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MATHEMATICS · JEE MAIN

Probability

Previous Year Questions with answers

245 questions · **191** papers · **2002–2026** · newest paper first

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What is in this PDF: every Probability question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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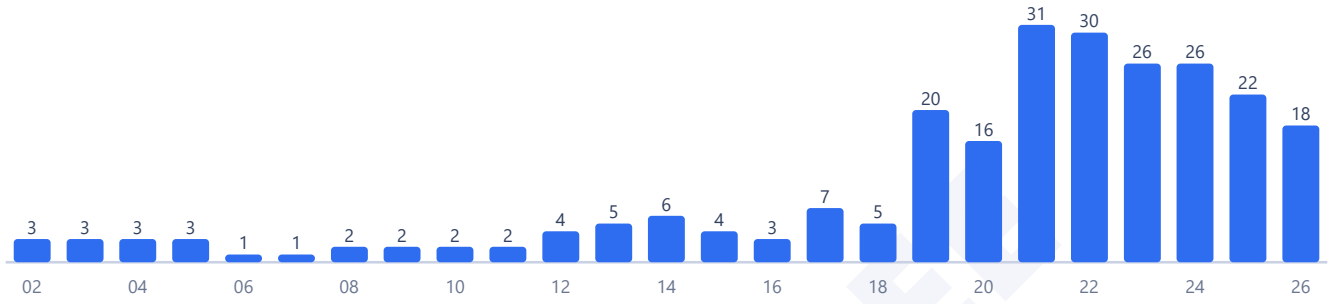
Chapter at a glance

4.1%	245	154 of 162	211 / 34
of Mathematics questions, 2019–2026	questions, 2002–2026	papers asked it, 2019–2026	MCQ / numerical, 2002–2026

Trend. Steady: 1.1 questions per paper in 2024–2026 against 1.2 in 2019–2023.

Questions per year



Counts are the questions we hold: 245 in 191 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2002–2026)

Basic Probability	**89**
Random Variables & Distributions	**84**
Conditional Probability	**72**

How often it comes up

Probability requires logical modelling and combinatorial counting under Unit 13: Statistics and Probability in the Class 12 curriculum, securing rank 11 among the 29 chapters in the subject. Across the 162 papers conducted between 2019 and 2026, this chapter supplied 189 questions, accounting for 4.1 percent of all mathematics questions. It appeared in 154 of those 162 papers and has been tested every single year since 2019. Over the recent 2024 to 2026 examination cycles, it contributed 66 questions across 58 papers, averaging 1.1 questions per paper with a 4.3 percent subject share. Comparing the earlier 2002 to 2018 share of 4.3 percent against 2024 to 2026 shows that its long-term share is about the same, while comparing 2019 to 2026 with 2024 to 2026 also shows it is about the same. Across the complete historical record from 2002 to 2026 spanning 200 papers, 245 questions were asked in 191 papers, including 34 numerical answer questions between 2019 and 2026.

In the 2024, 2025, and 2026 examination periods, the question tallies were 26, 22, and 18 questions respectively.

Probability problems frequently serve as the ultimate test of combinatorial enumeration. Because modern questions integrate conditional updating and discrete random variable distributions, methodical case listing and probability tree analysis are essential.

Most-asked topics

Questions in this chapter organize across three primary subtopics:

1. **Random Variables & Distributions (68 questions, 2019-2026; 84 total, last asked 2026)** The most frequent subtopic in recent testing. Covers discrete probability distributions, calculating the mean expectation and variance, probability mass functions defined in terms of an unknown parameter k, and binomial distributions involving repeated independent trials. Note that Bernoulli trials and binomial distributions were formally removed from the updated syllabus, yet general discrete random variables remain active.

2. **Basic Probability (67 questions, 2019-2026; 89 total, last asked 2026)** Involves classical probability definitions using permutations and combinations, dice and card problems, divisibility conditions on randomly chosen integer subsets, geometry-based geometric probability, and mutually exclusive events.

3. **Conditional Probability (54 questions, 2019-2026; 72 total, last asked 2026)** Covers conditional probability definitions, the multiplication rule for independent events, the theorem of total probability, and Bayes' theorem. Recurring formats include drawing items sequentially from two or more urns with transfer steps between them.

What the questions look like

Examiners repeatedly use well-defined probabilistic architectures:

- **Urn Transfer and Bayes' Inversion**: A ball of unknown color is transferred from bag B to bag A, followed by drawing a ball from bag A. Problems ask for the total probability of drawing a specific color or the reverse conditional probability that the transferred ball was white.
- **Discrete Distribution with Parameter Constraints**: A discrete random variable X takes small non-negative integer values with probabilities proportional to powers of k. Normalising the total probability to unity fixes k, after which the mean or variance is evaluated.
- **Divisibility Constraints on Subset Products**: Selecting two or three distinct numbers from an initial integer sequence, followed by finding the probability that their product or sum satisfies divisibility requirements.
- **Independent Experiment Stopping Rules**: A game where two players toss dice alternately until a specific sum appears, asking for the probability that a particular participant wins.

How to practise it

Accurate probability calculation balances systematic counting with conditional discipline:

- **Normalise probability distributions first**: In any discrete distribution problem, immediately sum all probability entries and set the total equal to unity. This determines unknown scalars like k before embarking on expectation or variance computations.
- **Map out two-stage experiments with probability trees**: For problems involving sequential draws or transfers between urns, draw a clear tree diagram showing intermediate transfer branches. Multiply probabilities along each path and sum over mutually exclusive branches.
- **Use complementary probability for at least one scenarios**: When computing the probability that an event occurs at least once across several independent trials, compute one minus the probability that the event never occurs.
- **Check independence criteria strictly**: Do not assume events are independent without verifying that the probability of their intersection equals the product of their individual probabilities.

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Q1 JEE Main 2026 · 8 Apr · Shift 2 MCQ

A candidate has to go to the examination centre to appear in an examination. The candidate uses only one means of transportation for the entire distance out of bus, scooter and car. The probabilities of the candidate going by bus, scooter and car, respectively, are $\frac{2}{5}$, $\frac{1}{5}$ and $\frac{2}{5}$. The probabilities that the candidate reaches late at the examination centre are $\frac{1}{5}$, $\frac{1}{3}$ and $\frac{1}{4}$ if the candidate uses bus, scooter and car, respectively. Given that the candidate reached late at the examination centre, the probability that the candidate travelled by bus is :

(A) $\frac{11}{37}$
(B) $\frac{12}{37}$
(C) $\frac{13}{37}$
(D) $\frac{14}{37}$

Answer: (B) $\frac{12}{37}$ · Official NTA final key

Q2 JEE Main 2026 · 6 Apr · Shift 1 MCQ

A bag contains $(N+1)$ coins $-$ N fair coins, and one coin with 'Head' on both sides. A coin is selected at random and tossed. If the probability of getting 'Head' is $\frac{9}{16}$, then N is equal to:

(A) 5
(B) 7
(C) 8
(D) 9

Answer: (B) 7 · Official NTA final key

Q3 JEE Main 2026 · 6 Apr · Shift 2 MCQ

A bag contains 6 blue and 6 green balls. Pairs of balls are drawn without replacement until the bag is empty. The probability that each drawn pair consists of one blue and one green ball is :

(A) $\frac{63}{925}$
(B) $\frac{17}{231}$
(C) $\frac{16}{231}$
(D) $\frac{64}{925}$

Answer: (C) $\frac{16}{231}$ · Official NTA final key

Q4 JEE Main 2026 · 5 Apr · Shift 1 MCQ

A letter is known to have arrived by post either from KANPUR or from ANANTPUR. On the envelope just two consecutive letters AN are visible. The probability, that the letter came from ANANTPUR, is:

(A) $\frac{7}{10}$
(B) $\frac{10}{17}$
(C) $\frac{12}{19}$
(D) $\frac{7}{19}$

Answer: (B) $\frac{10}{17}$ · Official NTA final key

Q5 JEE Main 2026 · 5 Apr · Shift 2 MCQ

The probabilities that players A and B of a team are selected for the captaincy for a tournament are 0.6 and 0.4, respectively. If A is selected the captain, the probability that the team wins the tournament is 0.8 and if B is selected the captain, the probability that the team wins the tournament is 0.7. Then the probability, that the team wins the tournament, is :

(A) 0.74
(B) 0.76
(C) 0.72
(D) 0.78

Answer: (B) 0.76 · Official NTA final key

Q6 JEE Main 2026 · 4 Apr · Shift 1 Numerical

A coin is tossed 8 times. If the probability that exactly 4 heads appear in the first six tosses and exactly 3 heads appear in the last five tosses is p, then $96p$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 9. · Official NTA final key

Q7 JEE Main 2026 · 4 Apr · Shift 2 Numerical

From a month of 31 days, 3 different dates are selected at random. If the probability that these dates are in an increasing A.P. is equal to $\frac{a}{b}$, where $a, b \in \mathbb{N}$ and $\gcd(a, b) = 1$, then $a + b$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 944. · Official NTA final key

Q8 JEE Main 2026 · 2 Apr · Shift 1 Numerical

Let a, b, c $\in \{1, 2, 3, 4\}$. If the probability, that $\mathrm{a}x^2 + 2\sqrt{2}\,\mathrm{b}x + \mathrm{c} > 0$ for all $x \in \mathbf{R}$, is $\frac{\mathrm{m}}{\mathrm{n}}$, $\gcd(\mathrm{m}, \mathrm{n}) = 1$, then $\mathrm{m} + \mathrm{n}$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 81. · Official NTA final key

Q9 JEE Main 2026 · 2 Apr · Shift 2 MCQ

A man throws a fair coin repeatedly. He gets 10 points for each head he throws and 5 points for each tail he throws. If the probability that he gets exactly 30 points is $\frac{m}{n}$, gcd (m, n) = 1, then m + n is equal to :

(A) 53
(B) 55
(C) 107
(D) 105

Answer: (C) 107 · Official NTA final key

Q10 JEE Main 2026 · 28 Jan · Shift 1 MCQ

A bag contains 10 balls out of which k are red and $(10-k)$ are black, where $0 \le k \le 10$. If three balls are drawn at random without replacement and all of them are found to be black, then the probability that the bag contains 1 red and 9 black balls is:

(A) $\frac{7}{11}$
(B) $\frac{7}{55}$
(C) $\frac{14}{55}$
(D) $\frac{7}{110}$

Answer: (C) $\frac{14}{55}$ · Official NTA final key

Q11 JEE Main 2026 · 28 Jan · Shift 2 MCQ

The probability distribution of a random variable X is given below :

X	4k	$\frac{30}{7}$k	$\frac{32}{7}$k	$\frac{34}{7}$k	$\frac{36}{7}$k	$\frac{38}{7}$k	$\frac{40}{7}$k	6k
P(X)	$\frac{2}{15}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{1}{5}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{1}{5}$	$\frac{1}{15}$

If $E(X) = \frac{263}{15}$, then $P(X < 20)$ is equal to :

(A) $\frac{3}{5}$
(B) $\frac{14}{15}$
(C) $\frac{8}{15}$
(D) $\frac{11}{15}$

Answer: (D) $\frac{11}{15}$ · Official NTA final key

Q12 JEE Main 2026 · 24 Jan · Shift 1 MCQ

From a lot containing 10 defective and 90 non-defective bulbs, 8 bulbs are selected one by one with replacement. Then the probability of getting at least 7 defective bulbs is

(A) $\frac{67}{10^8}$
(B) $\frac{73}{10^8}$
(C) $\frac{7}{10^7}$
(D) $\frac{81}{10^8}$

Answer: (B) $\frac{73}{10^8}$ · Official NTA final key

Q13 JEE Main 2026 · 24 Jan · Shift 2 Numerical

Let S be a set of 5 elements and P(S) denote the power set of S. Let E be an event of choosing an ordered pair (A, B) from the set P(S) × P(S) such that $A \cap B = \emptyset$. If the probability of the event E is $\frac{3^p}{2^q}$, where p, q $\in \mathbb{N}$, then p + q is equal to _____.

Numerical value type: the answer is a number.

Answer: 15. · Official NTA final key

Q14 JEE Main 2026 · 23 Jan · Shift 1 Numerical

From the first 100 natural numbers, two numbers first a and then b are selected randomly without replacement. If the probability that $a - b \geq 10$ is $\frac{m}{n}$, $\gcd(m, n) = 1$, then $m + n$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 311. · Official NTA final key

Q15 JEE Main 2026 · 23 Jan · Shift 2 MCQ

Bag A contains 9 white and 8 black balls, while bag B contains 6 white and 4 black balls. One ball is randomly picked up from the bag B and mixed up with the balls in the bag A. Then a ball is randomly drawn from the bag A. If the probability, that the ball drawn is white, is $\frac{p}{q}$, $\gcd(p, q) = 1$, then $p + q$ is equal to

(A) 23
(B) 22
(C) 21
(D) 24

Answer: (A) 23 · Official NTA final key

Q16 JEE Main 2026 · 22 Jan · Shift 1 MCQ

Two distinct numbers a and b are selected at random from 1, 2, 3,..., 50. The probability, that their product ab is divisible by 3, is

(A) $\frac{8}{25}$
(B) $\frac{561}{1225}$
(C) $\frac{664}{1225}$
(D) $\frac{272}{1225}$

Answer: (C) $\frac{664}{1225}$ · Official NTA final key

Q17 JEE Main 2026 · 22 Jan · Shift 1 MCQ

If a random variable x has the probability distribution

x	0	1	2	3	4	5	6	7
P(x)	0	$2k$	k	$3k$	$2k^2$	$2k$	k^2+k	$7k^2$

then P($3 < x \leq 6$) is equal to

(A) 0.22
(B) 0.33
(C) 0.34
(D) 0.64

Answer: (B) 0.33 · Official NTA final key

Q18 JEE Main 2026 · 21 Jan · Shift 2 MCQ

A random variable X takes values $0, 1, 2, 3$ with probabilities $\frac{2a+1}{30}, \frac{8a-1}{30}, \frac{4a+1}{30}, b$ respectively, where a, b $\in \mathbf{R}$. Let μ and σ respectively be the mean and standard deviation of X such that $\sigma^2 + \mu^2 = 2$. Then $\frac{a}{b}$ is equal to :

(A) 12
(B) 3
(C) 60
(D) 30

Answer: (C) 60 · Official NTA final key

Q19 JEE Main 2025 · 8 Apr · Shift 2 MCQ

If A and B are two events such that $P(A) = 0.7, P(B) = 0.4$ and $P(A \cap \bar{B}) = 0.5$, where $\bar{B}$ denotes the complement of B, then $P(B \mid (A \cup \bar{B}))$ is equal to

(A) $\frac{1}{3}$
(B) $\frac{1}{4}$
(C) $\frac{1}{6}$
(D) $\frac{1}{2}$

Answer: (B) $\frac{1}{4}$ · Key from source paper

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Q20 JEE Main 2025 · 7 Apr · Shift 2 MCQ

Let a random variable X take values 0,1,2,3 with $P(X=0)=P(X=1)=p, P(X=2)=P(X=3)$ and $E\left(X^2\right)=2E(X)$. Then the value of $8p-1$ is:

(A) 0
(B) 2
(C) 3
(D) 1

Answer: (B) 2 · Key from source paper

Q21 JEE Main 2025 · 7 Apr · Shift 2 MCQ

A bag contains 19 unbiased coins and one coin with head on both sides. One coin drawn at random is tossed and head turns up. If the probability that the drawn coin was unbiased, is $\frac{m}{n}, \gcd(m,n)=1$, then n^2-m^2 is equal to :

(A) 72
(B) 64
(C) 60
(D) 80

Answer: (D) 80 · Key from source paper

Q22 JEE Main 2025 · 4 Apr · Shift 1 MCQ

The probability, of forming a 12 persons committee from 4 engineers, 2 doctors and 10 professors containing at least 3 engineers and at least 1 doctor, is

(A) $\frac{103}{182}$
(B) $\frac{17}{26}$
(C) $\frac{19}{26}$
(D) $\frac{129}{182}$

Answer: (D) $\frac{129}{182}$ · Key from source paper

Q23 JEE Main 2025 · 4 Apr · Shift 1 MCQ

A box contains 10 pens of which 3 are defective. A sample of 2 pens is drawn at random and let X denote the number of defective pens. Then the variance of X is

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(A) $\frac{2}{15}$
(B) $\frac{28}{75}$
(C) $\frac{11}{15}$
(D) $\frac{3}{5}$

Answer: (B) $\frac{28}{75}$ · Key from source paper

Q24 JEE Main 2025 · 4 Apr · Shift 2 Numerical

A card from a pack of 52 cards is lost. From the remaining 51 cards, n cards are drawn and are found to be spades. If the probability of the lost card to be a spade is $\frac{11}{50}$, then n is equal to _____ .

