MATHS

JEE (MAIN AND ADVANCED) MATHEMATICS

APPENDICES (REVISION EXERCISE)

Permutations Combinations

1. From 6 different novels and 3 different dictionaries , 4 novels and 1 dictionary are to be selected and arranged in a row on a shelf so that the dictionary is always in the middle . Then the number of such arrangements is

    A. at least 500 but than 750

    B. at least 750 but less than 1000

    C. at least 1000

D. less than 500

▶ **Watch Video Solution**

2. Number of ways in which n different prizes can be distributed among m-persons $(m < n)$ if each is entitled to receive atmost (n-1) prizes is

    A. $n^m - n$

    B. m^n

    C. mn

    D. $m^n - m$

▶ **Watch Video Solution**

3. There are 4 letters and 5 boxes in a row. Number of ways of posting these letters if all the letters are not posted in the same box is

A. 600

B. 620

C. 630

D. 700

Answer: B

 Watch Video Solution

4. We are required to form different words with the help of the word INTEGER. Let m_1 be the number of words in which I and N are never together and m_2 be the number or words which begin with I and end with R, then m_1/m_2 is

A. 42

B. 30

C. 6

D. $1/30$

Answer: B

▶ **Watch Video Solution**

5. The number of six digited numbers between 1,00,000 and 3,00,000 which are divisible by 4 and formed by rearranging digits of 112233 is

A. 12

B. 15

C. 18

D. 19

Answer: B

▶ **Watch Video Solution**

6. There are 5 different coloured balls and 5 boxes of the same colour as that of balls the number of ways that exactly two balls will go to its same coloured boxes is

A. 20

B. 32

C. 28

D. 44

Answer: A

▶ **Watch Video Solution**

7. Ajay writes letters to his five friends and addresses the corresponding. The number of ways can the letters by placed in the envelopes so that atleast two of them are in the wrong envelopes is

A. 120

B. 125

C. 119

D. 130

Answer: C

▶ **View Text Solution**

8. The sum of all the numbers that can be formed by taking all digits 2,3,4,4,5 only is

A. 2399976

B. 21844

C. 630624

D. 181440

Answer: A

9. The number of ways in which 5 boys and 3 girls can be seated on a round table if a particular boy B_1 and a particular girl G_1 never sit adjacent to each other is
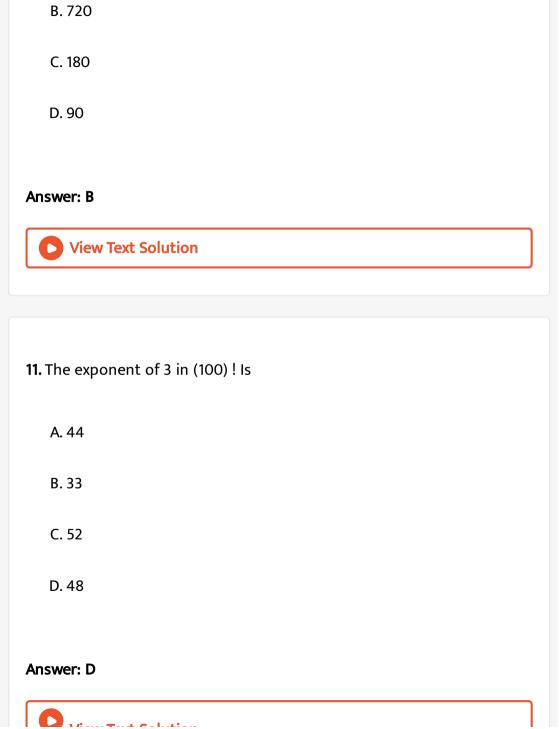
A. $7!$

B. $5 \times 6!$

C. $6 \times 6!$

D. $5 \times 7!$

Answer: B

10. Number of ways of arranging 4 boys and 3 girls so that no boy is in between any two girls

A. 360

B. 720

C. 180

D. 90

Answer: B

▶ View Text Solution

11. The exponent of 3 in (100) ! Is

A. 44

B. 33

C. 52

D. 48

Answer: D

▶ View Text Solution

12. 5-digit number are formed using 2,3,5,7,9 with out repeating the digits. If p is the number of such numbers that exceeds 20000 and q be the number of those that lie between 30000 and 90000, then p:q is

   A. $6:5$

   B. $3:2$

   C. $4:3$

   D. $5:3$

Answer: D

▶ **View Text Solution**

13. The sum of the digits in the unit's place of all the 4-digit numbers formed by using the numbers 3,4,5 and 6 without repetition is

A. 432

B. 108

C. 36

D. 18

Answer: B

> ▶ **View Text Solution**

---

14. An eight digit number divisible by 9 is to be formed using digits from 0 to 9 without repeating the digits. The number of ways in which this can be done is

A. $72(7!)$

B. $18(7!)$

C. $40(7!)$

D. $36(7!)$

Answer: D

15. 8-digit numbers are formed using the digits 1,1,2,2,2,3,4,4. The number of such numbers in which the odd digits do not occupy odd places, is

