

# CBCS Scheme

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15EE551

## Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018 Introduction to Nuclear Power

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Define energy. What are different forms of energy? Explain. (08 Marks)  
b. With a neat diagram, explain basic components of a nuclear reactor. (08 Marks)

OR

- 2 a. Draw the energy flow diagram for the earth. (06 Marks)  
b. Explain working of fast reactors. (06 Marks)  
c. Explain the fission process. (04 Marks)

### Module-2

- 3 a. What are the general features of reactor coolant? Explain. (08 Marks)  
b. Describe the operational states that can occur during normal operation of a reactor. (08 Marks)

OR

- 4 a. List the advantages and disadvantages of boiling coolants. (05 Marks)  
b. Describe various operating states for sodium cooled fast reactor. (06 Marks)  
c. List the problems associated with using light water as a coolant. (05 Marks)

### Module-3

- 5 a. Discuss the Browns Ferry fire accident. What are the lessons learnt from this accident? (08 Marks)  
b. What are the design short coming of Chernobyl reactor explain (08 Marks)

OR

- 6 a. Explain NRx incident. What is the lesson learnt from this incident? (08 Marks)  
b. List the safety measures taken to improve the safety characteristics of RBMK reactor at Chernobyl. (04 Marks)  
c. Discuss the International Atomic Energy Agency Scale for events at nuclear installation. (04 Marks)

### Module-4

- 7 a. Discuss the valuable materials that can be present in the fuel removed from the plant. (06 Marks)  
b. Explain the reasons for failure of reactor pressure vessel. (07 Marks)  
c. What is china syndrome? (03 Marks)

OR

- 8 a. Discuss progressive failure of fuel. (06 Marks)  
b. Differentiate between on load refueling and off load refueling. (04 Marks)  
c. Discuss reprocessing of spent fuel. (06 Marks)

**Module-5**

- 9 a. List the fission products and discuss their biological significance. (08 Marks)  
b. Explain the fusion process. (08 Marks)

OR

- 10 a. Explain the options for management of high level active wastes. (08 Marks)  
b. What is confinement of plasma? What are the methods to provide confinement? (08 Marks)

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