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q25 JEE Main 2025 · 3 Apr · Shift 2 MCQ

If the probability that the random variable X takes the value x is given by $P(X = x) = k(x + 1)3^{-x}, x = 0, 1, 2, 3 \ldots$, where k is a constant, then $P(X \geq 3)$ is equal to

(A) $\frac{4}{9}$
(B) $\frac{1}{9}$
(C) $\frac{7}{27}$
(D) $\frac{8}{27}$

Answer: (B) $\frac{1}{9}$ · Key from source paper

Q26 JEE Main 2025 · 2 Apr · Shift 1 Numerical

Three distinct numbers are selected randomly from the set $\{1, 2, 3, \ldots, 40\}$. If the probability, that the selected numbers are in an increasing G.P., is $\frac{m}{n}, \gcd(m, n) = 1$, then $m + n$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 2477. · Checked by our team

Q27 JEE Main 2025 · 2 Apr · Shift 2 MCQ

Given three identical bags each containing 10 balls, whose colours are as follows :

	Red	Blue	Green
Bag I	3	2	5
Bag II	4	3	3
Bag III	5	1	4

A person chooses a bag at random and takes out a ball. If the ball is Red, the probability that it is from bag I is p and if the ball is Green, the probability that it is from bag III is q, then the value of $\left(\frac{1}{p} + \frac{1}{q}\right)$ is :

(A) 7
(B) 6
(C) 8
(D) 9

Answer: (A) 7 · Key from source paper

Q28 JEE Main 2025 · 29 Jan · Shift 2 MCQ

Let $\mathrm{A} = [\mathrm{a_{ij}}]$ be a 2×2 matrix such that $\mathrm{a_{ij}} \in \{0, 1\}$ for all i and j. Let the random variable X denote the possible values of the determinant of the matrix A. Then, the variance of X is :

(A) $\frac{3}{4}$
(B) $\frac{5}{8}$
(C) $\frac{3}{8}$
(D) $\frac{1}{4}$

Answer: (C) $\frac{3}{8}$ · Key from source paper

Q29 JEE Main 2025 · 29 Jan · Shift 2 MCQ

Bag 1 contains 4 white balls and 5 black balls, and Bag 2 contains n white balls and 3 black balls. One ball is drawn randomly from Bag 1 and transferred to Bag 2. A ball is then drawn randomly from Bag 2. If the probability, that the ball drawn is white, is 29/45, then n is equal to :

(A) 6
(B) 3
(C) 5
(D) 4

Answer: (A) 6 · Key from source paper

Q30 JEE Main 2025 · 28 Jan · Shift 1 MCQ

Two number $\mathrm{k_1}$ and $\mathrm{k_2}$ are randomly chosen from the set of natural numbers. Then, the probability that the value of $\mathrm{i^{k_1} + i^{k_2}}$, $(\mathrm{i} = \sqrt{-1})$ is non-zero, equals

(A) $\frac{1}{2}$
(B) $\frac{3}{4}$
(C) $\frac{1}{4}$
(D) $\frac{2}{3}$

Answer: (B) $\frac{3}{4}$ · Key from source paper

Q31 JEE Main 2025 · 28 Jan · Shift 1 MCQ

Three defective oranges are accidently mixed with seven good ones and on looking at them, it is not possible to differentiate between them. Two oranges are drawn at random from the lot. If x denote

the number of defective oranges, then the variance of x is

(A) 28/75
(B) 18/25
(C) 26/75
(D) 14/25

Answer: (A) 28/75 · Key from source paper

Q32 JEE Main 2025 · 28 Jan · Shift 2 MCQ

Let S be the set of all the words that can be formed by arranging all the letters of the word GARDEN. From the set S, one word is selected at random. The probability that the selected word will NOT have vowels in alphabetical order is :

(A) $\frac{1}{2}$
(B) $\frac{1}{4}$
(C) $\frac{2}{3}$
(D) $\frac{1}{3}$

Answer: (A) $\frac{1}{2}$ · Key from source paper

Q33 JEE Main 2025 · 28 Jan · Shift 2 MCQ

Bag B_1 contains 6 white and 4 blue balls, Bag B_2 contains 4 white and 6 blue balls, and Bag B_3 contains 5 white and 5 blue balls. One of the bags is selected at random and a ball is drawn from it. If the ball is white, then the probability, that the ball is drawn from Bag B_2, is :

(A) $\frac{4}{15}$
(B) $\frac{1}{3}$
(C) $\frac{2}{5}$
(D) $\frac{2}{3}$

Answer: (A) $\frac{4}{15}$ · Key from source paper

Q34 JEE Main 2025 · 24 Jan · Shift 1 MCQ

A and B alternately throw a pair of dice. A wins if he throws a sum of 5 before B throws a sum of 8 , and B wins if he throws a sum of 8 before A throws a sum of 5 . The probability, that A wins if A makes the first throw, is

(A) $\frac{8}{17}$
(B) $\frac{9}{19}$
(C) $\frac{9}{17}$
(D) $\frac{8}{19}$

Answer: (B) $\frac{9}{19}$ · Key from source paper

Q35 JEE Main 2025 · 24 Jan · Shift 2 MCQ

Let $A = [a_{ij}]$ be a square matrix of order 2 with entries either 0 or 1 . Let E be the event that A is an invertible matrix. Then the probability P(E) is :

(A) $\frac{3}{16}$
(B) $\frac{5}{8}$
(C) $\frac{3}{8}$
(D) $\frac{1}{8}$

Answer: (C) $\frac{3}{8}$ · Key from source paper

Q36 JEE Main 2025 · 23 Jan · Shift 1 MCQ

One die has two faces marked 1 , two faces marked 2 , one face marked 3 and one face marked 4 . Another die has one face marked 1 , two faces marked 2 , two faces marked 3 and one face marked 4. The probability of getting the sum of numbers to be 4 or 5 , when both the dice are thrown together, is

(A) $\frac{2}{3}$
(B) $\frac{1}{2}$
(C) $\frac{4}{9}$
(D) $\frac{3}{5}$

Answer: (B) $\frac{1}{2}$ · Key from source paper

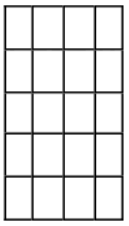
Q37 JEE Main 2025 · 23 Jan · Shift 2 MCQ

A board has 16 squares as shown in the figure:

(see the figure above)

Out of these 16 squares, two squares are chosen at random. The probability that they have no side in common is :

Q17. A board has 16 squares as shown in the figure:



Out of these 16 squares, two squares are chosen at random. The probability that they have no side in common is :

(1) 7/10 (2) 4/5
(3) 23/30 (4) 3/5

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(A) 7/10
(B) 4/5
(C) 23/30
(D) 3/5

Answer: (B) 4/5 · Key from source paper

Q38 JEE Main 2025 · 22 Jan · Shift 1 MCQ

Two balls are selected at random one by one without replacement from a bag containing 4 white and 6 black balls. If the probability that the first selected ball is black, given that the second selected ball is also black, is $\frac{m}{n}$, where $\gcd(m, n) = 1$, then $m + n$ is equal to :

(A) 4
(B) 14
(C) 13
(D) 11

Answer: (B) 14 · Key from source paper

Q39 JEE Main 2025 · 22 Jan · Shift 1 MCQ

A coin is tossed three times. Let X denote the number of times a tail follows a head. If μ and σ^2 denote the mean and variance of X, then the value of $64\left(\mu + \sigma^2\right)$ is :

(A) 51
(B) 64
(C) 32
(D) 48

Answer: (D) 48 · Key from source paper

Q40 JEE Main 2025 · 22 Jan · Shift 2 MCQ

If A and B are two events such that $P(A \cap B) = 0.1$, and $P(A \mid B)$ and $P(B \mid A)$ are the roots of the equation $12x^2 - 7x + 1 = 0$, then the value of $\frac{P(\overline{A} \cup B)}{P(\overline{A} \cap \overline{B})}$ is :

(A) $\frac{4}{3}$
(B) $\frac{7}{4}$
(C) $\frac{5}{3}$
(D) $\frac{9}{4}$

Answer: (D) $\frac{9}{4}$ · Key from source paper

Q41 JEE Main 2024 · 9 Apr · Shift 1 Numerical

Let a, b and c denote the outcome of three independent rolls of a fair tetrahedral die, whose four faces are marked 1, 2, 3, 4. If the probability that $ax^2 + bx + c = 0$ has all real roots is $\frac{m}{n}$, gcd(m, n) =

1, then m + n is equal to _____

Numerical value type: the answer is a number.

Answer: 19. · Key from source paper

Q42 JEE Main 2024 · 9 Apr · Shift 2 MCQ

If an unbiased dice is rolled thrice, then the probability of getting a greater number in the ith roll than the number obtained in the $(i-1)^{\text{th}}$ roll, $i = 2, 3$, is equal to

(A) 3/54
(B) 2/54
(C) 1/54
(D) 5/54

Answer: (D) 5/54 · Key from source paper

Q43 JEE Main 2024 · 8 Apr · Shift 1 MCQ

Let the sum of two positive integers be 24 . If the probability, that their product is not less than $\frac{3}{4}$ times their greatest possible product, is $\frac{m}{n}$, where $\gcd(m, n) = 1$, then $n - m$ equals

(A) 10
(B) 9
(C) 11
(D) 8

Answer: (A) 10 · Key from source paper

Q44 JEE Main 2024 · 8 Apr · Shift 1 Numerical

Three balls are drawn at random from a bag containing 5 blue and 4 yellow balls. Let the random variables X and Y respectively denote the number of blue and yellow balls. If $\bar{X}$ and $\bar{Y}$ are the means of X and Y respectively, then $7\bar{X} + 4\bar{Y}$ is equal to _____

Numerical value type: the answer is a number.

Answer: 17. · Key from source paper

Q45 JEE Main 2024 · 8 Apr · Shift 2 MCQ

There are three bags X, Y and Z. Bag X contains 5 one-rupee coins and 4 five-rupee coins; Bag Y contains 4 one-rupee coins and 5 five-rupee coins and Bag Z contains 3 one-rupee coins and 6 five-rupee coins. A bag is selected at random and a coin drawn from it at random is found to be a one-rupee coin. Then the probability, that it came from bag Y, is :

(A) $\frac{1}{4}$
(B) $\frac{1}{2}$
(C) $\frac{5}{12}$
(D) $\frac{1}{3}$

Answer: (D) $\frac{1}{3}$ · Key from source paper

Q46 JEE Main 2024 · 6 Apr · Shift 1 MCQ

A company has two plants A and B to manufacture motorcycles. 60% motorcycles are manufactured at plant A and the remaining are manufactured at plant B.80% of the motorcycles manufactured at plant A are rated of the standard quality, while 90% of the motorcycles manufactured at plant B are rated of the standard quality. A motorcycle picked up randomly from the total production is found to be of the standard quality. If p is the probability that it was manufactured at plant B, then $126p$ is

(A) 54
(B) 66
(C) 64
(D) 56

Answer: (A) 54 · Key from source paper

Q47 JEE Main 2024 · 6 Apr · Shift 2 MCQ

If three letters can be posted to any one of the 5 different addresses, then the probability that the three letters are posted to exactly two addresses is:

(A) $\frac{18}{25}$
(B) $\frac{12}{25}$
(C) $\frac{6}{25}$
(D) $\frac{4}{25}$

Answer: (B) $\frac{12}{25}$ · Key from source paper

Q48 JEE Main 2024 · 6 Apr · Shift 2 Numerical

From a lot of 12 items containing 3 defectives, a sample of 5 items is drawn at random. Let the random variable X denote the number of defective items in the sample. Let items in the sample be drawn one by one without replacement. If variance of X is $\frac{m}{n}$, where $\gcd(m, n) = 1$, then $n - m$ is equal to _____

Numerical value type: the answer is a number.

Answer: 71. · Key from source paper

Q49 JEE Main 2024 · 5 Apr · Shift 1 MCQ

The coefficients a, b, c in the quadratic equation $ax^2 + bx + c = 0$ are chosen from the set $\{1, 2, 3, 4, 5, 6, 7, 8\}$. The probability of this equation having repeated roots is :

(A) $\frac{1}{128}$
(B) $\frac{1}{64}$
(C) $\frac{3}{256}$
(D) $\frac{3}{128}$

Answer: (B) $\frac{1}{64}$ · Key from source paper

Q50 JEE Main 2024 · 5 Apr · Shift 1 Numerical

From a lot of 10 items, which include 3 defective items, a sample of 5 items is drawn at random. Let the random variable X denote the number of defective items in the sample. If the variance of X is σ^2, then $96\sigma^2$ is equal to _____

Numerical value type: the answer is a number.