A. 160

B. 120

C. 60

D. 48

Answer: B

16. If there are 30 onto, mapping from a set containing n elements to the set {0,1} then n equals

A. 3

B. 5

C. 7

D. 2

Answer: B

▶ View Text Solution

---

17. A group of 2n students consisting of n boys and n girls are to be arranged in a row such that adjacent members are of opposite sex. The number of ways in which this can be done is

A. $2(n!)$

B. $(n!)^2$

C. $2(n!)^2$

D. $n!$

Answer: C

> ▶ View Text Solution

---

18. The total number of injective mapping from a set with m elements to a set with n elements for, $m > n$, is

A. $\dfrac{m!}{n!(m-n)!}$

B. $\dfrac{m!}{(m-n)!}$

C. n^m

D. zero

Answer: D

> ▶ View Text Solution

19. Suppose that six students, including Mudhu and Puja are having six beds arranged in a row. Further, suppose that Madhu does not want a bed adjacent to Puja. Then the number of ways, the beds can be allotted to students is

A. 264

B. 480

C. 600

D. 384

Answer: B

▶ **View Text Solution**

Combinations

1. $^{m}C_{r+1} + \displaystyle\sum_{k=m}^{n} {}^{k}C_{r}$ is equal to :

A. $^nC_{r+1}$

B. $^{n+1}C_{r+1}$

C. $^nC_{r-1}$

D. $^nC_{r-1}$

Answer: B

▶ **Watch Video Solution**

2. The value of $^{40}C_{31} + \sum_{r=0}^{10} {^{40+r}C_{10+r}}$ is equal to

A. $^{51}C_{20}$

B. $2^{50}C_{20}$

C. $2^{45}C_{15}$

D. $^{51}C_{21}$

Answer: A

3. A boat's crew consists of 8 men, 3 of whom can only row on one side, 2 only on the other. The number of ways the crew can be arranged.

A. 1728

B. $14 \times 9!$

C. $^{12}C_8$

D. $^9C_5$

Answer: A

4. A tea party is arranged for 16 people along two sides of a long table with 8 chairs on each side . Four men wish to sit on one particular side and two on the other side the number of ways that they can be seated is

A. $^{10}C_4$

B. $8!$

C. $^{10}C_4 \cdot 8!$

D. $^{10}C_4 \cdot (8!)^2$

Answer: D

5. There are 12 points in a plane of which no three points are collinear and 5 points are concyclic . The number of different circles that can be drawn through atleast 3 points of these points is

A. 120

B. 220

C. 211

D. 144

Answer: C

---

6. In a crossword puzzle 10 words are to be guessed of which 5 words have each an alternative solution also. Number of possible solutions is a

    A. 8

    B. 16

    C. 32

    D. 64

Answer: C

7. A gentlemen hosts a party of (m+n) guests and places 'm' at one round table and the remaining 'n' at the other round table. Number of ways the guests can be arranged is

A. $\dfrac{(m+n)!}{m \cdot n}$

B. $\dfrac{(m+n)}{m \cdot n}$

C. $\dfrac{(m+n)}{m! \cdot n!}$

D. $\dfrac{(m+n)}{m^n}$

Answer: A

▶ **Watch Video Solution**

---

8. There are n straight lines in a plane, no two of which are parallel and no three pass through the same point. Their points of intersection are joined. The number of fresh lines thus formed is

A. $\dfrac{n(n-1)(n-2)(n-3)}{8}$

B. $\dfrac{n(n+1)(n-2)(n-3)}{8}$

C. $\dfrac{n(n+1)(n+2)(n-3)}{8}$

D. $\dfrac{n(n+1)(n+2)(n+3)}{8}$

Answer: A

9. Total number of ways in which n^2 number of identical balls can be put in 'n' numbered boxes {1.2.3. . . . n} such that i^{th} box contains atleast i number of balls

A. $^{n^2}C_{n-1}$

B. $^{n^2-1}C_{n-1}$

C. $\dfrac{n^2+n-2}{2}C_{n-1}$

D. $n!$

Answer: C

10. The number of ways in which an examiner can assign 30 marks to 8 question, giving no less than 2 marks to any questions is

A. $^{21}C_7$

B. $^{21}C_8$

C. $^{21}C_7$

D. $^{30}C_8$

Answer: C

11. A committee of 4 persons is to be formed from 2 ladies 2 old man and 4 youngmen such that it includes at least 1 lady, at least one old

man and at most 2 youngmen. Then the total number of ways in which this committee can be formed is

A. 40

B. 41

C. 16

D. 32

Answer: B

▶ View Text Solution

12. On the sides AB,BC,CA of triangle AB, 3,4,5 distinct points (excluding vertices A, B, C) are respectively chosen. The number of triangles that can be constructed using these chosen points as vertices are

