

**C. ABDUL HAKEEM COLLEGE (AUTONOMOUS),
MELVISHARAM - 632 509.
SEMESTER EXAMINATIONS, APRIL - 2018**

B.Sc., PHYSICS

SEMESTER VI

**U15MPH601 / U14MPH601 - NUCLEAR PHYSICS AND RADIATION
PHYSICS**

Time: Three Hours

Maximum: 75 Marks

SECTION - A (10 X 2 = 20 Marks)

Answer ALL Questions.

1. Explain nuclear binding energy.
2. What are the magic numbers in shell model?
3. Write the Gamow's theory of α decay.
4. What are the characteristics of β ray spectrum?
5. What is linear accelerator?
6. Define the efficiency of GM counter.
7. Define nuclear fission.
8. Explain reactor shielding.
9. What are strange particles?
10. Explain lepton number.

SECTION - B (5 X 5 = 25 Marks)

Answer ALL Questions.

11. a) Write notes on nuclear forces.

(Or)

- b) Explain spin orbit interaction.

12. a) Write notes on neutrino theory of β decay.

(Or)

- b) Derive an expression for radioactive disintegration constant.

13. a) Explain the working of bubble chamber.

(Or)

- b) Discuss the working of Ionization chamber.

14. a) Explain classification of nuclear reactor.

(Or)

- b) Write notes on Radiation hazards.

15. a) Discuss about the types of elementary particles interactions.

(Or)

- b) Explain particle and antiparticles with examples.

SECTION - C (3 X 10 = 30 Marks)

Answer ANY THREE Questions.

16. Derive an expression for Weizsaecker's semi empirical mass formula.
17. Explain transient and secular equilibrium of radio activity.
18. Describe a Cyclotron. Derive an expression for the frequency and energy of a particle accelerated by it.
19. Explain what is meant by nuclear fusion and proton-proton cycle.
20. Explain Time reversal, charge conjugation, parity and their invariance theorem.