Answer: 56. · Key from source paper

Q51 JEE Main 2024 · 5 Apr · Shift 2 MCQ

The coefficients a, b, c in the quadratic equation $ax^2 + bx + c = 0$ are from the set $\{1, 2, 3, 4, 5, 6\}$. If the probability of this equation having one real root bigger than the other is p, then 216 p equals :

(A) 57
(B) 76
(C) 38
(D) 19

Answer: (C) 38 · Key from source paper

Q52 JEE Main 2024 · 5 Apr · Shift 2 Numerical

Let the mean and the standard deviation of the probability distribution

X	α	**1**	**0**	-3
P(X)	$\frac{1}{3}$	K	$\frac{1}{6}$	$\frac{1}{4}$

be μ and σ, respectively. If $\sigma - \mu = 2$, then $\sigma + \mu$ is equal to _____

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q53 JEE Main 2024 · 4 Apr · Shift 1 MCQ

Three urns A, B and C contain 7 red, 5 black; 5 red, 7 black and 6 red, 6 black balls, respectively. One of the urn is selected at random and a ball is drawn from it. If the ball drawn is black, then the

probability that it is drawn from urn A is :

(A) $\frac{5}{18}$
(B) $\frac{5}{16}$
(C) $\frac{4}{17}$
(D) $\frac{7}{18}$

Answer: (A) $\frac{5}{18}$ · Key from source paper

Q54 JEE Main 2024 · 4 Apr · Shift 2 MCQ

If the mean of the following probability distribution of a random variable X :

X	0	2	4	6	8
P(X)	a	$2a$	$a+b$	$2b$	$3b$

is $\frac{46}{9}$, then the variance of the distribution is

(A) $\frac{173}{27}$
(B) $\frac{566}{81}$
(C) $\frac{151}{27}$
(D) $\frac{581}{81}$

Answer: (B) $\frac{566}{81}$ · Key from source paper

Q55 JEE Main 2024 · 4 Apr · Shift 2 Numerical

In a tournament, a team plays 10 matches with probabilities of winning and losing each match as $\frac{1}{3}$ and $\frac{2}{3}$ respectively. Let x be the number of matches that the team wins, and y be the number of matches that team loses. If the probability $\mathrm{P}(|x-y| \leq 2)$ is p, then $3^9 p$ equals _____

Numerical value type: the answer is a number.

Answer: 8288. · Key from source paper

Q56 JEE Main 2024 · 1 Feb · Shift 1 MCQ

A bag contains 8 balls, whose colours are either white or black. 4 balls are drawn at random without replacement and it was found that 2 balls are white and other 2 balls are black. The probability that the bag contains equal number of white and black balls is:

(A) $\frac{2}{5}$
(B) $\frac{2}{7}$
(C) $\frac{1}{7}$
(D) $\frac{1}{5}$

Answer: (B) $\frac{2}{7}$ · Key from source paper

Q57 JEE Main 2024 · 1 Feb · Shift 2 MCQ

Let Ajay will not appear in JEE exam with probability $p = \frac{2}{7}$, while both Ajay and Vijay will appear in the exam with probability $q = \frac{1}{5}$. Then the probability, that Ajay will appear in the exam and Vijay will not appear is:

(A) $\frac{9}{35}$
(B) $\frac{18}{35}$
(C) $\frac{24}{35}$
(D) $\frac{3}{35}$

Answer: (B) $\frac{18}{35}$ · Key from source paper

Q58 JEE Main 2024 · 31 Jan · Shift 1 MCQ

Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles, with replacement being made after each drawing. Then the probability, that first drawn marble is red and second drawn marble is white, is

(A) $\frac{2}{25}$
(B) $\frac{4}{25}$
(C) $\frac{2}{3}$
(D) $\frac{4}{75}$

Answer: (D) $\frac{4}{75}$ · Key from source paper

Q59 JEE Main 2024 · 31 Jan · Shift 1 MCQ

Three rotten apples are accidentally mixed with fifteen good apples. Assuming the random variable x to be the number of rotten apples in a draw of two apples, the variance of x is

(A) $\frac{37}{153}$
(B) $\frac{57}{153}$
(C) $\frac{47}{153}$
(D) $\frac{40}{153}$

Answer: (D) $\frac{40}{153}$ · Key from source paper

Q60 JEE Main 2024 · 31 Jan · Shift 2 MCQ

A coin is biased so that a head is twice as likely to occur as a tail. If the coin is tossed 3 times, then the probability of getting two tails and one head is-

EdLoop JEE

(A) $\frac{2}{9}$
(B) $\frac{1}{9}$
(C) $\frac{2}{27}$
(D) $\frac{1}{27}$

Answer: (A) $\frac{2}{9}$ · Key from source paper

Q61 JEE Main 2024 · 30 Jan · Shift 1 MCQ

Two integers x and y are chosen with replacement from the set $\{0, 1, 2, 3, \ldots\ldots, 10\}$. Then the probability that $|x - y| > 5$ is :

(A) $\frac{30}{121}$
(B) $\frac{62}{121}$
(C) $\frac{60}{121}$
(D) $\frac{31}{121}$

Answer: (A) $\frac{30}{121}$ · Key from source paper

Q62 JEE Main 2024 · 30 Jan · Shift 2 MCQ

Bag A contains 3 white, 7 red balls and bag B contains 3 white, 2 red balls. One bag is selected at random and a ball is drawn from it. The probability of drawing the ball from the bag A, if the ball drawn in white, is :

(A) $\frac{1}{4}$
(B) $\frac{1}{9}$
(C) $\frac{1}{3}$
(D) $\frac{3}{10}$

Answer: (C) $\frac{1}{3}$ · Key from source paper

Q63 JEE Main 2024 · 29 Jan · Shift 1 MCQ

A fair die is thrown until 2 appears. Then the probability, that 2 appears in even number of throws, is

(A) $\frac{5}{6}$
(B) $\frac{1}{6}$
(C) $\frac{5}{11}$
(D) $\frac{6}{11}$

Answer: (C) $\frac{5}{11}$ · Key from source paper

Q64 JEE Main 2024 · 29 Jan · Shift 2 MCQ

An integer is chosen at random from the integers 1, 2, 3, ..., 50. The probability that the chosen integer is a multiple of atleast one of 4, 6 and 7 is

(A) $\frac{8}{25}$
(B) $\frac{21}{50}$
(C) $\frac{9}{50}$
(D) $\frac{14}{25}$

Answer: (B) $\frac{21}{50}$ · Key from source paper

Q65 JEE Main 2024 · 27 Jan · Shift 1 Numerical

A fair die is tossed repeatedly until a six is obtained. Let X denote the number of tosses required and let $a = P(X = 3)$, $b = P(X \geq 3)$ and $c = P(X \geq 6 \mid X > 3)$. Then $\frac{b+c}{a}$ is equal to

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q66 JEE Main 2024 · 27 Jan · Shift 2 MCQ

An urn contains 6 white and 9 black balls. Two successive draws of 4 balls are made without replacement. The probability, that the first draw gives all white balls and the second draw gives all black balls, is :

(A) $\frac{5}{256}$
(B) $\frac{5}{715}$
(C) $\frac{3}{715}$
(D) $\frac{3}{256}$

Answer: (C) $\frac{3}{715}$ · Key from source paper

Q67 JEE Main 2023 · 15 Apr · Shift 1 MCQ

A bag contains 6 white and 4 black balls. A die is rolled once and the number of balls equal to the number obtained on the die are drawn from the bag at random. The probability that all the balls drawn are white is

(A) $\frac{1}{4}$
(B) $\frac{11}{50}$
(C) $\frac{1}{5}$
(D) $\frac{9}{50}$

Answer: (C) $\frac{1}{5}$ · Key from source paper

Q68 JEE Main 2023 · 13 Apr · Shift 1 MCQ

A coin is biased so that the head is 3 times as likely to occur as tail. This coin is tossed until a head or three tails occur. If X denotes the number of tosses of the coin, then the mean of X is

EdLoop JEE

(A) $\frac{38}{16}$
(B) $\frac{15}{16}$
(C) $\frac{21}{16}$
(D) $\frac{81}{64}$

Answer: (C) $\frac{21}{16}$ · Key from source paper

Q69 JEE Main 2023 · 13 Apr · Shift 2 MCQ

The random variable X follows binomial distribution $B(n, p)$, for which the difference of the mean and the variance is 1. If $2\,P(X = 2) = 3\,P(X = 1)$, then $n^2 P(X > 1)$ is equal to

(A) 15
(B) 11
(C) 12
(D) 16

Answer: (B) 11 · Key from source paper

Q70 JEE Main 2023 · 12 Apr · Shift 1 MCQ

Two dice A and B are rolled. Let the numbers obtained on A and B be α and β respectively. If the variance of $\alpha - \beta$ is $\frac{p}{q}$, where p and q are co-prime, then the sum of the positive divisors of p is equal to

(A) 72
(B) 36
(C) 48
(D) 31

Answer: (C) 48 · Key from source paper

Q71 JEE Main 2023 · 12 Apr · Shift 1 Numerical

A fair n $(n > 1)$ faces die is rolled repeatedly until a number less than n appears. If the mean of the number of tosses required is $\frac{n}{9}$, then n is equal to

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q72 JEE Main 2023 · 11 Apr · Shift 1 MCQ

Let $S = M = a_{ij},\ a_{ij} \in 0, 1, 2,\ 1 \le i, j \le 2$ be a sample space and $AM \in S : M$ is invertible be an even. Then PA is equal to

(A) $\frac{16}{27}$
(B) $\frac{47}{81}$
(C) $\frac{49}{81}$
(D) $\frac{50}{81}$

Answer: (D) $\frac{50}{81}$ · Key from source paper

Q73 JEE Main 2023 · 11 Apr · Shift 2 Numerical

Let the probability of getting head for a biased coin be $\frac{1}{4}$. It is tossed repeatedly until a head appears. Let N be the number of tosses required. If the probability that the equation $64x^2 + 5Nx + 1 = 0$ has no real root is $\frac{p}{q}$, where p and q are co-prime, then $q - p$ is equal to _____

Numerical value type: the answer is a number.

Answer: 27. · Key from source paper

Q74 JEE Main 2023 · 10 Apr · Shift 1 MCQ

Let N denote the sum of the numbers obtained when two dice are rolled. If the probability that $2^N < N!$ is $\frac{m}{n}$, where m and n are coprime, then $4m - 3n$ is equal to

(A) 6
(B) 12
(C) 10
(D) 8

Answer: (D) 8 · Key from source paper

Q75 JEE Main 2023 · 10 Apr · Shift 2 MCQ

Let a die be rolled n times. Let the probability of getting odd numbers seven times be equal to the probability of getting odd numbers nine times. If the probability of getting even numbers twice is $\frac{k}{2^{15}}$, then k is equal to

(A) 60
(B) 15
(C) 90
(D) 30

Answer: (A) 60 · Key from source paper

Q76 JEE Main 2023 · 8 Apr · Shift 1 MCQ

In a bolt factory, machines A, B and C manufacture respectively 20%, 30% and 50% of the total bolts. Of their output 3, 4 and 2 percent are respectively defective bolts. A bolt is drawn at random from the product. If the bolt drawn is found the defective then the probability that it is manufactured by the machine C is

(A) $\frac{5}{14}$
(B) $\frac{9}{28}$
(C) $\frac{3}{7}$
(D) $\frac{2}{7}$

Answer: (A) $\frac{5}{14}$ · Key from source paper

Q77 JEE Main 2023 · 8 Apr · Shift 2 MCQ

If the probability that the random variable X takes values x is given by $P(X = x) = k(x + 1)3^{-x}$, $x = 0, 1, 2, 3, \ldots\ldots$, where k is a constant, then $P(X \geq 2)$ is equal to

(A) $\frac{7}{27}$
(B) $\frac{7}{18}$
(C) $\frac{11}{18}$
(D) $\frac{20}{27}$

Answer: (A) $\frac{7}{27}$ · Key from source paper

Q78 JEE Main 2023 · 6 Apr · Shift 1 MCQ

A pair of dice is thrown 5 times. For each throw, a total of 5 is considered a success. If the probability of at least 4 successes is $\frac{k}{3^{11}}$, then k is equal to

(A) 82
(B) 75
(C) 164
(D) 123

Answer: (D) 123 · Key from source paper

Q79 JEE Main 2023 · 6 Apr · Shift 2 MCQ

Three dice are rolled. If the probability of getting different numbers on the three dice is $\frac{p}{q}$, where p and q are co-prime, then $q - p$ is equal to

(A) 2
(B) 1
(C) 3
(D) 4

Answer: (D) 4 · Key from source paper

Q80 JEE Main 2023 · 1 Feb · Shift 1 MCQ

In a binomial distribution B(n, p), the sum and product of the mean & variance are 5 and 6 respectively, then find $6(n + p - q)$ is equal to :-

(A) 51
(B) 52
(C) 53
(D) 50

Answer: (B) 52 · Key from source paper

Q81 JEE Main 2023 · 1 Feb · Shift 2 MCQ

Two dice are thrown independently. Let A be the event that the number appeared on the 1st die is less than the number appeared on the 2nd die, B be the event that the number appeared on the 1st die is even and that on the second die is odd, and C be the event that the number appeared on the 1st die is odd and that on the 2nd is even. Then

(A) The number of favourable cases of the event $(\mathrm{A} \cup \mathrm{B}) \cap \mathrm{C}$ is 6
(B) A and B are mutually exclusive
(C) The number of favourable cases of the events A, B and C are 15, 6 and 6 respectively
(D) B and C are independent

Answer: (A) The number of favourable cases of the event $(\mathrm{A} \cup \mathrm{B}) \cap \mathrm{C}$ is 6 · Key from source paper

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Q82 JEE Main 2023 · 31 Jan · Shift 1 MCQ

A bag contains 6 balls. Two balls are drawn from it at random and both are found to be black. The probability that the bag contains at least 5 black balls is

(A) $\frac{5}{7}$
(B) $\frac{2}{7}$
(C) $\frac{3}{7}$
(D) $\frac{5}{6}$

Answer: (A) $\frac{5}{7}$ · Key from source paper

Q83 JEE Main 2023 · 31 Jan · Shift 2 Numerical

Let A be the event that the absolute difference between two randomly chosen real numbers in the sample space $[0, 60]$ is less than or equal to a. If $P(A) = \frac{11}{36}$, then a is equal to _____ .

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q84 JEE Main 2023 · 30 Jan · Shift 1 MCQ

If an unbiased die, marked with -2, -1, 0, 1, 2, 3 on its faces is thrown five times, then the probability that the product of the outcomes is positive, is :

(A) $\frac{881}{2592}$
(B) $\frac{521}{2592}$
(C) $\frac{440}{2592}$
(D) $\frac{27}{288}$

Answer: (B) $\frac{521}{2592}$ · Key from source paper

Q85 JEE Main 2023 · 30 Jan · Shift 2 Numerical

A bag contains six balls of different colours. Two balls are drawn in succession with replacement. The probability that both the balls are of the same colour is p. Next four balls are drawn in succession with replacement and the probability that exactly three balls are of the same colours is q. If $p : q = m : n$, where m and n are co-prime, then $m + n$ is equal to

Numerical value type: the answer is a number.

