MATHS

BOOKS - NCERT EXEMPLAR MATHS (HINGLISH)

STATISTICS AND PROBABILITY

Statistics And Probability

1. In the formula $\bar{x} = a + \frac{\sum f_i d_i}{\sum f_i}$ for finding the mean of grouped data d_i'S

and deviation from a of

A. lower limits of the classes

B. upper limits of the classes

C. mid-points of the classes

D. frequencies of the class marks

Answer: C

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2. While computing mean of grouped data, we assume that the frequecies are

A. evenly distributed over all the classes

B. centred at the class marks of the classes

C. centred at the upper limits of the classes

D. centred at the lower limits of the classes

Answer: B

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3. If $x_i's$ are the mid-points of the class intervals of grouped data, $f_i's$ are the corresponding frequencies and $\bar{x}$ is the mean, then $\sum (f_i x_i - \bar{x})$ equal to

A. 0

B. -1

C. 1

D. 2

Answer: A

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4. In the formula $\bar{x} = a + h\frac{\sum f_i u_i}{\sum f_i}$ for finding the mean of grouped frequency distribution u_i is equal to

A. $\frac{x_i + a}{h}$

B. $h(x_i - a)$

C. $\frac{x_i - a}{h}$

D. $\frac{a - x_i}{h}$

Answer: C

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5. The abscissa of the point of intersection of the less that type of the more than type cumulative frequency curves of a grouped data gives its

A. mean

B. median

C. mode

D. All of these

Answer: B

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6. For the following distribution

Class	0 - 5	5 -10	10 -15	15 - 20	20 - 25
Frequency	10	15	12	20	9

the lower limits of the modal class is

A. 15

B. 25

C. 30

D. 35

Answer: A

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7. Consider the following frequency distribution

Class	0-5	6-11	12-17	18-23	24-29
Frequency	13	10	15	8	11

The upper limit of the median class in

A. 17

B. 17.5

C. 18

D. 18.5

Answer: B

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8. For the following distribution

Marks	Number of students
Below 10	3
Below 20	12
Below 30	27
Below 40	57
Below 50	75
Below 60	80

the modal class is

A. 40-50

B. 20-30

C. 30-40

D. 50-60

Answer: C

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9. Consider the data

Class	65-85	85-105	105-125	125-145	145-165	165-185	185-205
Frequency	4	5	13	20	14	7	4

The difference between the upper limit of the median class and the lower limit of the modal class is

A. 0

B. 19

C. 20

D. 38

Answer: C

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10. The times(in second) taken by 150 atheletes to run a 110 m hurdle race are tabulated below

Class	13.8-14	14-14.2	14.2-14.4	14.4-14.6	14.6-14.8	14.8-15
Frequency	2	4	5	71	48	20

The number of atheletes who completed the race in less than 14.6s is

A. 11

B. 71

C. 82

D. 130

Answer: C

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11. Consider the following distribution

Marks obtained	Number of students
More than or equal to 0	63
More than or equal to 10	58
More than or equal to 20	55
More than or equal to 30	51
More than or equal to 40	48
More than or equal to 50	42

Frequency of the class 30-40 is

A. 3

B. 4

C. 48

D. 51

Answer: A

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12. If an event cannot occur, then its propbability is

A. 1

B. $\frac{3}{4}$

C. $\frac{1}{2}$

D. 0

Answer: D

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13. Which of the following cannot be the probability of an event?

A. $\frac{1}{3}$

B. 0.1

C. 0.333

D. $\frac{17}{16}$

Answer: D

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14. An event is very unlikely to happen. Its probability is closet to

A. 0.0001

B. 0.001

C. 0.01

D. 0.1

Answer: A

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15. If the probability of an event is P, then the probability of its completmentry event will be

A. P-1

B. P

C. 1-P

D. $1 - \frac{1}{P}$

Answer: C

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16. The probability expressed as a percentage of a particular occurrence can never be

A. less than 100

B. less than 0

C. greater than 1

D. anything but a whole number

Answer: B

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17. If P(A) denotes the probability of an event, then

A. $P(A) < 0$

B. $P(A) > 1$

C. $0 \leq P(A) \leq 1$

D. $-1 \leq P(A) \leq 1$

Answer: C

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18. If a card is selected from a deck of 52 cards, then the probability of a being a red face card is

A. $\frac{3}{26}$

B. $\frac{3}{13}$

C. $\frac{2}{13}$

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

Answer: A

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19. The probability that a non-leap your selected at random will contain 53 Sunday is

