



Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code : X60829**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020  
Seventh Semester  
Mechanical Engineering  
ME2034 – NUCLEAR ENGINEERING  
(Regulations 2008)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Define mean life and decay constant.
2. Define Transmutation.
3. How much power is generated by the fissioning of 1 g of  $U^{235}$  per day?
4. List the different types of nuclear reactor designs.
5. Define mixed oxide or MOX fuel.
6. Define the term distribution coefficient.
7. Classify the different types of coolant with example.
8. State the disadvantages of sodium fast reactor.
9. Write short notes on radiation hazards.
10. What do you mean by weapons proliferation ?

PART – B

(5×16=80 Marks)

11. a) i) Discuss the detailed procedure of Half-life measurement. (8)  
ii) Write notes on Elastic scattering and inelastic scattering. (8)
- (OR)
- b) i) Explain the Transmission method for determining the cross section. (8)  
ii) Write notes on types of scattering cross section. (8)



12. a) Describe atomic mobile reactors and explain the function of submarine thermal atomic reactors, submarine atomic intermediate reactors with sketch. **(16)**
- (OR)
- b) Explain the following irradiation effects of thorium
- i) With Metal and its alloys. **(8)**
- ii) With Mixed ceramic compounds. **(8)**
13. a) Explain (i) FLUOREX process with diagram and (ii) spent fuel processing. **(8+8)**
- (OR)
- b) Explain the working principle with a diagram of solvent and extraction equipment used in nuclear industry. **(16)**
14. a) Explain with a neat sketch the boiling water reactor power plant. **(16)**
- (OR)
- b) Explain the construction and working of super critical water reactor. **(16)**
15. a) Explain how the solid nuclear waste materials are disposed. **(16)**
- (OR)
- b) i) List the types of nuclear wastes. **(8)**
- ii) Explain the safety aspects of nuclear reactor. **(8)**
-