Answer: 14. · Key from source paper

Q86 JEE Main 2023 · 29 Jan · Shift 1 MCQ

There rotten apples are mixed accidently with seven good apples and four apples are drawn one by one without replacement. Let the random variable X denote the number of rotten apples. If μ and σ^2 represent mean and variance of X, respectively, then $10(\mu^2 + \sigma^2)$ is equal to

(A) 20
(B) 250
(C) 25
(D) 30

Answer: (A) 20 · Key from source paper

Q87 JEE Main 2023 · 29 Jan · Shift 2 MCQ

Let $S = \{w_1, w_2, \ldots.\}$ be the sample space associated to a random experiment. Let $P(w_n) = \frac{P(w_{n-1})}{2}$, $n \geq 2$. Let $A = \{2k + 3l;\ k,\ l \in \mathbb{N}\}$ and $B = \{w_n;\ n \in A\}$. Then $P(B)$ is equal to

(A) $\frac{3}{32}$
(B) $\frac{3}{64}$
(C) $\frac{1}{16}$
(D) $\frac{1}{32}$

Answer: (B) $\frac{3}{64}$ · Key from source paper

Q88 JEE Main 2023 · 25 Jan · Shift 1 MCQ

Let M be the maximum value of the product of two positive integers when their sum is 66 . Let the sample space $S = \{x \in Z : x(66 - x) \geq \frac{5}{9}M\}$ and the event $\mathrm{A} = \{\mathrm{x} \in \mathrm{S} : \mathrm{x}$ is a multiple of $3\}$. Then P(A) is equal to

(A) $\frac{15}{44}$
(B) $\frac{1}{3}$
(C) $\frac{1}{5}$
(D) $\frac{7}{22}$

Answer: (B) $\frac{1}{3}$ · Key from source paper

Q89 JEE Main 2023 · 25 Jan · Shift 2 MCQ

Let N be the sum of the numbers appeared when two fair dice are rolled and let the probability that $\mathrm{N}-2, \sqrt{3\mathrm{N}}, \mathrm{N}+2$ are in geometric progression be $\frac{k}{48}$. Then the value of k is

(A) 2
(B) 4
(C) 16
(D) 8

Answer: (B) 4 · Key from source paper

Q90 JEE Main 2023 · 25 Jan · Shift 2 Numerical

25% of the population are smokers. A smoker has 27 times more chances to develop lung cancer then a non-smoker. A person is diagnosed with lung cancer and the probability that this person is a smoker is $\frac{k}{10}$. Then the value of k is _____ .

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q91 JEE Main 2023 · 24 Jan · Shift 1 MCQ

Let Ω be the sample space and $A \subseteq \Omega$ be an event. Given below are two statements:

(S1): If $P(A)=0$, then $A=\phi$

(S2): If $P(A)=1$, then $A=\Omega$

Then

(A) only (S1) is true
(B) only (S2) is true
(C) both (S1) and (S2) are true
(D) both (S1) and (S2) are false

Answer: (C) both (S1) and (S2) are true · Key from source paper

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Q92 JEE Main 2023 · 24 Jan · Shift 2 Numerical

The urns A, B and C contains 4 red, 6 black; 5 red, 5 black and λ red, 4 black balls respectively. One of the urns is selected at random and a ball is drawn. If the ball drawn is red and the probability that it

is drawn from urn C is 0.4, then the square of length of the side of largest equilateral triangle, inscribed in the parabola $y^2 = \lambda x$ with one vertex at vertex of parabola is

Numerical value type: the answer is a number.

Answer: 432. · Key from source paper

Q93 JEE Main 2022 · 29 Jul · Shift 1 MCQ

Let $S = \{1, 2, 3, \ldots, 2022\}$. Then the probability, that a randomly chosen number n from the set S such that $HCF(n, 2022) = 1$, is

(A) $\frac{128}{1011}$
(B) $\frac{166}{1011}$
(C) $\frac{127}{337}$
(D) $\frac{112}{337}$

Answer: (D) $\frac{112}{337}$ · Key from source paper

Q94 JEE Main 2022 · 29 Jul · Shift 2 MCQ

Bag I contains 3 red, 4 black and 3 white balls and Bag II contains 2 red, 5 black and 2 white balls. One ball is transferred from Bag I to Bag II and then a ball is draw from Bag II. The ball so drawn is found to be black in colour. Then the probability, that the transferred ball is red, is

(A) $\frac{4}{9}$
(B) $\frac{5}{18}$
(C) $\frac{1}{6}$
(D) $\frac{3}{10}$

Answer: (B) $\frac{5}{18}$ · Key from source paper

Q95 JEE Main 2022 · 29 Jul · Shift 2 Numerical

The sum and product of the mean and variance of a binomial distribution are 82.5 and 1350 respectively. They the number of trials in the binomial distribution is

Numerical value type: the answer is a number.

Answer: 96. · Key from source paper

Q96 JEE Main 2022 · 28 Jul · Shift 1 MCQ

Out of 60% female and 40% male candidates appearing in an exam, 60% candidates qualify it. The number of females qualifying the exam is twice the number of males qualifying it. A candidate is randomly chosen from the qualified candidates. The probability, that the chosen candidate is a female, is

(A) $\frac{2}{3}$
(B) $\frac{11}{16}$
(C) $\frac{23}{32}$
(D) $\frac{13}{16}$

Answer: (A) $\frac{2}{3}$ · Key from source paper

Q97 JEE Main 2022 · 28 Jul · Shift 2 MCQ

Let A and B be two events such that $P(B \mid A) = \frac{2}{5}$, $P(A \mid B) = \frac{1}{7}$ and $P(A \cap B) = \frac{1}{9}$. Consider
(S1) $P(A' \cup B) = \frac{5}{6}$,
(S2) $P(A' \cap B') = \frac{1}{18}$. Then

(A) Both (S1) and (S2) are true
(B) Both $(S1)$ and $(S2)$ are false
(C) Only $(S1)$ is true
(D) Only $(S2)$ is true

Answer: (A) Both (S1) and (S2) are true · Key from source paper

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Q98 JEE Main 2022 · 28 Jul · Shift 2 Numerical

A bag contains 4 white and 6 black balls. Three balls are drawn at random from the bag. Let X be the number of white balls, among the drawn balls. If σ^2 is the variance of X, then $100\sigma^2$ is equal to

Numerical value type: the answer is a number.

Answer: 56. · Key from source paper

Q99 JEE Main 2022 · 27 Jul · Shift 1 MCQ

Let S be the sample space of all five digit numbers. If p is the probability that a randomly selected number from S, is a multiple of 7 but not divisible by 5, then $9p$ is equal to

(A) 1.0146
(B) 1.2085
(C) 1.0285
(D) 1.1521

Answer: (C) 1.0285 · Key from source paper

Q100 JEE Main 2022 · 27 Jul · Shift 2 MCQ

Let X have a binomial distribution $B(n, p)$ such that the sum and the product of the mean and variance of X are 24 and 128 respectively. If $P(X > n - 3) = \frac{k}{2^n}$, then k is equal to

(A) 528
(B) 529
(C) 629
(D) 630

Answer: (B) 529 · Key from source paper

Q101 JEE Main 2022 · 27 Jul · Shift 2 MCQ

A six faced die is biased such that $3 \times P(\text{a prime number}) = 6 \times P(\text{a composite number}) = 2 \times P(1)$. Let X be a random variable that counts the number of times one gets a perfect square on some throws of this die. If the die is thrown twice, then the mean of X is

(A) $\frac{3}{11}$
(B) $\frac{5}{11}$
(C) $\frac{7}{11}$
(D) $\frac{8}{11}$

Answer: (D) $\frac{8}{11}$ · Key from source paper

Q102 JEE Main 2022 · 26 Jul · Shift 1 MCQ

The mean and variance of a binomial distribution are α and $\frac{\alpha}{3}$ respectively. If $P(X = 1) = \frac{4}{243}$, then $P(X = 4 \text{ or } 5)$ is equal to:

(A) $\frac{5}{9}$
(B) $\frac{64}{81}$
(C) $\frac{16}{27}$
(D) $\frac{145}{243}$

Answer: (C) $\frac{16}{27}$ · Key from source paper

Q103 JEE Main 2022 · 26 Jul · Shift 1 MCQ

Let E_1, E_2, E_3 be three mutually exclusive events such that $P(E_1) = \frac{2+3p}{6}$, $P(E_2) = \frac{2-p}{8}$ and $P(E_3) = \frac{1-p}{2}$. If the maximum and minimum values of p are p_1 and p_2 then $(p_1 + p_2)$ is equal to:

(A) $\frac{2}{3}$
(B) $\frac{5}{3}$
(C) $\frac{5}{4}$
(D) 1

Answer: (B) $\frac{5}{3}$ · Key from source paper

Q104 JEE Main 2022 · 26 Jul · Shift 2 MCQ

Let X be a binomially distributed random variable with mean 4 and variance $\frac{4}{3}$. Then $54\ PX \leq 2$ is equal to

(A) $\frac{73}{27}$
(B) $\frac{146}{27}$
(C) $\frac{146}{81}$
(D) $\frac{126}{81}$

Answer: (B) $\frac{146}{27}$ · Key from source paper

Q105 JEE Main 2022 · 25 Jul · Shift 1 MCQ

If the sum and the product of mean and variance of a binomial distribution are 24 and 128 respectively, then the probability of one or two successes is :

(A) $\frac{33}{2^{32}}$
(B) $\frac{33}{2^{29}}$
(C) $\frac{33}{2^{28}}$
(D) $\frac{33}{2^{27}}$

Answer: (C) $\frac{33}{2^{28}}$ · Key from source paper

Q106 JEE Main 2022 · 25 Jul · Shift 1 MCQ

If the numbers appeared on the two throws of a fair six faced die are α and β, then the probability that $x^2 + \alpha x + \beta > 0$, for all $x \in R$, is

(A) $\frac{17}{36}$
(B) $\frac{4}{9}$
(C) $\frac{1}{2}$
(D) $\frac{19}{36}$

Answer: (A) $\frac{17}{36}$ · Key from source paper

Q107 JEE Main 2022 · 25 Jul · Shift 2 MCQ

If A and B are two events such that $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{5}$ and $P(A \cup B) = \frac{1}{2}$, then $P(A|B') + P(B|A')$ is equal to

(A) $\frac{3}{4}$
(B) $\frac{5}{8}$
(C) $\frac{5}{4}$
(D) $\frac{7}{8}$

Answer: (B) $\frac{5}{8}$ · Key from source paper

Q108 JEE Main 2022 · 29 Jun · Shift 1 MCQ

The probability that a randomly chosen 2×2 matrix with all the entries from the set of first 10 primes, is singular, is equal to

(A) $\frac{133}{10^4}$
(B) $\frac{19}{10^3}$
(C) $\frac{18}{10^3}$
(D) $\frac{271}{10^4}$

Answer: (B) $\frac{19}{10^3}$ · Key from source paper

Q109 JEE Main 2022 · 28 Jun · Shift 1 MCQ

The probability, that in a randomly selected 3-digit number at least two digits are odd, is

(A) $\frac{19}{36}$
(B) $\frac{16}{36}$
(C) $\frac{19}{33}$
(D) $\frac{13}{36}$

Answer: (A) $\frac{19}{36}$ · Key from source paper

Q110 JEE Main 2022 · 28 Jun · Shift 2 MCQ

The probability that a randomly chosen one-one function from the set $\{a, b, c, d\}$ to the set $\{1, 2, 3, 4, 5\}$ satisfied $f(a) + 2f(b) - f(c) = f(d)$ is

(A) $\frac{1}{24}$
(B) $\frac{1}{40}$
(C) $\frac{1}{30}$
(D) $\frac{1}{20}$

Answer: (D) $\frac{1}{20}$ · Key from source paper

Q111 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Five numbers x_1, x_2, x_3, x_4, x_5 are randomly selected from the numbers $1, 2, 3, \ldots\ldots, 18$ and are arranged in the increasing order ($x_1 < x_2 < x_3 < x_4 < x_5$). The probability that $x_2 = 7$ and $x_4 = 11$ is

(A) $\frac{1}{136}$
(B) $\frac{1}{68}$
(C) $\frac{7}{68}$
(D) $\frac{5}{68}$

Answer: (B) $\frac{1}{68}$ · Key from source paper

Q112 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Let X be a random variable having binomial distribution $B(7, p)$. If $P(X = 3) = 5P(X = 4)$, then the sum of the mean and the variance of X is

(A) $\frac{105}{16}$
(B) $\frac{77}{36}$
(C) $\frac{31}{36}$
(D) $\frac{35}{36}$

Answer: (B) $\frac{77}{36}$ · Key from source paper

Q113 JEE Main 2022 · 27 Jun · Shift 2 MCQ

If a point $A(x, y)$ lies in the region bounded by the y-axis, straight lines $2y + x = 6$ and $5x - 6y = 30$, then the probability that $y < 1$ is

(A) $\frac{1}{6}$
(B) $\frac{5}{6}$
(C) $\frac{2}{3}$
(D) $\frac{6}{7}$

Answer: (B) $\frac{5}{6}$ · Key from source paper

Q114 JEE Main 2022 · 27 Jun · Shift 2 Numerical

Let $S = \{E, E_2 \ldots E_8\}$ be a sample space of raddom experiment such that $P(E_n) = \frac{n}{36}$ for every $n = 1, 2 \ldots .8$. Then the number of elements in the set $\{A \subset S : P(A) \geq \frac{4}{5}\}$ is _____ .

Numerical value type: the answer is a number.

Answer: 19. · Key from source paper

Q115 JEE Main 2022 · 26 Jun · Shift 1 MCQ

Let a biased coin be tossed 5 times. If the probability of getting 4 heads is equal to the probability of getting 5 heads, then the probability of getting atmost two heads is

(A) $\frac{46}{6^4}$
(B) $\frac{275}{6^5}$
(C) $\frac{41}{5^5}$
(D) $\frac{36}{5^4}$

Answer: (A) $\frac{46}{6^4}$ · Key from source paper

Q116 JEE Main 2022 · 26 Jun · Shift 2 Numerical

If the probability that a randomly chosen 6-digit number formed by using digits 1 and 8 only is a multiple of 21 is p, then $96p$ is equal to _____ .

Numerical value type: the answer is a number.

