EINSTEIN'S ACADEMY

10^{TH} SCIENCE

UNIT-6

MARKS - 50

I Choose the correct answer

10 x 1 = 10

1. Kamini reactor is located at_____

a) Kalpakkam b) Koodankulam

c) Mumbai d) Rajasthan

2. In which of the following, no change in mass number of the daughter nuclei takes place

i) α decay ii) β decay

iii) γ decay iv) neutron decay

a. (i) is correct

b (ii) and iii) are correct

c (i) & (iv) are correct

d (ii) & (iv) are correct

3. In the nuclear reaction ${}_6X^{12}$ α decay, ${}_ZY^A$, the value of A & Z.

a)8,6 b) 8,4 c) 4,81

a) cannot be determined with the given data

4. Which of the following is/are correct?

i. Chain reaction takes place in a nuclear reactor and an atomic bomb.

ii. The chain reaction in a nuclear reactor is controlled

iii. The chain reaction in a nuclear reactor is not controlled

iv. No chain reaction takes place in an atom bomb

a. (i) only correct b. (i) & (ii) are correct

c.(iv) only correct d. (iii) & (v) are correct

4. Man-made radioactivity is also known as

a) Induced radioactivity b) Spontaneous radioactivity

c) Artificial radioactivity d) a & b

5. Unit of radioactivity is

a) roentgen b) curie

c) becquerel d) all the above

6. Artificial radioactivity was discovered by

a) Becquerel b) Irene Curie

c) Roentgen d) Neil's Bohr

7._____isotope is used for the treatment of cancer.

a) Radio Iodine

b) Radio Cobalt

c) Radio Carbon

d) Radio Nickel

8. Gamma radiations are dangerous because

a) it affects eyes & bones b) it produces genetic disorder

c) it affects tissues d) it produces enormous amount of heat

9._____aprons are used to protect us from gamma radiations

a) Lead oxide b) Iron

c) Lead d) Aluminium

10. Proton - Proton chain reactions is an example of.

a) Nuclear fission b) α decay

c) Nuclear fusion d) β decay

II. Fill in the blanks

1 x 2 = 2

11. Abbreviation of ICRP_____

12. ${}_{z}Y^{A} \rightarrow {}_{z+1}Y^{A} + X$; Then, X is_____

III State whether the following statements are true or false: If false, correct the statement

2x1 =2

13. Plutonium - 239 is a fissionable material.

14. Einstein's theory of mass energy equivalence is used in nuclear fission and fusion.

IV. Match the following

(4)

a. Soddy Fajan - Natural radioactivity

b. Irene Curie - Displacement law

c. Henry Bequerel- Mass energy equivalence

d. Albert Einstein- Artificial Radioactivity

V. Arrange the following in the correct sequence:

1x1=1

15. Arrange the following in the chronological order of discovery

Nuclear reactor, radioactivity, artificial radioactivity, discovery of radium.

VII. Answer the following questions in few sentences. (answer any Five)

8x 2=16

16. A cobalt specimen emits induced radiation of 75.6 millicurie per second. Convert this disintegration in to becquerel (one curie = 3.7×10^{10} Bq)

17. Which radioactive material is present in the ore of pitchblende?

18. If A is a radioactive element which emits an a - particle and produces , $_{104}Rf^{259}$). Write the atomic number and mass number of the element A.

19. Which hazardous radiation is the cause for the genetic disease?

20. Write any three features of natural and artificial radioactivity.

21. In Japan, some of the new born children are having congenital diseases. Why?

22. Mr. Ramu is working as an X - ray technician in a hospital. But, he does not wear the lead aprons. What suggestion will you give to Mr. Ramu?

23. Define critical mass.

24. State Soddy and Fajan's displacement law.

25. In Japan, some of the new born children are having a congenital disease. Why?

VIII. Answer the following questions in detail.(answer any 3)

3x5=15

26. Explain the process of controlled and uncontrolled chain reactions.

27. Compare the properties of alpha, beta and gamma radiations.

28. Calculate the amount of energy released when a radioactive substance undergoes fusion and results in a mass defect of 2 kg.

29. What is a nuclear reactor? Explain its essential parts with their functions.