A. $\frac{1}{7}$

B. $\frac{2}{7}$

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

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

Answer: A

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20. When a die is thrown, the probability of getting an odd number less than 3 is

A. $\frac{1}{6}$

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

C. $\frac{1}{2}$

D. 0

Answer: A

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21. A card is drawn from a dect of 52 cards. The event E is that card is not an ace of hearts. The number of outcomes favorable to E is

A. 4

B. 13

C. 48

D. 51

Answer: D

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22. The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs in the lot is

A. 7

B. 14

C. 21

D. 28

Answer: B

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23. A girl calculates that the probability of her winning the ifrst prize in a lottery is 0.08. If 6000 tickets are sold, then how many tickets has she bought?

A. 40

B. 240

C. 480

D. 750

Answer: C

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24. One ticket is drawn at random from a bag containing ticket numbered 1 to 40. The probability that the selected ticket has a number which is a multiple of 5 is.

A. $\frac{1}{5}$

B. $\frac{3}{5}$

C. $\frac{4}{5}$

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

Answer: A

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25. Someone is asked to take number from 1 to 100. The probablity that it is a prime, is

A. $\frac{1}{5}$

B. $\frac{6}{25}$

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

D. $\frac{13}{50}$

Answer: C

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26. A school has five houses A, B,C,D and E. A class has 23 students, 4 from houses A, 8 from house C, 2 from house D and rest from house E. A single student is selected at random to be the class monitor. The probability that the selected student is not from A, B and C is

A. $\frac{4}{23}$

B. $\frac{6}{23}$

C. $\frac{8}{23}$

D. $\frac{17}{23}$

Answer: B

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27. The medium of an ungrouped data and the median calculated when there same data is grouped are always the same. Do you think that this is a correct statement? Give reason.

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28. In Calculating the mean of grouped data, grouped in classes of equal width, we may use the formula

$$\bar{x} = a + \frac{\sum f_i d_i}{\sum f_i}$$

Where, a is the assumed mean, a must be one of the mid point of the classes. Is the last statement correct? Justify your answer.

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29. If a family having three children, there may be no girl, one girl, two girls or three girls. So, the probability of each is $\frac{1}{4}$. Is this correct? Justify your answer.

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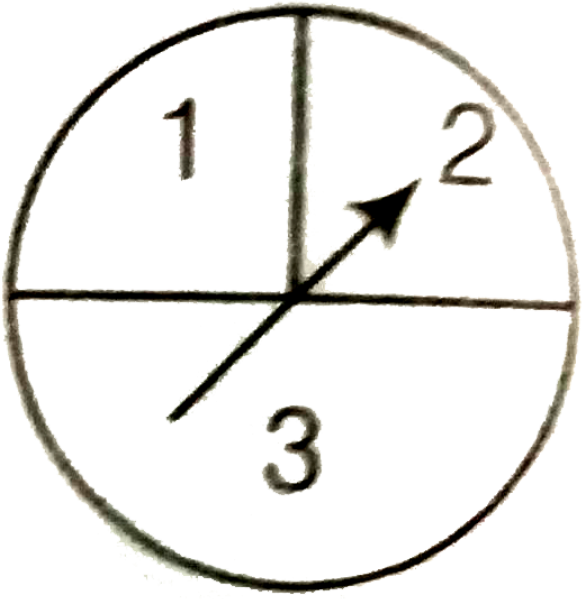
30. A game consists of spining an arrow which comes to rest pointing at one of regions (1,2 or 3) (see figure). Are the outcomes 1,2 and 3

equally likely to occur? Give reason



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31. Apoorv throws two dice once and computes the product of the numbers

appearing on the dice. Peehu throws one side one die and squares the number that appears on it. Who has the better chance of getting the number of 36? Why?

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32. When we toss a coin, there are two possible outcomes-heat or tail. Therefore, the probability of each outcome is $\frac{1}{2}$. Justify your answer.

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33. A student says that if you throw a die, it will show up 1 or not 1. Therefore, the probability of getting 1 and theprobability of getting not 1 each is equal to $\frac{1}{2}$. Is this correct? Give reasons.

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34. I toss three coins together. The possible outocmes are no heads, 1 head 2 head and 3

heads. So, I say that prbability of no heads is $\frac{1}{4}$. What is wrong with this conclusion?

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35. If you toss a coin 6 times it comes down head on each occasion Can you say that the probability of getting a head is 1? Give reasons

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36. Sushma tosses a coin 3 times and gets tail each time. Do you think that the outcome of next toss will be a tail? Give reasons.