Answer: 33. · Key from source paper

Q117 JEE Main 2022 · 25 Jun · Shift 1 MCQ

Let E_1 and E_2 be two events such that the conditional probabilities $PE_1 \mid E_2 = \frac{1}{2}$, $PE_2 \mid E_1 = \frac{3}{4}$ and $PE_1 \cap E_2 = \frac{1}{8}$. Then

(A) $PE_1 \cap E_2 = PE_1 \cdot PE_2$

(B) $PE_1' \cap E_2' = PE_1' \cdot PE_2$

(C) $PE_1 \cap E_2' = PE_1 \cdot PE_2$

(D) $PE_1 \cup E_2 = PE_1 PE_2$

Answer: (C) $PE_1 \cap E_2' = PE_1 \cdot PE_2$ · Key from source paper

Q118 JEE Main 2022 · 25 Jun · Shift 2 MCQ

A biased die is marked with numbers $2, 4, 8, 16, 32, 32$ on its faces and the probability of getting a face with mark n is $\frac{1}{n}$. If the die is thrown thrice, then the probability, that the sum of the numbers obtained is 48, is

(A) $\frac{7}{2^{11}}$

(B) $\frac{7}{2^{12}}$

(C) $\frac{3}{2^{10}}$

(D) $\frac{13}{2^{12}}$

Answer: (D) $\frac{13}{2^{12}}$ · Key from source paper

Q119 JEE Main 2022 · 24 Jun · Shift 1 MCQ

Bag A contains 2 white, 1 black and 3 red balls and bag B contains 3 black, 2 red and n white balls. One bag is chosen at random and 2 balls drawn from it at random are found to be 1 red and 1 black. If the probability that both balls come from Bag A is $\frac{6}{11}$, then n is equal to _____

(A) 13

(B) 6

(C) 4

(D) 3

Answer: (C) 4 · Key from source paper

Q120 JEE Main 2022 · 24 Jun · Shift 1 MCQ

If a random variable X follows the Binomial distribution $B(33, p)$ such that $3P(X = 0) = P(X = 1)$, then the value of $\frac{P(X=15)}{P(X=18)} - \frac{P(X=16)}{P(X=17)}$ is equal to

(A) 1320

(B) 1088

(C) $\frac{1088}{1089}$

(D) $\frac{120}{1331}$

Answer: (A) 1320 · Key from source paper

Q121 JEE Main 2022 · 24 Jun · Shift 2 MCQ

A random variable X has the following probability distribution:

X	0	1	2	3	4
$P(X)$	k	$2k$	$4k$	$6k$	$8k$

The value of $P\left(\frac{1<x<4}{x\leq 2}\right)$ is equal to

(A) $\frac{4}{7}$

(B) $\frac{2}{3}$

(C) $\frac{3}{7}$

(D) $\frac{4}{5}$

Answer: (A) $\frac{4}{7}$ · Key from source paper

Q122 JEE Main 2022 · 24 Jun · Shift 2 Numerical

In an examination, there are 10 true-false type questions. Out of 10, a student can guess the answer of 4 questions correctly with probability $\frac{3}{4}$ and the remaining 6 questions correctly with probability $\frac{1}{4}$. If the probability that the student guesses the answers of exactly 8 questions correctly out of 10 is $\frac{27k}{4^{10}}$, then k is equal to

Numerical value type: the answer is a number.

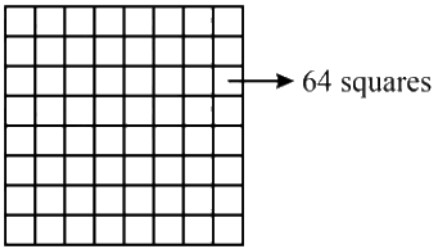
Answer: 479. · Key from source paper

Q123 JEE Main 2021 · 1 Sep · Shift 2 MCQ

Two squares are chosen at random on a chessboard (see figure). The probability that they have a side in common is :

(see the figure above)

Q80. Two squares are chosen at random on a chessboard (see figure). The probability that they have a side in common is :



(1) $\frac{1}{9}$
(2) $\frac{1}{7}$
(3) $\frac{2}{7}$
(4) $\frac{1}{18}$

A $\frac{1}{9}$
B $\frac{1}{7}$
C $\frac{2}{7}$
D $\frac{1}{18}$

Answer: (D) $\frac{1}{18}$ · Key from source paper

Q124 JEE Main 2021 · 1 Sep · Shift 2 Numerical

Let X be a random variable with distribution.
x: -2, -1, 3, 4, 6
$P(X = x)$: $\frac{1}{5}$, a, $\frac{1}{3}$, $\frac{1}{5}$, b
If the mean of X is 2.3 and variance of X is σ^2, then $100\sigma^2$ is equal to :

Numerical value type: the answer is a number.

Answer: 781. · Key from source paper

Q125 JEE Main 2021 · 31 Aug · Shift 1 Numerical

An electric instrument consists of two units. Each unit must function independently for the instrument to operate. The probability that the first unit functions is 0.9 and that of the second unit is 0.8. The instrument is switched on and it fails to operate. If the probability that only the first unit failed and second unit is functioning is p, then $98p$ is equal to

Numerical value type: the answer is a number.

Answer: 28. · Key from source paper

Q126 JEE Main 2021 · 31 Aug · Shift 2 MCQ

Let $S = \{1, 2, 3, 4, 5, 6\}$. Then the probability that a randomly chosen onto function g from S to S satisfies $g3 = 2\ g1$ is :

(A) $\frac{1}{15}$
(B) $\frac{1}{5}$
(C) $\frac{1}{30}$
(D) $\frac{1}{10}$

Answer: (D) $\frac{1}{10}$ · Key from source paper

Q127 JEE Main 2021 · 27 Aug · Shift 1 MCQ

When a certain biased die is rolled, a particular face occurs with probability $\frac{1}{6} - x$ and its opposite face occurs with probability $\frac{1}{6} + x$. All other faces occur with probability $\frac{1}{6}$.
Note that opposite faces sum to 7 in any die. If $0 < x < \frac{1}{6}$, and the probability of obtaining total sum $= 7$, when such a die is rolled twice, is $\frac{13}{96}$, then the value of x is

(A) $\frac{1}{16}$
(B) $\frac{1}{12}$
(C) $\frac{1}{8}$
(D) $\frac{1}{9}$

Answer: (C) $\frac{1}{8}$ · Key from source paper

Q128 JEE Main 2021 · 27 Aug · Shift 2 MCQ

Each of the persons A and B independently tosses three fair coins. The probability that both of them get the same number of heads is:

(A) $\frac{5}{8}$
(B) $\frac{1}{8}$
(C) $\frac{5}{16}$
(D) 1

Answer: (C) $\frac{5}{16}$ · Key from source paper

Q129 JEE Main 2021 · 27 Aug · Shift 2 Numerical

The probability distribution of random variable X is given by:
Table with two rows: X takes the values $1, 2, 3, 4, 5$ and $P(X)$ takes the values $K, 2K, 2K, 3K, K$ respectively.
Let $p = P(1 < X < 4 \mid X < 3)$. If $5p = \lambda K$, then λ is equal to

Numerical value type: the answer is a number.

Answer: 30. · Key from source paper

Q130 JEE Main 2021 · 26 Aug · Shift 1 MCQ

Let A and B be independent events such that $\mathrm{P(A)} = \mathrm{p}, \mathrm{P(B)} = 2\mathrm{p}$. The largest value of p, for which P (exactly one of A, B occurs)$= \frac{5}{9}$, is:

(A) $\frac{4}{9}$
(B) $\frac{1}{5}$
(C) $\frac{5}{12}$
(D) $\frac{2}{9}$

Answer: (C) $\frac{5}{12}$ · Key from source paper

Q131 JEE Main 2021 · 26 Aug · Shift 2 MCQ

A fair die is tossed until six is obtained on it. Let X be the number of required tosses, then the conditional probability $P(X \geq 5 \mid X > 2)$ is :

(A) $\frac{25}{36}$
(B) $\frac{5}{6}$
(C) $\frac{11}{36}$
(D) $\frac{125}{216}$

Answer: (A) $\frac{25}{36}$ · Key from source paper

Q132 JEE Main 2021 · 27 Jul · Shift 1 MCQ

The probability that a randomly selected $2-$digit number belongs to the set $\{n \in N : (2^n - 2)$ is a multiple of $3\}$ is equal to

(A) $\frac{1}{6}$
(B) $\frac{2}{3}$
(C) $\frac{1}{2}$
(D) $\frac{1}{3}$

Answer: (C) $\frac{1}{2}$ · Key from source paper

Q133 JEE Main 2021 · 27 Jul · Shift 2 MCQ

A student appeared in an examination consisting of 8 true-false type questions. The student guesses the answers with equal probability. The smallest value of n, so that the probability of guessing at least n correct answers is less than $\frac{1}{2}$, is :

(A) 5
(B) 6
(C) 3
(D) 4

Answer: (A) 5 · Key from source paper

Q134 JEE Main 2021 · 25 Jul · Shift 1 MCQ

Let 9 distinct balls be distributed among 4 boxes, B_1, B_2, B_3 and B_4. If the probability that B_3 contains exactly 3 balls is $k\left(\frac{3}{4}\right)^9$ then k lies in the set :

(A) $\{x \in R : |x-3| < 1\}$
(B) $\{x \in R : |x-2| \leq 1\}$
(C) $\{x \in R : |x-1| < 1\}$
(D) $\{x \in R : |x-5| \leq 1\}$

Answer: (A) $\{x \in R : |x-3| < 1\}$ · Key from source paper

Q135 JEE Main 2021 · 25 Jul · Shift 2 MCQ

Let X be a random variable such that the probability function of a distribution is given by $P(X = 0) = \frac{1}{2}, P(X = j) = \frac{1}{3^j}$ $(j = 1, 2, 3, \ldots, \infty)$. Then the mean of the distribution and $P(X$ is positive and even) respectively, are:

(A) $\frac{3}{8}$ and $\frac{1}{8}$
(B) $\frac{3}{4}$ and $\frac{1}{8}$
(C) $\frac{3}{4}$ and $\frac{1}{9}$
(D) $\frac{3}{4}$ and $\frac{1}{16}$

Answer: (B) $\frac{3}{4}$ and $\frac{1}{8}$ · Key from source paper

Q136 JEE Main 2021 · 25 Jul · Shift 2 Numerical

A fair coin is tossed $n-$ times such that the probability of getting at least one head is at least 0.9. Then the minimum value of n is _____.

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q137 JEE Main 2021 · 22 Jul · Shift 1 MCQ

Four dice are thrown simultaneously and the numbers shown on these dice are recorded in 2×2 matrices. The probability that such formed matrices have all different entries and are non-singular, is:

(A) $\frac{45}{162}$
(B) $\frac{23}{81}$
(C) $\frac{22}{81}$
(D) $\frac{43}{162}$

Answer: (D) $\frac{43}{162}$ · Key from source paper

Q138 JEE Main 2021 · 20 Jul · Shift 1 MCQ

Words with or without meaning are to be formed using all the letters of the word EXAMINATION. The probability that the letter M appears at the fourth position in any such word is:

(A) $\frac{1}{66}$
(B) $\frac{1}{11}$
(C) $\frac{1}{9}$
(D) $\frac{2}{11}$

Answer: (B) $\frac{1}{11}$ · Key from source paper

Q139 JEE Main 2021 · 20 Jul · Shift 2 MCQ

Let A, B and C be three events such that the probability that exactly one of A and B occurs is $(1-k)$, the probability that exactly one of B and C occurs is $(1-2k)$, the probability that exactly one of C and A occurs is $(1-k)$ and the probability of all A, B and C occur simultaneously is k^2, where $0 < k < 1$. Then the probability that at least one of A, B and C occur is:

(A) greater than $\frac{1}{8}$ but less than $\frac{1}{4}$
(B) greater than $\frac{1}{2}$
(C) greater than $\frac{1}{4}$ but less than $\frac{1}{2}$
(D) exactly equal to $\frac{1}{2}$

Answer: (B) greater than $\frac{1}{2}$ · Key from source paper

Q140 JEE Main 2021 · 18 Mar · Shift 2 MCQ

Let in a Binomial distribution, consisting of 5 independent trials, probabilities of exactly 1 and 2 successes be 0.4096 and 0.2048 respectively. Then the probability of getting exactly 3 successes is equal to :

(A) $\frac{32}{625}$
(B) $\frac{80}{243}$
(C) $\frac{40}{243}$
(D) $\frac{128}{625}$

Answer: (A) $\frac{32}{625}$ · Key from source paper

Q141 JEE Main 2021 · 17 Mar · Shift 1 MCQ

Two dices are rolled. If both dices have six faces numbered $1, 2, 3, 5, 7$ and 11 , then the probability that the sum of the numbers on the top faces is less than or equal to 8 is:

(A) $\frac{4}{9}$
(B) $\frac{17}{36}$
(C) $\frac{5}{12}$
(D) $\frac{1}{2}$

Answer: (B) $\frac{17}{36}$ · Key from source paper

Q142 JEE Main 2021 · 17 Mar · Shift 1 Numerical

Let there be three independent events E_1, E_2 and E_3. The probability that only E_1 occurs is α only E_2 occurs is β and only E_3 occurs is γ. Let 'p' denote the probability of none of events occurs that satisfies the equations $(\alpha - 2\beta)p = \alpha\beta$ and $(\beta - 3\gamma)p = 2\beta\gamma$. All the given probabilities are assumed to lie in the interval $(0, 1)$.
Then, $\frac{\text{Probability of occurrence of } E_1}{\text{Probability of occurrence of } E_3}$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q143 JEE Main 2021 · 16 Mar · Shift 1 MCQ

A pack of cards has one card missing. Two cards are drawn randomly and are found to be spades. The probability that the missing card is not a spade, is :

(A) $\frac{3}{4}$
(B) $\frac{52}{867}$
(C) $\frac{39}{50}$
(D) $\frac{22}{425}$

Answer: (C) $\frac{39}{50}$ · Key from source paper

Q144 JEE Main 2021 · 16 Mar · Shift 2 MCQ

Let A denote the event that a 6-digit integer formed by 0, 1, 2, 3, 4, 5, 6 without repetitions, be divisible by 3 . Then probability of event A is equal to :

(A) $\frac{9}{56}$
(B) $\frac{4}{9}$
(C) $\frac{3}{7}$
(D) $\frac{11}{27}$

Answer: (B) $\frac{4}{9}$ · Key from source paper

Q145 JEE Main 2021 · 26 Feb · Shift 1 MCQ

A fair coin is tossed a fixed number of times. If the probability of getting 7 heads is equal to probability of getting 9 heads, then the probability of getting 2 heads is

(A) $\frac{15}{2^{13}}$
(B) $\frac{15}{2^{14}}$
(C) $\frac{15}{2^{12}}$
(D) $\frac{15}{2^{8}}$

Answer: (A) $\frac{15}{2^{13}}$ · Key from source paper

Q146 JEE Main 2021 · 26 Feb · Shift 2 MCQ

A seven digit number is formed using digits $3, 3, 4, 4, 4, 5, 5$. The probability, that number so formed is divisible by 2, is

(A) $\frac{4}{7}$
(B) $\frac{3}{7}$
(C) $\frac{1}{7}$
(D) $\frac{6}{7}$

Answer: (B) $\frac{3}{7}$ · Key from source paper

Q147 JEE Main 2021 · 25 Feb · Shift 1 MCQ

The coefficients a, b and c of the quadratic equation, $ax^2 + bx + c = 0$ are obtained by throwing a dice three times. The probability that this equation has equal roots is:

(A) $\frac{1}{72}$
(B) $\frac{1}{36}$
(C) $\frac{1}{54}$
(D) $\frac{5}{216}$

Answer: (D) $\frac{5}{216}$ · Key from source paper

Q148 JEE Main 2021 · 25 Feb · Shift 1 MCQ

When a missile is fired from a ship, the probability that it is intercepted is $\frac{1}{3}$ and the probability that the missile hits the target, given that it is not intercepted, is $\frac{3}{4}$. If three missiles are fired independently from the ship, then the probability that all three hit the target, is:

(A) $\frac{3}{8}$
(B) $\frac{1}{27}$
(C) $\frac{1}{8}$
(D) $\frac{3}{4}$

Answer: (C) $\frac{1}{8}$ · Key from source paper

Q149 JEE Main 2021 · 25 Feb · Shift 2 MCQ

In a group of 400 people, 160 are smokers and non-vegetarian; 100 are smokers and vegetarian and the remaining 140 are non-smokers and vegetarian. Their chances of getting a particular chest disorder are $35\%, 20\%$ and 10% respectively. A person is chosen from the group at random and is found to be suffering from the chest disorder. The probability that the selected person is a smoker and non-vegetarian is :

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(A) $\frac{14}{45}$
(B) $\frac{7}{45}$
(C) $\frac{8}{45}$
(D) $\frac{28}{45}$

Answer: (D) $\frac{28}{45}$ · Key from source paper

Q150 JEE Main 2021 · 25 Feb · Shift 2 MCQ

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) $\frac{122}{297}$
(C) $\frac{97}{297}$
(D) $\frac{2}{9}$

Answer: (C) $\frac{97}{297}$ · Key from source paper

Q151 JEE Main 2021 · 24 Feb · Shift 1 MCQ

An ordinary dice is rolled for a certain number of times. If the probability of getting an odd number 2 times is equal to the probability of getting an even number 3 times, then the probability of getting an odd number for odd number of times is:

(A) $\frac{1}{32}$
(B) $\frac{5}{16}$
(C) $\frac{3}{16}$
(D) $\frac{1}{2}$

Answer: (D) $\frac{1}{2}$ · Key from source paper

Q152 JEE Main 2021 · 24 Feb · Shift 1 Numerical

Let $B_i\ i=1,2,3$ be three independent events in a sample space. The probability that only B_1 occur is α, only B_2 occurs is β and only B_3 occurs is γ. Let p be the probability that none of the events B_i occurs and these 4 probabilities satisfy the equations $\alpha-2\beta p=\alpha\beta$ and $\beta-3\gamma p=2\beta\gamma$ (All the probabilities are assumed to lie in the interval $0,1$ Then $\frac{PB_1}{PB_3}$ is equal to _____.

