SOLUTIONS OF JEE ADVANCED 2016 PAPER 2 CODE 4 SAME DAY WITH IN 2 HOURS

42 (A)

$$I = \int_{-\pi/2}^{\pi/2} \frac{x^2 \cos x}{1+e^x} dx \quad -(1)$$

$$I = \int_{-\pi/2}^{\pi/2} \frac{(-x)^2 \cos(-x)}{1+e^{-x}} dx \rightarrow \int_{-\pi/2}^{\pi/2} \frac{x^2 \cos x e^x}{e^x+1} \quad -(2)$$

adding (1) & (2)

$$2I = \int_{-\pi/2}^{\pi/2} \frac{x^2 \cos x (e^x+1)}{(e^x+1)} dx$$

$$2I = \int_{-\pi/2}^{\pi/2} x^2 \cos x \rightarrow 2I = 2\int_0^{\pi/2} x^2 \cos x dx$$

$$I = \int_0^{\pi/2} x^2 \cos x dx.$$

$$I = (\sin x\, x^2)_0^{\pi/2} - \int_0^{\pi/2} \sin x\, 2x\, dx.$$

$$= \frac{\pi^2}{4} - \left[(-\cos x)(2x)_0^{\pi/2} - \int_0^{\pi/2} -\cos 2x (2) \right].$$

$$= \frac{\pi^2}{4} - 2 \text{ so option (A)}.$$

Index

Que	Page
37	7
38	7
39	6
40	5
41	10
42	1
43	11
44	4
45	9
46	9
47	8
48	8
49	4
50	10
51	3
52	3
53	2
54	2