25th February, 2021
Shift-2

EE24BTECH11063 - Y.Harsha Vardhan Reddy

Single correct

1) Let A be a 3×3 matrix with $\det(A) = 4$. Let R_i denote the i^{th} row of A. If a matrix B is obtained by performing the operation $R_2 \to 2R_2 + 5R_3$ on 2A, then $\det(B)$ is equal to:

a) 64 b) 16 c) 80 d) 128

2) The shortest distance between the line $x - y = 1$ and the curve $x^2 = 2y$ is :

a) $\frac{1}{2}$ b) 0 c) $\frac{1}{2\sqrt{2}}$ d) $\frac{1}{\sqrt{2}}$

3) Let A be a set of all 4-digit natural numbers whose exactly one digit is 7. Then the probability that a randomly chosen element of A leaves remainder 2 when divided by 5 is:

a) $\frac{1}{5}$ b) $\frac{2}{9}$ c) $\frac{97}{297}$ d) $\frac{122}{297}$

4) $\operatorname{cosec}\left[2\cot^{-1}(5) + \cos^{-1}\left(\frac{4}{5}\right)\right]$ is equal to:

a) $\frac{75}{56}$ b) $\frac{65}{56}$ c) $\frac{56}{33}$ d) $\frac{65}{33}$

5) If $0 < x, y < \pi$ and $\cos x + \cos y - \cos(x + y) = \frac{3}{2}$, then $\sin x + \cos y$ is equal to:

a) $\frac{(1+\sqrt{3})}{2}$ b) $\frac{(1-\sqrt{3})}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{1}{2}$