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q153 JEE Main 2021 · 24 Feb · Shift 2 MCQ

The probability that two randomly selected subsets of the set $\{1,2,3,4,5\}$ have exactly two elements in their intersection, is:

(A) $\frac{65}{2^8}$
(B) $\frac{65}{2^7}$
(C) $\frac{35}{2^7}$
(D) $\frac{135}{2^9}$

Answer: (D) $\frac{135}{2^9}$ · Key from source paper

Q154 JEE Main 2020 · 6 Sep · Shift 1 MCQ

Out of 11 consecutive natural number if three numbers are selected at random (without repetition), then the probability that they are in A.P. with positive common difference is :

(A) $\frac{15}{101}$
(B) $\frac{5}{101}$
(C) $\frac{5}{33}$
(D) $\frac{10}{99}$

Answer: (C) $\frac{5}{33}$ · Key from source paper

Q155 JEE Main 2020 · 6 Sep · Shift 2 MCQ

The probabilities of three events A, B and C are given P(A) = 0.6, P(B) = 0.4 and P(C) = 0.5. If P(A ∪ B) = 0.8, P(A ∩ C) = 0.3, P(A ∩ B ∩ C) = 0.2, P(B ∩ C) = β and P(A ∪ B ∪ C) = α, where $0.85 \leq \alpha \leq 0.95$, then β lies in the interval :

(A) $[0.35,\ 0.36]$
(B) $[0.25,\ 0.35]$
(C) $[0.20,\ 0.25]$
(D) $[0.36,\ 0.40]$

Answer: (B) $[0.25,\ 0.35]$ · Key from source paper

Q156 JEE Main 2020 · 5 Sep · Shift 1 Numerical

Four fair dice are thrown independently 27 times. Then the expected number of times, at least two dice show up a three or a five, is

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q157 JEE Main 2020 · 5 Sep · Shift 2 Numerical

In a bombing attack, there is 50% chance that a bomb will hit the target. At least two independent hits are required to destroy the target completely. Then the minimum number of bombs, that must be dropped to ensure that there is at least 99% chance of completely destroying the target, is _____

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q158 JEE Main 2020 · 4 Sep · Shift 1 Numerical

The probability of a man hitting a target is $\frac{1}{10}$. The least number of shots required, so that the probability of his hitting the target at least once is greater than $\frac{1}{4}$, is _____

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q159 JEE Main 2020 · 4 Sep · Shift 2 MCQ

In a game two players A and B take turns in throwing a pair of fair dice starting with player A and total of scores on the two dice, in each throw is noted. A wins the game if he throws a total of 6 before B throws a total of 7 and B wins the game if he throws a total of 7 before A throws a total of six. The game stops as soon as either of the players wins. The probability of A winning the game is :

(A) $\frac{5}{31}$
(B) $\frac{31}{61}$
(C) $\frac{5}{6}$
(D) $\frac{30}{61}$

Answer: (D) $\frac{30}{61}$ · Key from source paper

Q160 JEE Main 2020 · 3 Sep · Shift 1 MCQ

A die is thrown two times and the sum of the scores appearing on the die is observed to be a multiple of 4. Then the conditional probability that the score 4 has appeared at least once is

(A) $\frac{1}{4}$
(B) $\frac{1}{3}$
(C) $\frac{1}{8}$
(D) $\frac{1}{9}$

Answer: (D) $\frac{1}{9}$ · Key from source paper

Q161 JEE Main 2020 · 3 Sep · Shift 2 MCQ

The probability that a randomly chosen 5- digit number is made from exactly two digits is :

(A) $\frac{135}{10^4}$
(B) $\frac{150}{10^4}$
(C) $\frac{134}{10^4}$
(D) $\frac{121}{10^4}$

Answer: (A) $\frac{135}{10^4}$ · Key from source paper

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Q162 JEE Main 2020 · 2 Sep · Shift 1 MCQ

Box 1 contains 30 cards numbered 1 to 30 and Box 2 contains 20 cards numbered 31 to 50. A box is selected at random and a card is drawn from it. The number on the card is found to be a non-prime number. The probability that the card was drawn from Box 1 is

(A) $\frac{2}{3}$
(B) $\frac{8}{17}$
(C) $\frac{4}{17}$
(D) $\frac{2}{5}$

Answer: (B) $\frac{8}{17}$ · Key from source paper

Q163 JEE Main 2020 · 2 Sep · Shift 2 MCQ

Let E^C denote the complement of an event E. Let E_1, E_2 and E_3 be any pairwise independent events with $P(E_1) > 0$ and $P(E_1 \cap E_2 \cap E_3) = 0$ then $P\left(\left(E_2^C \cap E_3^C\right)/E_1\right)$ is equal to

(A) $P\left(E_2^C\right) + P(E_3)$
(B) $P\left(E_3^C\right) - P\left(E_2^C\right)$
(C) $P(E_3) - P\left(E_2^C\right)$
(D) $P\left(E_3^C\right) - P(E_2)$

Answer: (D) $P\left(E_3^C\right) - P(E_2)$ · Key from source paper

Q164 JEE Main 2020 · 9 Jan · Shift 1 MCQ

In a box, there are 20 cards, out of which 10 are labelled as A and the remaining 10 are labelled as B. Cards are drawn at random, one after the other and with replacement, till a second A card is obtained. The probability that the second A card appears before the third B card is:

(A) $\frac{9}{16}$
(B) $\frac{11}{16}$
(C) $\frac{13}{16}$
(D) $\frac{15}{16}$

Answer: (B) $\frac{11}{16}$ · Key from source paper

Q165 JEE Main 2020 · 9 Jan · Shift 2 MCQ

A random variable X has the following probability distribution:
X: 1 2 3 4 5
$P(X)$: k^2 $2k$ k $2k$ $5k^2$
Then, $P(X > 2)$ is equal to:

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(A) $\frac{7}{12}$
(B) $\frac{1}{36}$
(C) $\frac{1}{6}$
(D) $\frac{23}{36}$

Answer: (D) $\frac{23}{36}$ · Key from source paper

Q166 JEE Main 2020 · 8 Jan · Shift 1 MCQ

Let A and B be two independent events such that $P(A) = \frac{1}{3}$ and $P(B) = \frac{1}{6}$. Then, which of the following is true?

(A) $P\left(\frac{A}{B}\right) = \frac{2}{3}$
(B) $P\left(\frac{A}{B'}\right) = \frac{1}{3}$
(C) $P\left(\frac{A'}{B'}\right) = \frac{1}{3}$
(D) $P\left(\frac{A}{(A \cup B)}\right) = \frac{1}{4}$

Answer: (B) $P\left(\frac{A}{B'}\right) = \frac{1}{3}$ · Key from source paper

Q167 JEE Main 2020 · 8 Jan · Shift 2 MCQ

Let A and B, be two events such that the probability that exactly one of them occurs is $\frac{2}{5}$, and the probability that A or B, occurs is $\frac{1}{2}$, then the probability of both of them occur together is.

(A) 0.02
(B) 0.20
(C) 0.01
(D) 0.10

Answer: (D) 0.10 · Key from source paper

Q168 JEE Main 2020 · 7 Jan · Shift 1 MCQ

An unbiased coin is tossed 5 times. Suppose that a variable X is assigned the value k when k consecutive heads are obtained for $k = 3, 4, 5$, otherwise X takes the value -1. Then the expected value of X, is

(A) $\frac{3}{16}$
(B) $\frac{1}{8}$
(C) $-\frac{3}{16}$
(D) $-\frac{1}{8}$

Answer: (B) $\frac{1}{8}$ · Key from source paper

Q169 JEE Main 2020 · 7 Jan · Shift 2 MCQ

In a workshop, there are five machines and the probability of any one of them to be out of service on a day is $\frac{1}{4}$. If the probability that at most two machines will be out of service on the same day is $\left(\frac{3}{4}\right)^3 k$, then k is equal to

(A) $\frac{17}{8}$
(B) $\frac{17}{4}$
(C) $\frac{17}{2}$
(D) 4

Answer: (A) $\frac{17}{8}$ · Key from source paper

Q170 JEE Main 2019 · 12 Apr · Shift 1 MCQ

If three of the six vertices of a regular hexagon are chosen at random, then the probability that the triangle formed with these chosen vertices is equilateral is:

(A) $\frac{1}{10}$
(B) $\frac{3}{10}$
(C) $\frac{1}{5}$
(D) $\frac{3}{20}$

Answer: (A) $\frac{1}{10}$ · Key from source paper

Q171 JEE Main 2019 · 12 Apr · Shift 1 MCQ

Let a random variable X has a binomial distribution with mean 8 and variance 4. If $PX \leq 2 = \frac{k}{2^{16}}$, then the value of k is equal to

(A) 121
(B) 1
(C) 17
(D) 137

Answer: (D) 137 · Key from source paper

Q172 JEE Main 2019 · 12 Apr · Shift 2 MCQ

A person throws two fair dice. He wins Rs. 15 for throwing a doublet (same numbers on the two dice), wins Rs 12 when the throw results in the sum of 9 , and loses Rs. 6 for any other outcome on the throw. Then the expected gain/loss (in Rs.) of the person is:

EdLoop JEE

(A) $\frac{1}{2}$ loss
(B) $\frac{1}{2}$ gain
(C) 2 gain
(D) $\frac{1}{4}$ loss

Answer: (A) $\frac{1}{2}$ loss · Key from source paper

Q173 JEE Main 2019 · 12 Apr · Shift 2 MCQ

For an initial screening of an admission test, a candidate is given fifty problems to solve. If the probability that the candidate can solve any problem is $\frac{4}{5}$, then the probability that he is unable to solve less than two problems is

(A) $\frac{201}{5}\left(\frac{1}{5}\right)^{49}$
(B) $\frac{164}{25}\left(\frac{1}{5}\right)^{48}$
(C) $\frac{316}{25}\left(\frac{4}{5}\right)^{48}$
(D) $\frac{54}{5}\left(\frac{4}{5}\right)^{49}$

Answer: (D) $\frac{54}{5}\left(\frac{4}{5}\right)^{49}$ · Key from source paper

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Q174 JEE Main 2019 · 10 Apr · Shift 1 MCQ

Assume that each born child is equally likely to be a boy or girl. If two families have two children each, then the conditional probability that all children are girls given that at least two are girls is:

(A) $\frac{1}{12}$
(B) $\frac{1}{10}$
(C) $\frac{1}{11}$
(D) $\frac{1}{17}$

Answer: (C) $\frac{1}{11}$ · Key from source paper

Q175 JEE Main 2019 · 10 Apr · Shift 2 MCQ

Minimum number of times a fair coin must be tossed so that the probability of getting at least one head is more than 99% is:

(A) 8
(B) 6
(C) 5
(D) 7

Answer: (D) 7 · Key from source paper

Q176 JEE Main 2019 · 9 Apr · Shift 1 MCQ

Four persons can hit a target correctly with probabilities $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ and $\frac{1}{8}$ respectively. If all hit at the target independently, then the probability that the target would be hit, is

(A) $\frac{25}{192}$
(B) $\frac{7}{32}$
(C) $\frac{1}{192}$
(D) $\frac{25}{32}$

Answer: (D) $\frac{25}{32}$ · Key from source paper

Q177 JEE Main 2019 · 9 Apr · Shift 2 MCQ

Two newspapers A and B are published in a city. It is known that 25% of the city population reads A and 20% reads B while 8% reads both A and B. Further, 30% of those who read A but not B look into advertisements and 40% of those who read B but not A also look into advertisements, while 50% of those who read both A and B look into advertisements. Then the percentage of the population who look into advertisements is:

(A) 13.5
(B) 12.8
(C) 13.9
(D) 13

Answer: (C) 13.9 · Key from source paper

Q178 JEE Main 2019 · 8 Apr · Shift 1 MCQ

Let A and B be two non-null events such that $A \subset B$. Then, which of the following statements is always correct?