A. 210

B. 205

C. 215

D. 220

Answer: B

> ▶ **Watch Video Solution**

13. Two women and some men participated in a chess tournament in which every participant played two games with each of the other participants. If the number of games that the men played between themselves exceeds the number of games that the men played with the women by 66, then the number of men who participated in the tournament lies in the interval

A. [8,9]

B. [10,12]

C. [11,13]

D. [14,1]

Answer: B

14. A set B contain 2007 elements. Let C be the set consisting of subsets of B which contain at most 1003 elements. The number of elements is C is

A. 2^{2005}

B. 2^{2006}

C. 2^{1003}

D. 2^{2007}

Answer: B

15. A parallelogram is cut by two set of n parallel lines, parallel to the sides of the parallelo-gram. The number of parallelograms formed is

A. $\left(^{n+2}C_2\right)\left(^{n+2}C_2\right)$

B. $\left(^nC_2\right)\left(^{n+1}C_2\right)$

C. $\left(^nC_2\right)\left(^{n+2}C_2\right)$

D. $\left(^nC_2\right)\left(^nC_2\right)$

Answer: A

▶ View Text Solution

16. Let A be a set containing ten elements. Then the number of subsets of A containing at least four elements is

A. 845

B. 848

C. 850

D. 854

Answer: B

> ▶ **View Text Solution**

---

17. The maximum possible number of points of intersection of 8 straight

lines and 4 circles is

A. 164

B. 76

C. 104

D. 32

Answer: C

> ▶ **View Text Solution**

18. A committee consisting of at least three members is to be formed from a group of 6 boys and 6 girls such that it always has a boy and a girl. The number of ways to form such committee is

A. $2^{12} - 2^7 - 13$

B. $2^{11} - 2^6 - 13$

C. $2^{12} - 2^7 - 35$

D. $2^{11} - 2^7 - 35$

Answer: A

▶ View Text Solution

19. The least positive integral value of x for which $^{10}C_{x-1} > 2(^{10}C_x)$ is

A. 5

B. 8

C. 9

D. 6

Answer: B

▶ **View Text Solution**

20. The number of integers greater than 6,000 that can be formed, using the digits 3,5,6,7 and 8, without repetition, is :

A. 216

B. 192

C. 120

D. 72

Answer: B

▶ **Watch Video Solution**

1. Let S be the sample space of the random experiment of throwing simultaneously two unbaised dice with six faces (numbered1 to 6) and let $E_k = \{(a, b) \in S : ab = k\} f$ or $k \geq 1$. If $P_k = P(E_k) f$ or $k \geq 1$ then the correct, among the following is

A. $P_1 < P_{30} < P_4 < P_6$

B. $P_{36} < P_6 < P_2 < P_4$

C. $P_1 < P_{11} < P_4 < P_6$

D. $P_{36} < P_{11} < P_6 < P_4$

Answer: A

▶ Watch Video Solution

2. If three dice are thrown, the probability that they show the numbers in A.P. is

A. $\dfrac{1}{36}$

B. $\dfrac{1}{12}$

C. $\dfrac{2}{9}$

D. $\dfrac{5}{18}$

Answer: B

▶ View Text Solution

3. An unbiased die is rolled 4 times. Out of 4 face values obtained, the probability that the minimum face value is not less than 2 and the maximum face value is not greater than 5 is

A. $\dfrac{16}{81}$

B. $\dfrac{1}{81}$

C. $\dfrac{80}{81}$

D. $\dfrac{65}{81}$

Answer: A

4. The numbers 1,2,3,..n are arranged in a random order. The probability that the digits 1,2,3,....k$(k < n)$ appear as neighbours is

A. $\dfrac{(n-k)!}{n!}$

B. $\dfrac{n-k+1}{{}^nC_k}$

C. $\dfrac{n-k}{{}^nC_k}$

D. $\dfrac{k!}{n!}$

Answer: B

5. Out of 7 tickets consecutively numbered 3 are drawn at random. The probability for the numbers on the tickets to be in A.P. is

A. $\dfrac{9}{35}$

B. $\dfrac{^5C_3}{^7C_3}$

C. $\dfrac{10}{35}$

D. $\dfrac{2}{5}$

Answer: A

▶ **Watch Video Solution**

6. There are 2 locks on the door and the door keys are among the 6 different ones you carry in your pocket . In a hurry one key is dropped somewhere by you. The probability that you can still open the door is

A. $1/2$

B. $4/9$

C. $2/3$

D. $1/4$

Answer: C

---

7. An ellipse of eccentricity $\dfrac{2\sqrt{2}}{3}$ is inscribed in a circle and a point within the circle is chosen at random. The probability that this point lies outside the ellipse is

A. $1/9$

B. $4/9$

C. $1/3$

D. $2/3$

Answer: D

8. Four positive integers are taken at random and are multiplied together. Then the probability that the product ends in an odd digit other than 5 is

