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Roll No .....

**MEEM - 104****M.E./M.Tech., I Semester**

Examination, December 2015

**Hydro Power And Nuclear Power Generation***Time : Three Hours**Maximum Marks : 70*

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

ii) Draw neat diagrams wherever required.

1. a) Discuss hydro turbine selection criteria for hydro power plant.  
b) Briefly discuss function of each component in hydro power plant with suitable sketch of overall plant.
2. Write briefly about following (Any Two)
  - a) Balancing reservoirs
  - b) Types of penstocks
  - c) Flow and power duration curve
  - d) Storage capacity of hydro power plant
3. a) What are micro-hydel power plants? Draw component layout.  
b) Write a short note on Hydro-power in India.
4. a) Discuss the following terms related to nuclear power plant:
  - i) Radioactivity
  - ii) Binding energy
  - iii) Energy-mass equivalence
  - iv) Irradiation of medical products
 b) Discuss the types of nuclear reactions.

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5. Write short answers of the following: (Any Three)
  - a) How do you protect yourself from radiation leaks?
  - b) Is it possible to prevent disease after one has been exposed to radiation?
  - c) What differences are observed in health effects between short-term and long-term exposures to radiation, when total exposure doses are the same?
  - d) Are experiments using animals, such as mice, being conducted to study the degree of effects of radiation exposure?
6. Write short technical answers of the following: (Any Three)
  - a) How much energy is released in the fission of a single U-235 atom? Describe the process by which this uranium isotope undergoes induced fission.
  - b) U-235 must be enriched to work. What percentage is needed for U-235 to be used in:
    - i) Nuclear power plants?
    - ii) Weapons?
  - c) What is the purpose of the control rods? What is a moderator?
  - d) Discuss the safety issues associated with a thermal meltdown and mining of uranium.
7. a) Discuss general components of a nuclear reactor with neat diagram.  
b) State the classification of nuclear reactors.
8. Write short notes on the following: (Any Two)
  - a) India's 3-stage program for nuclear power development
  - b) CANDU (Canadian Deuterium Uranium) type reactor
  - c) Nuclear safety regulations and standards

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