(A) $PA \mid B \geq P(A)$
(B) $PA \mid B = PB - PA$
(C) $PA \mid B \leq P(A)$
(D) $PA \mid B = 1$

Answer: (A) $PA \mid B \geq P(A)$ · Key from source paper

Q179 JEE Main 2019 · 8 Apr · Shift 2 MCQ

The minimum number of times one has to toss a fair coin so that the probability of observing at least one head is at least 90% is:

(A) 2
(B) 4
(C) 5
(D) 3

Answer: (B) 4 · Key from source paper

Q180 JEE Main 2019 · 12 Jan · Shift 1 MCQ

In a random experiment, a fair die is rolled until two fours are obtained in succession. The probability that the experiment will end in the fifth throw of the die is equal to :

(A) $\frac{150}{6^5}$
(B) $\frac{175}{6^5}$
(C) $\frac{225}{6^5}$
(D) $\frac{200}{6^5}$

Answer: (B) $\frac{175}{6^5}$ · Key from source paper

Q181 JEE Main 2019 · 12 Jan · Shift 2 MCQ

In a class of 60 students, 40 opted for NCC, 30 opted for NSS and 20 opted for both NCC and NSS. If one of these students is selected at random, then the probability that the student selected has opted neither for NCC nor for NSS is :

(A) $\frac{1}{6}$
(B) $\frac{5}{6}$
(C) $\frac{1}{3}$
(D) $\frac{2}{3}$

Answer: (A) $\frac{1}{6}$ · Key from source paper

Q182 JEE Main 2019 · 12 Jan · Shift 2 MCQ

In a game, a man wins Rs. 100 if he gets 5 or 6 on a throw of a fair die and loses Rs. 50 for getting any other number on the die. If he decides to throw the die either till he gets a five or a six or to a maximum of three throws, then his expected gain/loss (in rupees) is :

(A) $\frac{400}{3}$ gain
(B) $\frac{400}{9}$ gain
(C) $\frac{400}{3}$ loss
(D) 0

Answer: (D) 0 · Key from source paper

Q183 JEE Main 2019 · 11 Jan · Shift 1 MCQ

Two integers are selected at random from the set $\{1, 2, ..., 11\}$. Given that the sum of selected numbers is even, the conditional probability that both the numbers are even is :

(A) $\frac{7}{10}$
(B) $\frac{1}{2}$
(C) $\frac{2}{5}$
(D) $\frac{3}{5}$

Answer: (C) $\frac{2}{5}$ · Key from source paper

Q184 JEE Main 2019 · 11 Jan · Shift 2 MCQ

Let S = $\{1, 2, ..., 20\}$. A subset B of S is said to be "nice", if the sum of the elements of B is 203 . Than the probability that a randomly chosen subset of S is "nice" is :

(A) $\frac{7}{2^{20}}$
(B) $\frac{5}{2^{20}}$
(C) $\frac{4}{2^{20}}$
(D) None of the above

Answer: (B) $\frac{5}{2^{20}}$ · Key from source paper

Q185 JEE Main 2019 · 11 Jan · Shift 2 MCQ

A bag contains 30 white balls and 10 red balls. 16 balls are drawn one by one randomly from the bag with replacement. If X be the number of white balls drawn, then $\left(\frac{\text{mean of X}}{\text{standard deviation of X}}\right)$ is equal to:

(A) 4
(B) $4\sqrt{3}$
(C) $3\sqrt{2}$
(D) $\frac{4\sqrt{3}}{3}$

Answer: (B) $4\sqrt{3}$ · Key from source paper

Q186 JEE Main 2019 · 10 Jan · Shift 1 MCQ

An unbiased coin is tossed. If the outcome is a head then a pair of unbiased dice is rolled and the sum of the numbers obtained on them is noted. If the toss of the coin results in tail then a card from a well-shuffled pack of nine cards numbered 1, 2, 3,..., 9 is randomly picked and the number on the card is noted. The probability that the noted number is either 7 or 8 is

(A) $\frac{13}{36}$
(B) $\frac{19}{72}$
(C) $\frac{15}{72}$
(D) $\frac{19}{36}$

Answer: (B) $\frac{19}{72}$ · Key from source paper

Q187 JEE Main 2019 · 10 Jan · Shift 2 MCQ

If the probability of hitting a target by a shooter, in any shot is $\frac{1}{3}$, then the minimum number of independent shots at the target required by him so that the probability of hitting the target at least once is greater than $\frac{5}{6}$, is:

(A) 4
(B) 5
(C) 6
(D) 3

Answer: (B) 5 · Key from source paper

Q188 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Two cards are drawn successively with replacement from a well-shuffled deck of 52 cards. Let X denote the random variable of number of aces obtained in the two drawn cards. Then $PX = 1 + PX = 2$ equals:

(A) $\frac{24}{169}$
(B) $\frac{52}{169}$
(C) $\frac{49}{169}$
(D) $\frac{25}{169}$

Answer: (D) $\frac{25}{169}$ · Key from source paper

Q189 JEE Main 2019 · 9 Jan · Shift 2 MCQ

An urn contains 5 red and 2 green balls. A ball is drawn at random from the urn. If the drawn ball is green, then a red ball is added to the urn and if the drawn ball is red, then a green ball is added to the urn; the original ball is not returned to the urn. Now, a second ball is drawn at random from it. The probability that the second ball is red, is:

EdLoop JEE

(A) $\frac{21}{49}$
(B) $\frac{26}{49}$
(C) $\frac{32}{49}$
(D) $\frac{27}{49}$

Answer: (C) $\frac{32}{49}$ · Key from source paper

Q190 JEE Main 2018 · 16 Apr · Online MCQ

Two different families A and B are blessed with equal number of children. There are 3 tickets to be distributed amongst the children of these families so that no child gets more than one ticket. If the probability that all the tickets go to the children of the family B is $\frac{1}{12}$, then the number of children in each family is

(A) 6
(B) 5
(C) 3
(D) 4

Answer: (B) 5 · Key from source paper

Q191 JEE Main 2018 · 16 Apr · Online MCQ

Let A, B and C be three events, which are pair-wise independent and E denotes the complement of an event E. If $P(A \cap B \cap C) = 0$ and $P(C) > 0$, then $P\left[\left(\overline{A} \cap \overline{B}\right)\middle|C\right]$ is equal to

(A) $P\left(\overline{A}\right) - P(B)$
(B) $P\left(\overline{A}\right) - P\left(\overline{B}\right)$
(C) $P\left(\overline{A}\right) + P\left(\overline{B}\right)$
(D) $P(A) + P\left(\overline{B}\right)$

Answer: (A) $P\left(\overline{A}\right) - P(B)$ · Key from source paper

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Q192 JEE Main 2018 · 15 Apr · Shift 1 MCQ

A box ' A ' contanis (sic) 2 white, 3 red and 2 black balls. Another box ' B' contains 4 white, 2 red and 3 black balls. If two balls are drawn at random, without replacement, from a randomly selected box and one ball turns out to be white while the other ball turns out to be red, then the probability that both balls are drawn from box ' B' is

EdLoop JEE

(A) $\frac{7}{16}$
(B) $\frac{9}{32}$
(C) $\frac{7}{8}$
(D) $\frac{9}{16}$

Answer: (A) $\frac{7}{16}$ · Key from source paper

Q193 JEE Main 2018 · 15 Apr · Shift 2 MCQ

A player X has a biased coin whose probability of showing heads is p and a player Y has a fair coin. They start playing a game with their own coins and play alternately. The player who throws a head first is a winner. If X starts the game, and the probability of winning the game by both the players is equal, then the value of ' p ' is

(A) $\frac{1}{3}$
(B) $\frac{1}{5}$
(C) $\frac{1}{4}$
(D) $\frac{2}{5}$

Answer: (A) $\frac{1}{3}$ · Key from source paper

Q194 JEE Main 2018 · 8 Apr · Offline MCQ

A bag contains 4 red and 6 black balls. A ball is drawn at random from the bag, its color is observed and this ball along with two additional balls of the same color are returned to the bag. If now a ball is drawn at random from the bag, then the probability that this drawn ball is red, is:

(A) $\frac{3}{4}$
(B) $\frac{3}{10}$
(C) $\frac{2}{5}$
(D) $\frac{1}{5}$

Answer: (C) $\frac{2}{5}$ · Key from source paper

Q195 JEE Main 2017 · 9 Apr · Online MCQ

From a group of 10 men and 5 women, four member committees are to be formed each of which must contain at least one women. Then the probability for these committees to have more women than men, is :

(A) $\frac{3}{11}$
(B) $\frac{2}{23}$
(C) $\frac{1}{11}$
(D) $\frac{21}{220}$

Answer: (C) $\frac{1}{11}$ · Key from source paper

Q196 JEE Main 2017 · 9 Apr · Online MCQ

Let E & F be two independent events. The probability that E & F happen is $\frac{1}{12}$ and the probability that neither E nor F happens is $\frac{1}{2}$, then a value of $\frac{P(E)}{P(F)}$ is:

(A) $\frac{4}{3}$
(B) $\frac{1}{3}$
(C) $\frac{3}{2}$
(D) $\frac{5}{12}$

Answer: (A) $\frac{4}{3}$ · Key from source paper

Q197 JEE Main 2017 · 8 Apr · Online MCQ

An unbiased coin is tossed eight times. The probability of obtaining at least one head and at least one tail is:

(A) $\frac{127}{128}$
(B) $\frac{63}{64}$
(C) $\frac{255}{256}$
(D) $\frac{1}{2}$

Answer: (A) $\frac{127}{128}$ · Key from source paper

Q198 JEE Main 2017 · 8 Apr · Online MCQ

Three persons P, Q and R independently try to hit a target. If the probabilities of their hitting the target are $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{5}{8}$ respectively, then the probability that the target is hit by P or Q but not by R is:

(A) $\frac{39}{64}$
(B) $\frac{21}{64}$
(C) $\frac{9}{64}$
(D) $\frac{15}{64}$

Answer: (B) $\frac{21}{64}$ · Key from source paper

Q199 JEE Main 2017 · 2 Apr · Offline MCQ

A box contains 15 green and 10 yellow balls. If 10 balls are randomly drawn, one-by-one, with replacement, then the variance of the number of green balls drawn is:

(A) $\frac{12}{5}$
(B) 6
(C) 4
(D) $\frac{6}{25}$

Answer: (A) $\frac{12}{5}$ · Key from source paper

Q200 JEE Main 2017 · 2 Apr · Offline MCQ

For three events, A, B and C, P(Exactly one of A or B occurs)
$= P$(Exactly one of B or C occurs)
$= P$(Exactly one of C or A occurs) $= \frac{1}{4}$ and P(All the three events occur simultaneously) $= \frac{1}{16}$.
Then the probability that at least one of the events occurs, is:

(A) $\frac{7}{32}$
(B) $\frac{7}{16}$
(C) $\frac{7}{64}$
(D) $\frac{3}{16}$

Answer: (B) $\frac{7}{16}$ · Key from source paper

Q201 JEE Main 2017 · 2 Apr · Offline MCQ

If two different numbers are taken from the set $\{0, 1, 2, 3, \ldots\ldots, 10\}$; then the probability that their sum as well as absolute difference are both multiple of 4, is:

(A) $\frac{6}{55}$
(B) $\frac{12}{55}$
(C) $\frac{14}{45}$
(D) $\frac{7}{55}$

Answer: (A) $\frac{6}{55}$ · Key from source paper

Q202 JEE Main 2016 · 10 Apr · Online MCQ

An experiment succeeds twice as often as it fails. The probability of at least 5 successes in the six trials of this experiment is

(A) $\frac{496}{729}$
(B) $\frac{192}{729}$
(C) $\frac{240}{729}$
(D) $\frac{256}{729}$

Answer: (D) $\frac{256}{729}$ · Key from source paper

Q203 JEE Main 2016 · 9 Apr · Online MCQ

If A and B are any two events such that $P(A) = \frac{2}{5}$ and $P(A \cap B) = \frac{3}{20}$, then the conditional probability, $P(A|(A' \cup B'))$, where A' denotes the complement of A, is equal to :

(A) $\frac{11}{20}$
(B) $\frac{5}{17}$
(C) $\frac{8}{17}$
(D) $\frac{1}{4}$

Answer: (B) $\frac{5}{17}$ · Key from source paper

Q204 JEE Main 2016 · 3 Apr · Offline MCQ

Let two fair six-faced dice A and B be thrown simultaneously. If E_1 is the event that die A shows up four, E_2 is the event that die B shows up two and E_3 is the event that the sum of numbers on both dice is odd, then which of the following statements is not true?

(A) E_1 and E_3 are independent
(B) E_1, E_2 and E_3 are independent
(C) E_1 and E_2 are independent
(D) E_2 and E_3 are independent

Answer: (B) E_1, E_2 and E_3 are independent · Key from source paper

Q205 JEE Main 2015 · 11 Apr · Online MCQ

If the mean and the variance of a binomial variate X are 2 & 1 respectively, then the probability that X takes a value greater than or equal to one is:

(A) $\frac{1}{16}$
(B) $\frac{9}{16}$
(C) $\frac{3}{4}$
(D) $\frac{15}{16}$

Answer: (D) $\frac{15}{16}$ · Key from source paper

Q206 JEE Main 2015 · 11 Apr · Online MCQ

If the lengths of the sides of a triangle are decided by the three throws of a single fair die, then the probability that the triangle is of maximum area given that it is an isosceles triangle, is:

(A) $\frac{1}{69}$
(B) $\frac{1}{26}$
(C) $\frac{1}{21}$
(D) $\frac{1}{15}$

Answer: (A) $\frac{1}{69}$ · Key from source paper

Q207 JEE Main 2015 · 10 Apr · Online MCQ

Let X be a set containing 10 elements and P(X) be its power set. If A and B are picked up at random from P(X), with replacement, then the probability that A and B have equal number of elements is:

(A) $\frac{(2^{10}-1)}{2^{20}}$
(B) $\frac{{}^{20}C_{10}}{2^{20}}$
(C) $\frac{{}^{20}C_{10}}{2^{10}}$
(D) $\frac{(2^{10}-1)}{2^{10}}$

Answer: (B) $\frac{{}^{20}C_{10}}{2^{20}}$ · Key from source paper

Q208 JEE Main 2015 · 4 Apr · Offline MCQ

If 12 identical balls are to be placed in 3 identical boxes, then the probability that one of the boxes contains exactly 3 balls is

(A) $22\left(\frac{1}{3}\right)^{11}$
(B) $\frac{5}{19}$
(C) $55\left(\frac{2}{3}\right)^{10}$
(D) $220\left(\frac{1}{3}\right)^{12}$

Answer: (B) $\frac{5}{19}$ · Key from source paper

Q209 JEE Main 2014 · 19 Apr · Online MCQ

Let A and E be any two events with positive probabilities
Statement I: $P(E/A) \geq P(A/E)P(E)$.
Statement II: $P(A/E) \geq P(A \cap E)$.

