surge line	
9	When the pressure in the PWR's reactor coolant system must be decreased	A pressure relief valves are open by the operator	
		Cold water is sprayed in the pressurizer by spray nozzles	
		The reactor power is decreased	
10	For reactivity control in BWRs, the following means are used:	Burnable neutron absorbers mixed with fuel	
		Soluble absorbers dissolved in the moderator	
		Control rods inserted into the core	

Please answer the questions below by giving the values in the provided fields and using the specified units. **IMPORTANT! For each question, use additional sheets to motivate your answers. No points will be given if the answers are not correctly motivated! Please label the sheets with the corresponding question number.**

Q4: A typical PWR plant is in normal steady-state operation as shown in Fig. 1. The reactor has a thermal power of **3460 MW**, and the coolant mass flow rate is **16000 kg/s**, with system reference pressure of **15.5 MPa**. The core inlet temperature is **295℃**. The primary loop pump provides a pressure head of **0.35 MPa** during normal operation. The secondary side of the steam generator operates under pressure of **7.2 MPa**. The steam leaves the steam generator with a carryover fraction of **0.005** and total mass flow rate of **1850 kg/s**.	Answer	
	Value	Unit
a) Calculate the core outlet temperature. (2 p.)		

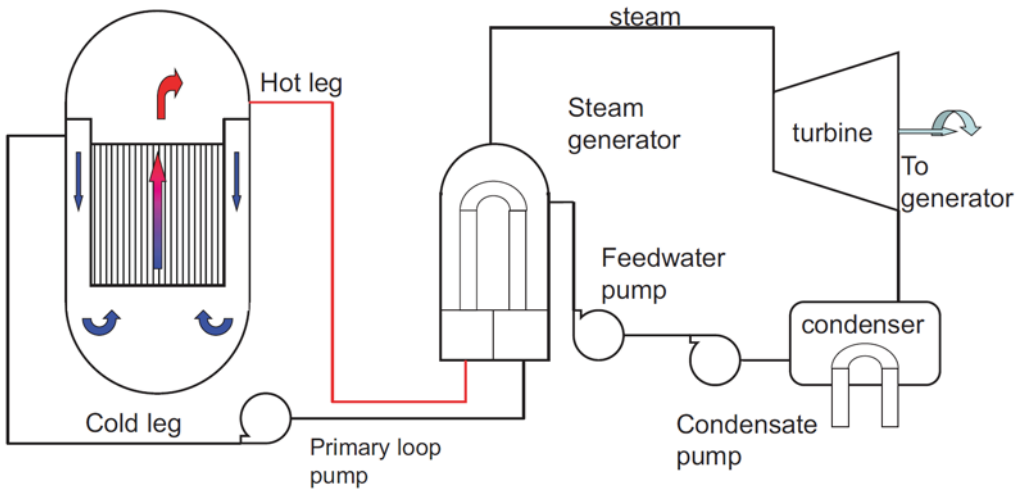

Fig. 1 A typical PWR plant