A. $\dfrac{609}{625}$

B. $\dfrac{16}{625}$

C. $\dfrac{2}{5}$

D. $\dfrac{1}{5}$

Answer: B

▶ **View Text Solution**

9. If 5 positive integers are taken at random and multiplied together. The probability that the last digit of the product is 2,4,6,8 is

A. $\dfrac{4^5 - 2^5}{5^5}$

B. $\dfrac{4^n + 3^n}{5^5}$

C. $\dfrac{1}{5^5}$

D. $\dfrac{1}{10^5}$

Answer: A

▶ **View Text Solution**

---

10. Fifteen coupons are numbered 1,2,. . . . 15 respectively seven coupons are selected at random one at time with replacement. The probability that the largest number appearing on a selected coupons is 9 is

A. $\left(\dfrac{9}{16}\right)^6$

B. $\left(\dfrac{8}{15}\right)^7$

C. $\left(\dfrac{3}{5}\right)^7$

D. $\dfrac{9^7 - 8^7}{15^7}$

Answer: D

▶ **View Text Solution**

11. A man draws a card from a pack one after another with replacement until he gets red card. The probability that he gets red card in 4th draw is

A. $\dfrac{1}{16}$

B. $\dfrac{1}{8}$

C. $\dfrac{1}{4}$

D. $\dfrac{1}{2}$

Answer: A

▶ **Watch Video Solution**

12. A man draws a card from a pack one after another with replacement until he gets red card. The probability that he gets red card in 4th draw is

A. $\dfrac{1}{2}$

B. $\dfrac{1}{3}$

C. $\dfrac{2}{3}$

D. $\dfrac{3}{5}$

Answer: B

▶ **Watch Video Solution**

---

13. A fair coin is tossed 10 times. The probability of getting as many heads in the first 5 tosses as in the last 5 tosses is

A. $\dfrac{1}{2^{10}}$

B. $\dfrac{1}{2^{9}}$

C. $\dfrac{^{10}C_5}{2^{10}}$

D. $\dfrac{1}{2}$

Answer: C

14. There are 4 machines out of which 2 are defective. They are tested one by one at random till both the defective machines are identified. The probability that only two tests are needed for this is

A. $\dfrac{1}{2}$

B. $\dfrac{1}{3}$

C. $\dfrac{1}{4}$

D. $\dfrac{1}{6}$

Answer: B

15. A doctor is to visit a patient. From the past experience, it is known that the probabilities that he will come by train, bus, scooter or by

other means of transport are respectively $\dfrac{3}{10}, \dfrac{1}{5}, \dfrac{1}{10}$ and $\dfrac{2}{5}$. The probabilities that he will be late are $\dfrac{1}{4}, \dfrac{1}{3}$ and $\dfrac{1}{12}$, is he comes by train, bus and scooter respectively, but if he comes by other means of transport, then he willnot be late. When he arrives, he is late. The the probability that he comes by train is

A. $\dfrac{1}{2}$

B. $\dfrac{1}{3}$

C. $\dfrac{2}{3}$

D. $\dfrac{3}{5}$

Answer: A

▶ Watch Video Solution

16. A person has undertaken a construction job. The probablities are 0.65 that will be strike, 0.80 that the construction job will becompleted on time if there is no strike, and 0.32 that the construction job will be

completed on time if there is a strike. Then the probability that the construction job will be completed on time is

A. 0. 788

B. 0. 488

C. 1. 488

D. 1.634

Answer: B

▶ Watch Video Solution

17. A box contain three coins, one coin is fair, one coin is two-headed, and one coin is weighted so that the probability of heads, appearing is 1/3 . A coin is selected at random and tossed. Then the probability that heads appears is

A. $\dfrac{11}{18}$

B. $\dfrac{12}{18}$

C. $\dfrac{13}{18}$

D. $\dfrac{14}{18}$

Answer: A

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

A. $\dfrac{17}{3^5}$

B. $\dfrac{13}{3^5}$

C. $\dfrac{11}{3^5}$

D. $\dfrac{10}{3^5}$

Answer: C

19. A bag contains 2 n + 1 coins. If is known that n of these coins have a head on both sides, whereas the remaining n + 1 coins are fair. A coin is picked up at random from the bag and tosses. If the probability that the toss results in a head is 31/42 , then n=

    A. 10

    B. 11

    C. 12

    D. 13

Answer: A

20. Given two independent events, if the probability that exactly one of them occurs is 26/49 and the probability that none of them occurs is 15/49, then the probability of more probable of two events is

