

**B.Tech. – VIEP – MECHANICAL ENGINEERING  
(BTMEVI)**

**Term-End Examination**

00593

**June, 2018**

**BIMEE-017 : NUCLEAR POWER ENGINEERING**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any **five** questions. All questions carry equal marks.*

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1. (a) What is meant by nuclear fission ? Discuss the conditions necessary for nuclear fission. 7
- (b) What do you understand by moderation ? Why is it essential ? 7
2. (a) Draw a neat diagram and describe the working of a Pressurised Water Reactor (PWR) plant. 7
- (b) Explain the layout of a nuclear power plant for power generation. 7

3. (a) Explain two nuclear reactions with a neat sketch. 7
- (b) Explain CANDU type reactor with its merits and demerits. 7
4. (a) Explain clearly the difference between 'fast neutrons' and 'thermal neutrons'. Explain clearly why thermal neutrons can cause fission of  ${}_{92}\text{U}^{235}$  but not of  ${}_{92}\text{U}^{238}$ . 7
- (b) Why is shielding of a reactor necessary? What do you understand by thermal shielding? 7
5. (a) Explain how control rods control the reactor. What are the materials generally used to make control rods? 7
- (b) Discuss the functions and materials for the following: 7
- (i) Reflector
- (ii) Biological field
6. (a) What factors must be considered while selecting the materials for the various reactor components? 7
- (b) What do you mean by "economics of nuclear plants"? Explain in brief. 7

7. Write short notes on any *four* of the following :

$$4 \times 3 \frac{1}{2} = 14$$

- (a) Radioactive Decay
  - (b) Electromagnetic Pins
  - (c) Shielding of Nuclear Reactor
  - (d) Ash Handling System
  - (e) Gas Cooled Reactors
  - (f) Disposal of Radioactive Wastes
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