(A) Both the statements are false
(B) Both the statements are true
(C) Statement - **I** is false, Statement - **II** is true
(D) Statement - **I** is true, Statement - **II** is false

Answer: (B) Both the statements are true · Key from source paper

Q210 JEE Main 2014 · 12 Apr · Online MCQ

A number x is chosen at random from the set $\{1, 2, 3, 4, \ldots\ldots, 100\}$. Define the event: A = the chosen number x satisfies $\frac{(x-10)(x-50)}{(x-30)} \geq 0$ Then P(A) is:

(A) 0.71
(B) 0.70
(C) 0.51
(D) 0.20

Answer: (A) 0.71 · Key from source paper

Q211 JEE Main 2014 · 11 Apr · Online MCQ

A set S contains 7 elements. A non-empty subset A of S and an element x of S are chosen at random. Then the probability that $\mathrm{x} \in A$ is:

(A) $\frac{1}{2}$
(B) $\frac{64}{127}$
(C) $\frac{63}{128}$
(D) $\frac{31}{128}$

Answer: (B) $\frac{64}{127}$ · Key from source paper

Q212 JEE Main 2014 · 11 Apr · Online MCQ

If X has a binomial distribution, $B(n, p)$ with parameters n and p such that $P(X = 2) = P(X = 3)$, then $\mathrm{E(X)}$, the mean of variable X, is

(A) $2 - \mathrm{p}$
(B) $3 - p$
(C) $\frac{p}{2}$
(D) $\frac{p}{3}$

Answer: (B) $3 - p$ · Key from source paper

Q213 JEE Main 2014 · 9 Apr · Online MCQ

If $A$and B are two events such that $P(A \cup B) = P(A \cap B)$, then the incorrect statement amongst the following statements is :

(A) $P(A) + P(B) = 1$
(B) $P(A \cap B') = 0$
(C) $A \,\&\, B$ are equally likely
(D) $P(A' \cap B) = 0$

Answer: (A) $P(A) + P(B) = 1$ · Key from source paper

Q214 JEE Main 2014 · 6 Apr · Offline MCQ

Let A and B be two events such that $P\left(\overline{A \cup B}\right) = \frac{1}{6}$, $P(A \cap B) = \frac{1}{4}$ and $P\left(\overline{A}\right) = \frac{1}{4}$, where $\overline{A}$ stands for the complement of the event A. Then the events A and B are

(A) Independent but not equally likely.
(B) Independent and equally likely.
(C) Mutually exclusive and independent.
(D) Equally likely but not independent.

Answer: (A) Independent but not equally likely. · Key from source paper

Q215 JEE Main 2013 · 25 Apr · Online MCQ

If the events A and B are mutually exclusive events such that P(A) = $\frac{3x+1}{3}$ and P(B) = $\frac{1-x}{4}$, then the set of possible values of x lies in the interval :

(A) $[0, 1]$
(B) $\left[\frac{1}{3}, \frac{2}{3}\right]$
(C) $\left[-\frac{1}{3}, \frac{5}{9}\right]$
(D) $\left[-\frac{7}{9}, \frac{4}{9}\right]$

Answer: (C) $\left[-\frac{1}{3}, \frac{5}{9}\right]$ · Key from source paper

Q216 JEE Main 2013 · 23 Apr · Online MCQ

A, B, C try to hit a target simultaneously but independently. Their respective probabilities of hitting the targets are $\frac{3}{4}, \frac{1}{2}, \frac{5}{8}$. The probability that the target is hit by A or B but not by C is :

(A) 21/64
(B) 7/8
(C) 7/32
(D) 9/64

Answer: (A) 21/64 · Key from source paper

Q217 JEE Main 2013 · 22 Apr · Online MCQ

Given two independent events, if the probability that exactly one of them occurs is $\frac{26}{49}$ and the probability that none of them occurs is $\frac{15}{49}$, then the probability of more probable of the two events is :

(A) 4/7
(B) 6/7
(C) 3/7
(D) 5/7

Answer: (A) 4/7 · Key from source paper

Q218 JEE Main 2013 · 9 Apr · Online MCQ

The probability of a man hitting a target is $\frac{2}{5}$. He fires at the target k times (k, a given number). Then the minimum k, so that the probability of hitting the target at least once is more than $\frac{7}{10}$, is :

(A) 3
(B) 5
(C) 2
(D) 4

Answer: (A) 3 · Key from source paper

Q219 JEE Main 2013 · 7 Apr · Offline MCQ

A multiple choice examination has 5 questions. Each question has three alternative answers out of which exactly one is correct. The probability that a student will get 4 or more correct answers just by guessing is :

(A) $\frac{11}{3^5}$
(B) $\frac{10}{3^5}$
(C) $\frac{17}{3^5}$
(D) $\frac{13}{3^5}$

Answer: (A) $\frac{11}{3^5}$ · Key from source paper

Q220 AIEEE 2012 · 26 May · Online MCQ

There are two balls in an urn. Each ball can be either white or black. If a white ball is put into the urn and there after a ball is drawn at random from the urn, then the probability that it is white is

(A) $\frac{1}{4}$
(B) $\frac{2}{3}$
(C) $\frac{1}{5}$
(D) $\frac{1}{3}$

Answer: (B) $\frac{2}{3}$ · Key from source paper

Q221 AIEEE 2012 · 19 May · Online MCQ

If six students, including two particular students A and B, stand in a row, then the probability that A and B are separated with one student in between them is

EdLoop JEE

(A) $\frac{8}{15}$
(B) $\frac{4}{15}$
(C) $\frac{2}{15}$
(D) $\frac{1}{15}$

Answer: (B) $\frac{4}{15}$ · Key from source paper

Q222 AIEEE 2012 · 12 May · Online MCQ

A number n is randomly selected from the set $\{1, 2, 3, ..., 1000\}$. The probability that $\frac{\sum_{i=1}^{n} i^2}{\sum_{i=1}^{n} i}$ is an integer is

(A) 0.331
(B) 0.333
(C) 0.334
(D) 0.332

Answer: (C) 0.334 · Key from source paper

Q223 AIEEE 2012 · Offline MCQ

Three numbers are chosen at random without replacement from $\{1, 2, 3, ...8\}$. The probability that their minimum is 3 , given that their maximum is 6 , is

(A) $\frac{3}{8}$
(B) $\frac{1}{5}$
(C) $\frac{1}{4}$
(D) $\frac{2}{5}$

Answer: (B) $\frac{1}{5}$ · Key from source paper

Q224 AIEEE 2011 MCQ

Consider 5 independent Bernoulli's trials each with probability of success p. If the probability of at least one failure is greater than or equal to $\frac{31}{32}$, then p lies in the interval

(A) $\left(\frac{3}{4}, \frac{11}{12}\right]$
(B) $\left[0, \frac{1}{2}\right]$
(C) $\left(\frac{11}{12}, 1\right]$
(D) $\left(\frac{1}{2}, \frac{3}{4}\right]$

Answer: (B) $\left[0, \frac{1}{2}\right]$ · Key from source paper

Q225 AIEEE 2011 MCQ

If C and D are two events such that $C \subset D$ and $P(D) \neq 0$, then the correct statement among the following is

(A) $P(C \mid D) \geq P(C)$
(B) $P(C \mid D) < P(C)$
(C) $P(C \mid D) = \frac{P(D)}{P(C)}$
(D) $P(C \mid D) = P(C)$

Answer: (A) $P(C \mid D) \geq P(C)$ · Key from source paper

Q226 AIEEE 2010 MCQ

Four numbers are chosen at random (without replacement) from the set $\{1, 2, 3, ..., 20\}$. Statement-1: The probability that the chosen numbers when arranged in some order will form an AP is $\frac{1}{85}$.
Statement-2: If the four chosen numbers form an AP, then the set of all possible values of common difference is $\{\pm 1, \pm 2, \pm 3, \pm 4, \pm 5\}$.

(A) Statement-1 is true, Statement-2 is true; Statement-2 is not the correct explanation for Statement-1
(B) Statement-1 is true, Statement-2 is false
(C) Statement-1 is false, Statement-2 is true
(D) Statement-1 is true, Statement-2 is true; Statement-2 is the correct explanation for Statement-1

Answer: (B) Statement-1 is true, Statement-2 is false · Key from source paper

Q227 AIEEE 2010 MCQ

An urn contains nine balls of which three are red, four are blue and two are green. Three balls are drawn at random without replacement from the urn. The probability that the three balls have different colour is

(A) $\frac{2}{7}$
(B) $\frac{1}{21}$
(C) $\frac{2}{23}$
(D) $\frac{1}{3}$

Answer: (A) $\frac{2}{7}$ · Key from source paper

Q228 AIEEE 2009 MCQ

In a binomial distribution $B\left(n, p = \frac{1}{4}\right)$, if the probability of at least one success is greater than or equal to $\frac{9}{10}$, then n is greater than

(A) $\frac{1}{\log_{10} 4 - \log_{10} 3}$
(B) $\frac{1}{\log_{10} 4 + \log_{10} 3}$
(C) $\frac{9}{\log_{10} 4 - \log_{10} 3}$
(D) $\frac{4}{\log_{10} 4 - \log_{10} 3}$

Answer: (A) $\frac{1}{\log_{10} 4 - \log_{10} 3}$ · Key from source paper

Q229 AIEEE 2009 MCQ

One ticket is selected at random from 50 tickets numbered $00, 01, 02, \ldots, 49$. Then the probability that the sum of the digits on the selected ticket is 8 , given that the product of these digits is zero, equals

(A) $\frac{1}{14}$
(B) $\frac{1}{7}$
(C) $\frac{5}{14}$
(D) $\frac{1}{50}$

Answer: (A) $\frac{1}{14}$ · Key from source paper

Q230 AIEEE 2008 MCQ

It is given that the events A and B are such that $P(A)=\frac{1}{4}, P\left(\frac{A}{B}\right)=\frac{1}{2}$ and $P\left(\frac{B}{A}\right)=\frac{2}{3}$. Then $P(B)$ is

(A) $\frac{1}{6}$
(B) $\frac{1}{3}$
(C) $\frac{2}{3}$
(D) $\frac{1}{2}$

Answer: (B) $\frac{1}{3}$ · Key from source paper

Q231 AIEEE 2008 MCQ

A die is thrown. Let A be the event that the number obtained is greater than 3 . Let B be the event that the number obtained is less than 5 . Then $P(A \cup B)$ is

(A) $\frac{3}{5}$
(B) 0
(C) 1
(D) $\frac{2}{5}$

Answer: (C) 1 · Key from source paper

Q232 AIEEE 2007 MCQ

A pair of fair dice is thrown independently three times. The probability of getting a score of exactly 9 twice is

(A) 1/729
(B) 8/9
(C) 8/729
(D) 8/243

Answer: (D) 8/243 · Key from source paper

EdLoop JEE

Q233 AIEEE 2006 MCQ

At a telephone enquiry system the number of phone cells regarding relevant enquiry follow Poisson distribution with an average of 5 phone calls during 10-minute time intervals. The probability that there is at the most one phone call during a 10-minute time period is

(A) $\frac{6}{5^e}$
(B) $\frac{5}{6}$
(C) $\frac{6}{55}$
(D) $\frac{6}{e^5}$

Answer: (D) $\frac{6}{e^5}$ · Key from source paper

Q234 AIEEE 2005 MCQ

Three houses are available in a locality. Three persons apply for the houses. Each applies for one house without consulting others. The probability that all the three apply for the same house is

(A) $\frac{2}{9}$
(B) $\frac{1}{9}$
(C) $\frac{8}{9}$
(D) $\frac{7}{9}$

Answer: (B) $\frac{1}{9}$ · Key from source paper

Q235 AIEEE 2005 MCQ

A random variable X has Poisson distribution with mean 2. Then $P(X > 1.5)$ equals

(A) $\frac{2}{e^2}$
(B) 0
(C) $1 - \frac{3}{e^2}$
(D) $\frac{3}{e^2}$

Answer: (C) $1 - \frac{3}{e^2}$ · Key from source paper

Q236 AIEEE 2005 MCQ

Let A and B be two events such that $P(\overline{A \cup B}) = \frac{1}{6}$, $P(A \cap B) = \frac{1}{4}$ and $P(\bar{A}) = \frac{1}{4}$, where $\bar{A}$ stands for complement of event A. Then events A and B are

(A) equally likely and mutually exclusive
(B) equally likely but not independent
(C) independent but not equally likely
(D) mutually exclusive and independent

Answer: (C) independent but not equally likely · Key from source paper

EdLoop JEE

Q237 AIEEE 2004 MCQ

The probability that A speaks truth is $\frac{4}{5}$, while this probability for B is $\frac{3}{4}$. The probability that they contradict each other when asked to speak on a fact is

(A) $\frac{3}{20}$
(B) $\frac{1}{5}$
(C) $\frac{7}{20}$
(D) $\frac{4}{5}$

Answer: (C) $\frac{7}{20}$ · Key from source paper

Q238 AIEEE 2004 MCQ

A random variable X has the probability distribution:

X :	1	2	3	4	5	6	7	8
p(X) :	0.15	0.23	0.12	0.10	0.20	0.08	0.07	0.05

For the events $E = \{X \text{ is a prime number }\}$ and $F = \{X < 4\}$, the probability $P(E \cup F)$ is

(A) 0.87
(B) 0.77
(C) 0.35
(D) 0.50

Answer: (B) 0.77 · Key from source paper

Q239 AIEEE 2004 MCQ

The mean and the variance of a binomial distribution are 4 and 2 respectively. Then the probability of 2 successes is

(A) $\frac{37}{256}$
(B) $\frac{219}{256}$
(C) $\frac{128}{256}$
(D) $\frac{28}{256}$

Answer: (D) $\frac{28}{256}$ · Key from source paper

Q240 AIEEE 2003 MCQ

The mean and variance of a random variable X having binomial distribution are 4 and 2 respectively, then P (X = 1) is

(A) $\frac{1}{4}$
(B) $\frac{1}{32}$
(C) $\frac{1}{16}$
(D) $\frac{1}{8}$

Answer: (B) $\frac{1}{32}$ · Key from source paper

Q241 AIEEE 2003 MCQ

Events A, B, C are mutually exclusive events such that $P(A) = \frac{3x+1}{3}$, $P(B) = \frac{1-x}{4}$ and $P(C) = \frac{1-2x}{2}$. The set of possible values of x are in the interval.

(A) $[0, 1]$
(B) $\left[\frac{1}{3}, \frac{1}{2}\right]$
(C) $\left[\frac{1}{3}, \frac{2}{3}\right]$
(D) $\left[\frac{1}{3}, \frac{13}{3}\right]$

Answer: (B) $\left[\frac{1}{3}, \frac{1}{2}\right]$ · Checked by our team

Q242 AIEEE 2003 MCQ

Five horses are in a race. Mr. A selects two of the horses at random and bets on them. The probability that Mr. A selected the winning horse is

(A) $\frac{2}{5}$
(B) $\frac{4}{5}$
(C) $\frac{3}{5}$
(D) $\frac{1}{5}$

Answer: (A) $\frac{2}{5}$ · Key from source paper

Q243 AIEEE 2002 MCQ

A problem in mathematics is given to three students A, B, C and their respective probability of solving the problem is $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$. Probability that the problem is solved is

(A) $\frac{3}{4}$
(B) $\frac{1}{2}$
(C) $\frac{2}{3}$
(D) $\frac{1}{3}$

Answer: (A) $\frac{3}{4}$ · Key from source paper

Q244 AIEEE 2002 MCQ

A and B are events such that $P(A \cup B) = 3/4, P(A \cap B) = 1/4, P(\bar{A}) = 2/3$ then $P(\bar{A} \cap B)$ is

(A) 5/12
(B) 3/8
(C) 5/8
(D) 1/4

Answer: (A) 5/12 · Key from source paper

Q245 AIEEE 2002 MCQ

A die is tossed 5 times. Getting an odd number is considered a success. Then the variance of distribution of success is

(A) 8/3
(B) 3/8
(C) 4/5
(D) 5/4

Answer: (D) 5/4 · Key from source paper

EdLoop JEE