A. $\dfrac{4}{7}$

B. $\dfrac{6}{7}$

C. $\dfrac{3}{7}$

D. $\dfrac{5}{7}$

Answer: A

▶ View Text Solution

---

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

A. [0,1]

B. $\left[\dfrac{1}{3}, \dfrac{2}{9}\right]$

C. $\left[-\dfrac{1}{3}, \dfrac{5}{9}\right]$

D. $\left[-\dfrac{7}{9}, \dfrac{4}{9}\right]$

Answer: C

▶ **Watch Video Solution**

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

A. $\dfrac{21}{64}$

B. $\dfrac{7}{8}$

C. $\dfrac{7}{32}$

D. $\dfrac{9}{64}$

Answer: A

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

A. A and B are equally likely

B. $P(A \cap B') = 0$

C. $P(A' \cap B) = 0$

D. $P(A) + P(B) = 1$

Answer: D

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

A. 0. 71

B. 0. 70

C. 0. 51

D. 0. 20

Answer: A

▶ **Watch Video Solution**

25. Let A and E be two events with positive probabilites

Statement 1 : $P(E/A) \geq P(A/E)P(E)$

Statement 2 : $P(A/E) \geq P(A \cap E)$

A. both statements are true

B. both statements are false

C. statement 1 is true, statement 2 is false

D. statement 1 is false, statement 2 is true

Answer: A

---

26. Two events A and B are such that P(B) = 0 . 55 and P(AB') = 0 . 15 . The probability of occurence of at least one of event is

A. 0.70

B. 0.20

C. 0.35

D. 0.30

Answer: A

---

27. An urn contains four balls bearing numbers 1,2,3 and 123 respectively . A ball is drawn at random from the urn. Let $E_p i = 1, 2, 3$ donote the

event that digit i appears on the ball drawn

statement 1 : $P(E_1 \cap E_2) = P(E_1 \cap E_3) = P(E_2 \cap E_3) = \dfrac{1}{4}$

Statement 2 : $P_{E_1} = P(E_2) = P(E_3) = \dfrac{1}{2}$

A. Statement 1 and statement 2 are both false

B. Statement 1 and statement 2 are both true

C. Statement 1 is true and statement 2 is false

D. Statement 1 is false and statement 2 is true

Answer: B

28. Three dice, red, blue and green in colour are rolled together. Let B be the event that sum of the numbers shown up is 7. Let A be the event that the red die shows 1. The conditional probability of the events A given B, P (A|B) is

A. $\dfrac{2}{7}$

B. $\dfrac{1}{6}$

C. $\dfrac{1}{7}$

D. $\dfrac{1}{3}$

Answer: D

▶ **Watch Video Solution**

---

29. Set $A, B, C, A \cap B, A \cap B, A \cap C, B \cap C$ and $A \cap B \cap C$ have 35, 40, 45, 13, 12, 14 and 5 elements respectively. An element is selected at random from the set $a \cup V \cup C$. The probability that the selected element belongs to only set A is

A. $\dfrac{13}{86}$

B. $\dfrac{35}{86}$

C. $\dfrac{5}{86}$

D. $\dfrac{15}{86}$

Answer: D

30. A man is known to speak the truth on an average 3 out of 4 times. He throws a fair die and reports that it is a six. The probability the it is actually a six is

A. $\dfrac{3}{5}$

B. $\dfrac{3}{8}$

C. $\dfrac{3}{4}$

D. $\dfrac{1}{5}$

Answer: B

31. A class consists of 80 students, 25 of them are girls. If 10 of the students are rich and 20 of the students are fair complexioned, then the probability of selecting a fair complexioned rich girl from the class (assuming three traits as independent) is

A. $\dfrac{1}{10}$

B. $\dfrac{1}{32}$

C. $\dfrac{5}{512}$

D. $\dfrac{7}{512}$

Answer: C

▶ Watch Video Solution

32. If P(A) = 0 . 4 , P(B')= 0.6 and $P(A \cap B)$ = 0 . 15, then the value of $P(A/A' \cup B')$ is

A. $\dfrac{1}{17}$

33. Let A and B be two events such that

$P(A \cup B) \geq 3/4$ and $1/8 \leq P(A \cap B) \leq 3/8$

Statement 1 : $P(A) + P(B) \geq 7/8$

Statement 2 : $P(A) + P(B) \leq 11/8$

A. Statement 1 and statement 2 are both false

B. Statement 1 and statement 2 are both true

C. Statement 1 is true and statement 2 is false

D. Statement 1 is false and statement 2 is true

Answer: B

34. A baised coin with probability p,$0 < p <$ of heads is tossed until a head appears for the first time. If the probability that the number of tosses required is even is 2/5, then p is equal to

A. $\dfrac{2}{3}$

B. $\dfrac{1}{2}$

C. $\dfrac{1}{3}$

D. $\dfrac{1}{4}$

Answer: C

Random Variable

1. A student has to match three historical events Dandi March, Quit India movement and Mahatma Gandhi Assassination with the years 1948,1930 and 1942. The student has no knowledge of the correct answers and decided to match the events and years randomly. If x denotes the number of correct answers he gets, then mean of x is

A. 0.5

B. 1

C. 1.5

D. 2

Answer: B

▶ **Watch Video Solution**

2. If three letters are placed in three addressed envelopes then the mean and variance of X where X denotes the number of correct

despatches.

