

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

00013

**Term-End Examination**

**December, 2016**

**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. Use of scientific calculator is permitted.*

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1. (a) What are the different types of nuclear reactors ? Explain the significance of each in nuclear power generation. 7
- (b) What do you understand by moderation ? Why is it essential ? 7
  
2. (a) Explain clearly how thermal reactors can cause fission of  ${}_{92}\text{U}^{235}$  but not of  ${}_{92}\text{U}^{238}$ . 7
- (b) What do you understand by fertile material and breeding ? What is the importance of breeding in power engineering ? 7

3. (a) Draw a neat diagram of Pressurised Water Reactor (PWR) and give its advantages and disadvantages. 7
- (b) What are the outstanding features of advanced gas cooled reactor over other types ? When are these preferred ? 7
4. (a) What do you understand by control of a reactor ? What different controls are necessary in a thermal power reactor ? 7
- (b) What are the types of nuclear radiation and their major effects on human and plant life ? 7
5. (a) What are the desirable properties of a control rod material ? Compare the merits and demerits of boron and cadmium as control rod materials. 7
- (b) Discuss with the help of a diagram, the methods used for treating the medium and high radioactive wastes. 7
6. (a) What factors must be considered while selecting the materials for the various reactor plants ? 7
- (b) Discuss the safety measures for nuclear power plants. 7

7. Write short notes on the following :

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

- (a) Biological Shield
  - (b) Particle Acceleration
  - (c) Radiation Detectors
  - (d) Nuclear Power Economics
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