

Roll No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: : MTech / Nuclear Science and Technology
Subject (Course): Nuclear Waste Storage and Management
Course Code: NSAT 8001
No. of page/s: 2

Semester – III
Max. Marks : 100
Duration : 3 Hrs

Section- A

Answer all five questions, each question carries 4 marks

1. What is the difference between open and closed nuclear fuel cycle?
2. How nuclear wastes are generated during nuclear reactor operation?
3. What is the basis for nuclear waste classification?
4. What are the methods of spent fuel management?
5. What are the major characteristics of host rock of geological repository?

Section- B

Answer all four questions, each question carries 10 marks

6. Define activation products, fission products and major and minor actinides
7. Explain the solid, liquid and gaseous category of waste generated from the reprocessing process

Or

Give details of measures of waste magnitudes of a nuclear reactor

8. Describe the vitrification method of non-recyclable materials of nuclear waste
9. Describe in detail the multiple barrier system in deep geological repository

Section- C

Answer both the questions, each question carries 20 marks

10. Write in detail how the low level nuclear waste is segregated, conditioned and disposed

Or

Describe in detail the different types of waste generated during the nuclear fuel cycle

11. Describe the process of actinide management by transmutation

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Section- A

Answer all five questions, each question carries 4 marks

1. List the Major steps of nuclear fuel cycle
2. What are the basic objectives to be followed in disposal of radioactive wastes?
3. What are the different options for the disposal of high-level radwaste?
4. Name few typical ground radioactive disposal facilities
5. Why is there a controversy over the selection of a high-level nuclear waste disposal site?

Section- B

Answer all four questions, each question carries 10 marks

6. Describe in detail the radionuclides present in spent fuel of nuclear reactor
7. Write in detail the mass and volume per GW Yr of radwastes of commercial reactors BWR and PWR

or

Give details of half -life and activity of radionuclides in spent fuel versus time since discharge of fuel from reactor

8. Write the flow chart of reprocessing of spent fuel
9. Write in detail the isotopic composition of reprocessed fuel

Section- C

Answer both the questions, each question carries 20 marks

10. Write in detail how the high level nuclear waste is segregated, conditioned and disposed

Or

Describe the reprocessing technique PUREX

11. Explain in detail geological disposal concept and components of geological repository
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