Ref No.:- Ex/PG/NuE/T/127A/2018

Master of Nuclear Engineering 2nd Semester Examination, 2018

Subject: Reactor Physics and Engineering II

Time: Three hours **Full marks: 100**

Answer any Five Questions

1.	a. Define Radioactivity.	2
	b. Write a short note on Internal Conversion.	3
	c. Write a short note on Auger Electrons.	5
	d. Write a short note on Spontaneous Fission.	5
	e. Write a short note on Annihilation Radiation.	5
2.	a. Write the difference between Nuclear Power Plant and Thermal Power Plant.	2
	b. Write the difference between Reliability and Quality.	2
	c. Define Maintainability.	2
	d. Define Availability.	2
	e. Write a short note on Photo electric absorption.	6
	f. Write a short note on Pair Production.	6
3.	a. Describe TMI accident.	8
	b. Describe Chernobyl accident.	8
	c. What are the Severe Accident Management Guidelines?	4
4.	a. What are the safety barriers in a nuclear power plant?	2
	b. Write the major engineered safety features.	3
	c. What are the different levels of defense in depth system?	5
	d. What are the reasons for which reactor trip signal is activated?	6
	e. What are the criteria for determination of design basis LOCA in PWR or BWR?	4

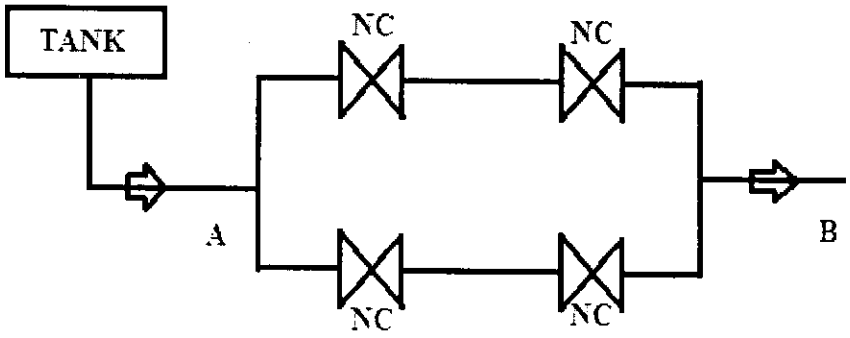
5. a. Describe the functions of containment 5

b. What are the calculated ECCS acceptance criteria? 5

c. Draw the Event Tree and also find its consequence. 5

Large Loss of Coolant	Reactor Protection	High Pressure Injection System	Low Pressure Injection System	GDWP Recirculation Failure	Unavailability of Moderator Cooling

d. Draw the fault tree. 5



6. a. Write the goals of reactor safety 4

b. Consider a typical 1000-MW(el) PWR which discharges fuel assemblies with an average discharge burnup of 33000 MW.d/t. If the thermodynamic efficiency is 32 percent, and each assembly contains 450 kg of total uranium, how many assemblies would be discharged annually? A plant factor of 0.7 may be assumed. 4

c. Define passive system and classify it. 5

d. Define capacity factor and plant factor. 2

e. Write a short note on spent-fuel management 5