A. 1,1

B. 1,2

C. 2,1

D. 2,2

Answer: A

▶ **Watch Video Solution**

3. A body is thrown horizontally with a velocity of v m/s from the top of

a tower of height 2h reaches the ground in 't' seconds. If another body

double the mass is thrown horizontally with a velocity 5v m/s from the

top of another tower of height 8h. In the above problem if the first

reaches the ground at a horizontal distance 'x' the second body reaches

the ground at a horizontal distance

A. 1

B. 2

C. 3

D. 1.5

Answer: B

▶ Watch Video Solution

4. Suppose x is binomial distribution with parameters n=8 and $p = \dfrac{1}{2}$ then $P(|x - 4| \leq 2)$ is

A. $\dfrac{114}{123}$

B. $\dfrac{119}{128}$

C. $\dfrac{7}{33}$

D. $\dfrac{103}{124}$

Answer: B

▶ View Text Solution

5. When a die is rolled twice, if the event of getting an even number is denoted by a success and the number of successes as a random and the number of successes as a random variable, then distribution and mean of the variate are

A. $\begin{array}{ccc} 0 & 1 & 2 \\ 1/4 & 1/2 & 1/4 \end{array}, \mu = 1$

B. $\begin{array}{ccc} 0 & 1 & 2 \\ 1/3 & 1/2 & 1/4 \end{array}, \mu = 2$

C. $\begin{array}{ccc} 0 & 1 & 2 \\ 1/2 & 1/3 & 1/4 \end{array}, \mu = 3$

D. $\begin{array}{cccc} 0 & 1 & 2 & 3 \\ 1/4 & 1/4 & 1/4 & 1/4 \end{array}, \mu = 1$

Answer: A

▶ Watch Video Solution

6. Suppose $X \sim B(n, p)$ and $P(X = 3) = P(X = 5)$. If $P > \dfrac{1}{2}$

A. $n \leq 7$

B. $n > 8$

C. $n \geq 9$

D. $n < 10$

Answer: A

▶ **Watch Video Solution**

---

7. In a hurdle race a player has to cross 10 hurdles. The probability that he will clear each hurdle is 5/6 . The probability that he will knock down fewer then two hurdles is

A. $\dfrac{2}{5} \times \dfrac{6^9}{15^{10}}$

B. $\dfrac{3 \times 6^9}{5^{10}}$

C. $\dfrac{3 \times 5^{10}}{6^{10}}$

D. `(5)^10/(2)(6)^9

Answer: C

8. Six dice are thrown 729 times. The numbers of times you expect atleast 3 dice to show either 5 or 6 is

A. 233

B. 249

C. 396

D. 433

Answer: A

9. 'S' is the sample space obtained when a pair of symmetric dice are tossed , X is the random variable defined by X(a,b) = max {a,b} so that the range of X is the set {1,2,3,4,5,6}. Then the mean of X is

A. 5. 5

B. 5. 57

C. 4. 97

D. 4. 47

Answer: D

▶ **Watch Video Solution**

---

10. A person plays a game of tossing a coin thrice. For each head, he is given Rs 2 by the organiser of the game and for each tail, he has to give Rs. 1.50 to the organise. Let X denote the amount gained or lost by the person . Thus write the Range of Distribution.

A. {-1, 2 . 50, - 4.50, 6}

B. {-2, 4.50, -3.50, 6}

C. {-3, 4.50, -3.50, 8}

D. {-4, 6.50, -3.50, 6}

Answer: A

▶ **View Text Solution**

11. Let x represent the difference between the number of heads and the numbers of tails obtained when a coin is tossed 6 times. Then possible values of X is

A. {6,4,2,0}

B. {1,2,4,}

C. {3,4,6}

D. {1,6,9}

Answer: A

▶ **View Text Solution**

12. Two numbers are selected at random (with-out replacement) from the first six positive integers. Let X denote the larger of the two numbers obtained. Then E(X) is

A. $\dfrac{2}{3}$

B. $\dfrac{14}{3}$

C. $\dfrac{16}{3}$

D. $\dfrac{20}{3}$

Answer: B

▶ View Text Solution

13. The mean of the numbers obtained on throwing a die having written 1 on three faces, 2 on two faces and 5 on one face is

A. 2

B. 2

C. 5

D. $\dfrac{20}{3}$

Answer: B

> ▶ View Text Solution

14. On a multiple choice examination with three possible answers for each of the five questions. Then what is the probability that a candidate would get four or more correct answer is

A. $\dfrac{12}{243}$

B. $\dfrac{11}{243}$

C. $\dfrac{14}{243}$

D. $\dfrac{16}{243}$

Answer: B

> ▶ Watch Video Solution

15. The probability of a man hitting a target is $\dfrac{2}{5}$. He fires at the target

k times (k, a given number) . Then the minimum k, so that the

probability of hitting the targer at least once is more than $\dfrac{7}{10}$, is

A. 3

B. 5

C. 2

D. 4

Answer: A

▶ Watch Video Solution

16. If X has a binomial distribution, B (n,p) with parameters n and p such

that P(X=2)=P(X=3), then E(X) , the mean of variable X, is

A. 2 - p

B. 3 - p

C. p/2

D. p/3

Answer: B

▶ Watch Video Solution

17. If 12 identical balls are to be placed in 3 iden-tical boxes, then the probability that one of the boxes contains exactly 3 balls is :

