

PART 1 - PHYSICS

Topic : Nuclei

SECTION-1 : (Maximum Marks : 3)

- 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 : +3 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

Test Pattern : **JEE (Advanced)**

SECTION-1

[illegible]