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37. If I toss a coin 3 times and get head and get head each time, should I expect a tail to have a higher chance in the 4th toss? Give a reason in support of your answer.

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38. A bag contains slips numbered from 1 to 100. If Fatima chooses a slip at random from the bag, it will either be an odd number or an even number. Since, this situation has only two possible outcomes, so the probability of each is $\frac{1}{2}$. Justify

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39. Find the mean of the distibution

Class	1-3	3-5	5-7	7-10
Frequency	9	22	27	17

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40. Calculate the mean of the scores of 20 students in a mathematics test

Marks	10-20	20-30	30-40	40-50	50-60
Number of students	2	4	7	6	1

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41. Calculate the mean of the following data

Class	4-7	8-11	12-15	16-19
Frequency	5	4	9	10

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42. The following table gives the number of pages written by Saria for completing her own book for 30 days.

Number of pages written per day	16-18	19-21	22-24	25-27	28-30
Number of days	1	3	4	9	13

Find the mean number of pages written per day.

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43. The daily income of a sample of 50 employees are tabulated as follows.

Income (in ₹)	1-200	201-400	401-600	601-800
Number of employees	14	15	14	7

Find the mean daily income of employees.

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44. An aircraft has 120 passsenger seats. The number of seats occupied during 100 flights is

given in the following table.

Number of seats	100-104	104-108	108-112	112-116	116-120
Frequency	15	20	32	18	15

Determine the mean number of seats occupied over the flights.

A. 105.78

B. 101.08

C. 110.20

D. 109.92

Answer: D

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45. The weights (in kg) of 50 wrestlers are recorded in the following table.

Weight (in kg)	100-110	110-120	120-130	130-140	140-150
Number of wrestlers	4	14	21	8	3

Find the mean weight of the wrestlers.

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46. The mileage (km per litre) of 50 cars of the same model was tested by a manufacture and details are tabulated as given below

Mileage (kmL^{-1})	10-12	12-14	14-16	16-18
Number of cars	7	12	18	13

Find the mean mileage. The manufacture claimed that the mileage of the model was 16 kmL. Do you agree with this claim?

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47. The following is the distribution of weights (in kg) of 40 persons.

Weight (in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
Number of persons	4	4	13	5	6	5	2	1

Construct a cumulative frequency distribution

(of the less than type) table for the data above.

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48. The following table show tha cumulative frequency distribution of marks of 800 students in an examination.

Marks	Number of students
Below 10	10
Below 20	50
Below 30	130
Below 40	270
Below 50	440
Below 60	570
Below 70	670
Below 80	740
Below 90	780
Below 100	800

Construct a frequency distribution table for the data above.

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49. From the frequency distribution table from the following data

Marks (Out of 90)	**Number of candidates**
More than or equal to 80	4
More than or equal to 70	6
More than or equal to 60	11
More than or equal to 50	17
More than or equal to 40	23
More than or equal to 30	27
More than or equal to 20	30
More than or equal to 10	32
More than or equal to 0	34

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50. Find the unknown entries a,b,c,d,e and f in the following distribution of heights of

students in a class

Height (in cm)	**Frequency**	**Cumulative frequency**
150-155	12	*a*
155-160	*b*	25
160-165	10	*c*
165-170	*d*	43
170-175	*e*	48
175-180	2	*f*
Total	50	

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51. The following are the ages of 300 patients getting medical treatment in a hospital on a particulat day

Age (in year)	10-20	20-30	30-40	40-50	50-60	60-70
Number of patients	60	42	55	70	53	20

Form

(i) Less than type cumulative frequency distribution.

(ii) More than type cumulative frequency distribution.

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52. Given below is a cumulative frequency distribution showing the mars secured by 50 students of a class

Marks	Below 20	Below 40	Below 60	Below 80	Below 100
Number of students	17	22	29	37	50

From the frequency distribution table for the data.

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53. Weekly income of 600 families is tabulted below.

Weekly income (in ₹)	Number of families
0-1000	250
1000-2000	190
2000-3000	100
3000-4000	40
4000-5000	15
5000-6000	5
Total	600

Compute the median income.

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54. The maximum bowling speeds, in km per hour, of 33 players at a cricket coaching centre are given as follows.

Speed (in km/h)	85-100	100-115	115-130	130-145
Number of players	11	9	8	5

Calculate the median bowling speed.