A. $\dfrac{55}{3}\left(\dfrac{2}{3}\right)^{11}$

B. $55\left(\dfrac{2}{3}\right)^{10}$

C. $220\left(\dfrac{1}{3}\right)^{12}$

D. $22\left(\dfrac{1}{3}\right)^{11}$

Answer: A

▶ Watch Video Solution

1. The number of students absent in a class were recorded every day for 120 days and the information is given in the following frequency table. Then mean number of students absent per day is

No. of student absent	0	1	2	3	4	5	6	7
No. of days		1	4	10	50	34	15	4	2

A. 3. 325

B. 3. 425

C. 3. 525

D. 4. 525

Answer: C

▶ View Text Solution

2. The frequency distribution of the marks obtained by 100 students in a

test carrying 50 marks is given below. Then the mean is

Marks	0 − 9	10 − 20	20 − 29	30 − 39	40 − 49
No. of students	8	15	20	45	12

A. 28. 3

B. 28

C. 27. 3

D. 26. 4

Answer: A

▶ **View Text Solution**

3. For a certain frequency table which has been partly reproduced here,

the arithmetic mean was found to be Rs. 28.07

Income (in Rs.)	15	20	25	30	35	40
No. of workers	8	12	?	16	?	10

If the total number of workers is 75, then the missing frequencies are

A. 14,15

B. 15,14

C. 13,16

D. 12,17

Answer: B

▶ **Watch Video Solution**

---

4. From a frequency distribution, c = 3, l = 65 . 5 f = 42, m = 23, N = 102 then median is (l = lower limit of the median class, m= cumulative frequency of the class preceeding the median class, N = total frequency, f = frequency of the median class, c = width of the median class)

A. 65.5

B. 67.50

C. 66.93

D. 66.43

Answer: B

> ▶ **View Text Solution**

5. The sum of 100 observations and the sum of their squares are 400 and 2475 , respectively. Later on three observations 3,4 and 5, were found to be incorrect. if the correct observations are omitted. then the variance of the remaining observations is

A. 8. 00

B. 8. 25

C. 9. 00

D. 8. 50

Answer: C

> ▶ **Watch Video Solution**

6. The mean ago of 25 teachers in a schools is 40 years. A teacher retires at the age of 60 years and a new teacher is appointed in his place . If now the mean age of the teachers in this schools is 39 years, then the age (in years) of the newly appointed teacher is

A. 35

B. 30

C. 40

D. 25

Answer: A

▶ Watch Video Solution

7. Given the following frequency distribution with some missing frequencies .

Class	10 − 20	20 − 30	30 − 40	40 − 50	50 − 60	60 − 70	70 − 80
f	180	−	34	180	136	−	50

If the total frequency is 685 and median is 42.6 then the missing frequencies are

A. 81,24

B. 80,25

C. 82,23

D. 83,22

Answer: C

 Watch Video Solution

8. The median from the following data is

Mid-value	Frequency
115	6
125	25
135	48
145	72
155	116
165	60
175	38
185	22
195	3

A. 153.79

B. 153.91

C. 165.18

D. 165.93

Answer: A

▶ **View Text Solution**

9. The median of the following data is

Marks obtained	No. of students
less than 20	0
less than 30	4
less than 40	16
less than 50	30
less than 60	46
less than 70	66
less than 80	82
less than 90	92
less than 100	100

A. 62

B. 64

C. 63

D. 52

Answer: A

10. The median of the following data is

Class interval	Frequency
110 − 119	5
120 − 129	25
130 − 139	40
140 − 140	60
150 − 159	40
160 − 169	25
170 − 179	5

▶ Watch Video Solution

11. The mode for the following frequency distribution is

C.I.	0 − 4	4 − 8	8 − 12	12 − 16
Frequency	4	8	5	6

▶ Watch Video Solution

12. Marks scored by 100 students in a 25 marks unit test of Mathematics

is given below. Their median is

Marks	0 − 5	5 − 10	10 − 15	15 − 20	20 − 25
Students	10	18	42	23	7

A. 12

B. 12.63

C. 12.3

D. 12.7

Answer: B

▶ **Watch Video Solution**

13. Given the following frequency distribution with some missing

frequencies

Wages (RS)	$60 - 70$	$50 - 60$	$40 - 50$	$30 - 40$	$20 - 30$
No. of labourers	5	10	f_1	5	f_2

If the total frequency is 43 and median is 46.75 then the missing

frequencies are

A. 18,5

B. 20,3

C. 17,6

D. 15,8

Answer: B

> ▶ Watch Video Solution

14. If the median and the range of four numbers {x,y,2x,+y,x-y}, where $0 < y < x < 2y$ are 10 and 28 respectively, then the mean of numbers is

