VITMEE Previous Year Question Papers 2015

1. The line passing through the points A(1, -2, -3) and B(4, -5, -6) intersects the plane z = 1 at the point
   A) (7/3, -10/3, 1)
   B) (-7/3, -10/3, 1)
   C) (-3, 2, 1)
   D) (-3, 6, 1)
2. A box contains 8 items of which 2 are defective. A person draws 3 items from the box. Determine the expected number of defective items.
   A) 0.75
   B) 0.3
   C) 0.2
   D) 0.1
3. If a = cos α + i sin α, b = cos β + i sin β, c = cos γ + i sin γ and a + b + c = 0, the value of a^{-1} + b^{-1} + c^{-1} is
   A) 1
   B) 0
   C) -1
   D) 2
4. The value of λ for which the system of equations x+y-2z=0, 2x-3y+z=0. x-5y+4z=λ is consistent is
   A) 1
   B) -1
   C) 0
   D) 2
5. Suppose $\vec{a}$ and $\vec{b}$ are vectors such that $\vec{a} \times \vec{b} = 2\hat{i} + \hat{j} - \hat{k}$ and $\vec{a} + \vec{b} = \hat{i} - \hat{j} + \hat{k}$. The least value of $|\vec{a}|$ is
   A) 1/√2
   B) 2
   C) √2
   D) √2 - 1
6. A general solution to y" - √5 y = 0 is
   A) $y = c_1 e^{\sqrt{5}\, t} + c_2 t$
   B) $y = c_1 \cos \sqrt{5}\, t + c_2 \sin \sqrt{5}\, t$
   C) $y = c_1 e^{\sqrt{5}\, t} + c_2 t\, e^{\sqrt{5}\, t}$
   D) $y = c_1 e^{\sqrt{5}\, t} + c_2 e^{-\sqrt{5}\, t}$
7. In a binary communication channel, the probability that a transmitted zero is received as zero is 0.95 and the probability that a transmitted one is received as one is 0.90. If the probability that a zero is transmitted is 0.4, then the probability that a one was transmitted, given that a one was received is
   A) 17/28
   B) 27/37

C) 29/37
D) 27/28

8. If ($\vec{a}$, $\vec{b}$, $\vec{c}$) are three vectors such that if $\vec{a} \times \vec{b} = \vec{c}$ and $\vec{b} \times \vec{c} = \vec{a}$, then
A) If $\vec{a}$, $\vec{b}$ and $\vec{c}$ are pair-wise perpendicular
B) $|\vec{a}| = |\vec{b}| = |\vec{c}| = 1$
C) $|\vec{a}| = |\vec{b}| = |\vec{c}| \neq 1$
D) $|\vec{a}| \neq |\vec{b}| \neq |\vec{c}|$
9. If [x] denotes the greatest integer ≤ x, then the value of the integral $\int_4^{10}$ $[x^2]\,dx / ([x^2 - 28x + 196] + [x]^2)$ is
A) 0
B) 1
C) 3
D) 4
10. The proposition $p \wedge (P \vee q)$ is
A) a tautology
B) a contradiction
C) logically equivalent to $p \wedge q$
D) logically equivalent to $p \vee q$