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55. The monthly income of 100 families are given as below

Income (in ₹)	Number of families
0-5000	8
5000-10000	26
10000-15000	41
15000-20000	16
20000-25000	3
25000-30000	3
30000-35000	2
35000-40000	1

Calculate the modal income.

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56. The weights of coffee im 70 packets are shown in the following table

Weight (in g)	**Number of packets**
200-201	12
201-202	26
202-203	20
203-204	9
204-205	2
205-206	1

Determine the modal weight.

A. 201.4g

B. 201.7g

C. 201.5g

D. 201.6g

Answer: B

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57. Two dice are thrown at the same time. Find the probability of getting

(i) Same number on both dice.

(ii) different number of both dice.

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58. Two dice are thrown simultaneously. What is the probability that the sum of the number appearing on the dice is

(i) 7? (ii) a prime number? (iii) 1?

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59. Two dice are thrown together. Find the probability that the product the number ont the top of the dice is

(i) 6 (ii) 12 (iii) 7

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60. Two dice are thrown at the same time and the product of numbers appearing on them is noted. Find the probability that the product is less than 9.

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61. Two dice are numbered 1,2,3,4,5,6 and 1,1,2,2,3,3, resepectively. They are thrown and the sum of the number is noted. Find the

probability of getting each sum from 2 to 9, seperately.

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62. A coin is tossed two times. Find the probaility of getting atmost one head.

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63. A coin is tossed 3 times. List the possible outcomes. Find the probability of getting

(i) all heads (ii) atleast 2 heads

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64. Two dice are thrown at the same time. Determine the probability that the difference of the number on the two dice is 2.

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65. A bag contains 10 red 5 blue and 7 green balls. A ball is drawn at random. Find the

probability of this ball being a

(i) red ball (ii) green ball (iii) not a blue ball

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66. The king, queen and jack of clubs are removed from a deck of 52 playing cards and the remaining cards are shuffled. A card is drawn from the remaining cards. Find the probability of getting a card of (i) heart (ii) queen (iii) clubs.

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67. Refer to 0.28. What is the probablity that the card is

(i) a club (ii) 10 of hearts

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68. All the jacks, queens and kings are removed from a deck of 52 playing cards. The remaining cards as well shuffled and then one card is drawn at random. Giving ace a value 1 similar value for other fards, find the probability that

the card has a value.

(i) 7 (ii) Greater than 7

(iii) less than 7

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69. An integer is chosen between 0 and 100. What is the probability that it is

(i) divisible by 7 (ii) not divisible by 7?

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70. Cards with number 2 to 101 are placed in a box. A card is selected at random. Find the probability that the card has

(i) an even number (ii) a square number

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71. A letter of English alphabet is chosen at random. Determine the probability that the chosen letter is a consonant.

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72. There are 100 sealed envelops in a box, 10 of them contain a cash prize of 100 each, 100 of them contain a cash prize of 50 each and 200 of them contain a cash prize of 10 each and rst do not contin any cash prize. If they are well shuffled and an evelope is picket up out, What is the probabiilty that it contains no cash prize?

73. Box A contains 25 slips of which 19 are marked 1 and other are marked 5 each. Box B contains 50 slips of which 45 are marked 1 each and other are market 13 each. Slips of both boxes are poured into a third box and resuffled. A slip is drawn at random. What is the probability that it is marked other than 1?

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74. A carton of 24 bulbs contain 6 defactive bulbs. One but is drawn at random. What is the probability that the bulbs is not defactive? If the bulb selected is defective nad it is not replaced and a second bulb ius selected at random from the rest, what is the probability that the second bulb is defactive?

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75. A child's game has 8 triangle of which 3 are blue and rest are red, and 10 square of which 6 are blue and rest are red. One piece is lost at random. Find the probability that it is a

(i) trinagle (ii) square

(iii) square of blue colour

(iv) triangle of red colour

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76. In a game, the entry fee is of 5. The game consists of a tossing a coin 3 times. If one or two heads show. Sweta gets her entry fee back. If she throw 3 heads, she receives double the entry fees. Otherwise, she will lose. For tossing a coint three times, Find the probability that she

(i) Loses the entry fee.

(ii) gets double entry fee.

(iii) just gets her entry fee.

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77. A die its six faces marked 0,1,1,1,6,6. Two such dice are thrown together and the total is recorded.

(i) How many different scores are responsible

(ii) What is the probability

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78. A lot consists of 48 mobile phones of which 42 are good, 3 have only minor defected and 3 have major defects. Varnika will but a phone if

its is good but the trader will only buy a mobile, if it has no major defect. One phone is selected at random from the lot. What is the probability that t is

(i) accetable to Varnika?