A. 18

B. 10

C. 5

D. 14

Answer: D

> ▶ Watch Video Solution

15. The mean of a data set consisting of 20 observation is 40. If one observation 53 was wrongly recorded as 33, then the correct mean will be

A. 41

B. 49

C. 40.5

D. 42.5

Answer: A

▶ Watch Video Solution

16. In a set of 2n distinct observations, each of the observations below the median of all the observations is increased by 5 and each of the

remaining observation is decreased by 3 . Then the mean of the new set of observations

A. increase by 1

B. decrease by 1

C. decrease by 2

D. increase by 2

Answer: A

▶ Watch Video Solution

17. Let $\bar{x}$ and M.D be the mean and the mean deviation about $\bar{x}$ of n observations x_p, $i = 1, \ 2 \ . \ . \ . \ . \ . \ n$. If each of the observation is increased by 5, then the new mean deviation about the new mean, respectively are .

A. $\bar{x}, \ M. \ D$

B. $\bar{x} + 5, M.D$

C. $\bar{x}, M.D. + 5$

D. $\bar{x} - 15, mM.D. + 5$

Answer: B

▶ **Watch Video Solution**

18. The mean of the data set comprising of 16 observations is 16. If one of the observation valued 16 is deteted and three new observa- tions valued 3,4 and 5 are added to the data, then the mean of the resultant data, is :

A. 16.8

B. 16.0

C. 15.8

D. 14.0

Answer: D

Sequence And Series

---

1. If the sum of n terms of an A.P. is $nP + \frac{1}{2}n(n-1)Q$, where P and Q are constants, then the common difference is

A. 1

B. Q

C. P

D. P-Q

Answer: B

2. The income of a person is RS. 3,00,000, in the first year and he receives an increase of Rs. 10,000 to his income per year for the next 19 years, then the total amount, he received in 20 years is

A. 60000

B. 39000

C. 79,00,000

D. 12,00,000

Answer: C

▶ **View Text Solution**

3. The sum of odd integers from 1 to 2001 is

A. 100200

B. 102001

C. 202001

D. 502001

Answer: A

▶ **View Text Solution**

---

4. In an A.P., the first term is 2 and the sum of the first five terms in one-fourth of the next five terms then the 20th term is

A. 212

B. -112

C. 413

D. -110

Answer: B

▶ **View Text Solution**

5. A man starts repaying a loan as first instalment of Rs. 100. If the increases the instalment by Rs. 5 every month, then the amount he will pay in the 30th instalment is

    A. 245

    B. 345

    C. 445

    D. 550

Answer: A

> ▶ **View Text Solution**

---

6. How many terms of the G.P. 3, $\dfrac{3}{2}$, $\dfrac{3}{4}$, ... are needed to give the sum $\dfrac{3069}{512}$ is

    A. 20

    B. 15

C. 10

D. 16

Answer: C

▶ **Watch Video Solution**

7. A person has 2 parents, 4 grandparents, 8 great grandparents, and so on, then the number of his ancestors during the ten generations preceeding his own is

A. 2046

B. 3046

C. 4046

D. 5056

Answer: A

▶ **Watch Video Solution**

8. The sum of first three terms of a G.P. is 39/10 and their product is 1. Find the common ratio and the terms.

A. $5/2$

B. $3/5$

C. $7/5$

D. $1/5$

Answer: A

▶ **Watch Video Solution**

9. If the 4th, 10th and 16th terms of a G.P. are x,y and z respectively, then x,y,z are in

A. G.P.

B. A.P.

C. H.P.

D. A.G.P.

10. The sum of two number is 6 times their geometric mean, then the numbers are in the ratio is

A. $\left(3 + 2\sqrt{2}\right) : \left(3 - 2\sqrt{2}\right)$

B. $3 - \sqrt{2} : 4 + \sqrt{2}$

C. $2 - \sqrt{2} : 2 + \sqrt{2}$

D. $5 - \sqrt{2} : 5 + \sqrt{2}$

11. The sum of n terms of the series :

5 + 11 + 19+ 29+ 41 . . . is

A. $\dfrac{n(n-1)(n- +7)}{5}$

B. $\dfrac{n(n+2)(n+4)}{3}$

C. $\dfrac{n(n+5)(n+1)}{9}$

D. $\dfrac{(n+1)(n+3)(n+7)}{5}$

Answer: B

▶ **Watch Video Solution**

---

12. If m is the A.M. of two distinct real number l and n $(l, n > 1)$ and G_1, G_2 and G_3 are three geometrc means between l and n then $G_1^4 + 2G_2^4 + G_3^4$ equals.

A. $4l^2mn$

B. $4lm^2n$

C. $4lmn^2$

D. $4l^2m^2n^2$

Answer: B

▶ **Watch Video Solution**