TOPIC
Mathematics – Section I – Question 22

QUESTION
Given D is the differential operator, the general solution to
$$(D+2)(D-3)y = 0$$
is

(A) $y = K_1 e^{-2x} + K_2 e^{-3x}$
(B) $y = K_1 e^{-2x} + K_2 e^{3x}$
(C) $y = K_1 e^{2x} + K_2 e^{3x}$
(D) $y = K_1 e^{2x} + K_2 e^{-3x}$

HINT
The characteristic equation of the ordinary differential equation is
$$(m+2)(m-3) = 0$$

SOLUTION
The characteristic equation of the ordinary differential equation is
$$(m+2)(m-3) = 0$$
the roots of which are
$$m_1 = -2, m_2 = 3$$
The solution then is
$$y_H = K_1 e^{m_1 x} + K_2 e^{m_2 x}$$
$$= K_1 e^{-2x} + K_2 e^{3x}$$

ANSWER
(B)

CONTRIBUTOR
Autar Kaw