(ii) acceptable to the trader.

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79. A bag contains 24 balls of which x are red, 2x are hwite and 3x are blue. A ball is selected

at random. What is the probability that it is

(i) not red? (ii) white

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80. At a fete, cards bearing number 1 to 1000, one number on one card,are put in a box. Each player selects one card at random and that card is not replaced. If the selected card has a perfect square greater than 500, the player wins a prize. What is probability that

(i) the first player winz a price?

(ii) the second player wins a prize, if the first has won?

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81. Find the mean of the students for the following distribution

Marks	Number of students
0 and above	80
10 and above	77
20 and above	72
30 and above	65
40 and above	55
50 and above	43
60 and above	28
70 and above	16
80 and above	10
90 and above	8
100 and above	0

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82. Determine the mean of the following distribution

Marks	Number of students
Below 10	5
Below 20	9
Below 30	17
Below 40	29
Below 50	45
Below 60	60
Below 70	70
Below 80	78
Below 90	83
Below 100	85

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83. Find the mean age of 100 resisdents of a town from the following data.

Age equal and above (in years)	0	10	20	30	40	50	60	70
Number of persons	100	90	75	50	25	15	5	0

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84. The weight of tea in 70 packets are shown in the following table

Weight (in g)	Number of packets
200-201	13
201-202	27
202-203	18
203-204	10
204-205	1
205-206	1

Find the mean weight of packets.

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85. The table below shows the saleries of 280 persons.

Salary (in ₹ thousand)	Number of persons
5-10	49
10-15	133
15-20	63
20-25	15
25-30	6
30-35	7
35-40	4
40-45	2
45-50	1

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86. The mean of the following distribution is 50 but the frequency f_1 and f_2 in classes 20-40 and 60-80, resepectively are not known. Find these frequencies, if the sum of all the

fequencies is 120

Class	0-20	20-40	40-60	60-80	80-100
Frequency	17	f_1	32	f_2	19

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87. The median of the following data is 50. Find the values of p and q, if the sum of the all the

frequencies is 90.

Marks	Frequency
20-30	p
30-40	15
40-50	25
50-60	20
60-70	q
70-80	8
80-90	10

A. $p = 5\, q = 7$

B. $p = 2\, q = 6$

C. $p = 3\, q = 5$

D. $p = 5\, q = 8$

Answer: A

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88. Size of agricultural holding in a survey of 200 families is given in the following table.

Size of agricultural holdings (in hec)	**Number of families**
0-5	10
5-10	15
10-15	30
15-20	80
20-25	40
25-30	20
30-35	5

Cumpute median and mode size of the holdings.

A. Median = 15.81 Mode = 18.77

B. Median = 13.41 Mode = 15.27

C. Median = 17.81 Mode = 17.77

D. Median = 12.41 Mode = 16.27

Answer: C

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89. 50 students enter for a school javeloin throw competition. The distance (in metre) thrown are recorded below

Distance (in m)	0-20	20-40	40-60	60-80	80-100
Number of students	6	11	17	12	4

(i) Construct a cumulative frequency table.

(ii)Calculate the median distance by using the formula for median.

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Very Short Answers Questions

1. It is true to say that the mean, mode and median of grouped data always be different? Justify your answer.

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2. Will the median class and modal class of grouped data always by different? Justify your answer.

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Long Aswers Questions

1. Refer to 0.4 above. Draw the less then type ogive for this data and use it to find the median weight.

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2. Refer to 0.5 above. Draw the less then type ogive for this data and use it to find the median weight.

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3. The distribution of heights (in cm) of 96 children is given below

Height (in cm)	**Number of children**
124-128	5
128-132	8
132-136	17
136-140	24
140-144	16
144-148	12
148-152	6
152-156	4
156-160	3
160-164	1

Draw a less type cumulative frequencies curve fo this data and use it to compute meidan height of the children.

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4. The annual rainful recored of a city for 66 day is given in the following table

Rainfall (in cm)	0-10	10-20	20-30	30-40	40-50	50-60
Number of days	22	10	8	15	5	6

Calculate the following median rainfall using ogives (or move than type and of less than type)

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5. The following is the frequency distribution of duration for 100 calls made on the mobile phone

Duration (in s)	**Number of calls**
95-125	14
125-155	22
155-185	28
185-215	21
215-245	15

Calculate the average duration (in sec) of a call and also find the median from a cumulative frequency curve.

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