Reg. No.

Question Paper Code : **51835**

B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Seventh Semester

Mechanical Engineering

ME 2034/ME 708/ME 1004/10122 MEE 33 – NUCLEAR ENGINEERING

(Common to Mechanical and Automation Engineering)

(Regulations 2008/2010)

(Common to PTME 2034 – Nuclear Engineering for B.E. (Part-Time)
Sixth Semester – Mechanical Engineering – Regulations 2009)

Time : Three Hours   **Maximum : 100 Marks**

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1.   Define Radioactivity.

2.   What is binding energy ?

3.   Define nuclear fuel cycle.

4.   Write the applications of Zirconium.

5.   Define the term reprocessing.

6.   Name the different stages of reprocessing of spent fuel.

7.   Define the term fast breeding.

8.   Write the uses of rector shielding.

9.   List the various safety systems used in nuclear power plant.

10.   Write short note on safety criteria.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Explain the different nuclear models of an atom. (16)

OR

(b) Describe different types of non-elastic interactions of neutron.

12. (a) (i) List the names of common Berylium fuels and explain their properties. (10)

(ii) Explain chain reaction with neat sketch. (6)

OR

(b) Describe the production and purification of zirconium.

13. (a) Describe the various stages of reprocessing of irradiated fuel.

OR

(b) (i) With a neat sketch, explain the working of solvent extraction equipment. (10)

(ii) Write the characteristics of the spent fuel. (6)

14. (a) Describe the design construction and operation of a fast breeder reactor.

OR

(b) (i) Discuss the desirable properties of a good shielding material and their significance. (8)

(ii) Explain the working of fusion reactor, with an illustration. (8)

15. (a) Explain different types of wastes coming out at different stages of nuclear fuel cycle and their disposal.

OR

(b) Discuss the radiation hazards and their prevention.

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