

PART 1 - PHYSICS

Topic : Nuclei

SECTION-A : (Maximum Marks : 4)

This section contains **ONE** question.

Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.

For each question, choose the option corresponding to the correct answer.

Answer to each question will be evaluated according to the following marking scheme :

Full Marks : +4 If **ONLY** the correct option is chosen;

Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered);

Negative Marks : -1 In all other cases.

1. A nuclear reactor starts producing a radioactive nuclide X from $t = 0$, at a constant rate of α per second. Each decay of X produces energy E_0 , which is utilized to heat a liquid of mass m and specific heat s . Assuming no heat loss from the liquid and taking λ as the decay constant of X, the rate of increase in the temperature of the liquid is:

[JEE Advanced 2026 Paper 2]

- (A) $\frac{\alpha E_0}{m s}(1 - e^{-\lambda t})$ (B) $\frac{\alpha E_0}{m s}(e^{\lambda t} - 1)$ (C) $\frac{\lambda E_0}{m s}(1 - e^{-\lambda t})$ (D) $\frac{E_0}{m s}(\alpha - \lambda e^{-\lambda t})$

Scan or tap for the full solution



Space for Rough Work

JEE ADVANCED NUCLEI — RADIOACTIVITY: LAW OF RADIOACTIVE DECAY, HALF-LIFE AND MEAN LIFE — PYQS

Test Pattern : JEE (Advanced)

ANSWER KEY

SECTION-A

[illegible]