


CHAPTER-14
STATISTICS
04 MARK TYPE QUESTIONS

Q. NO	QUESTION	MARK														
1.	<p>A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is</p> <p>(i) A card of spade or an ace. (ii) A black king. (iii) Neither a jack nor a king (iv) Either a king or a queen.</p>	4														
2.	<p>Cards on which numbers 1, 2, 3, 4, -----100 are written (one number on one card and no number is repeated) and put in a bag and are mixed thoroughly. A card is drawn at random from the bag, find the probability that card taken out has:</p> <p>(i) An even number (ii) A number which is a multiple of 13. (iii) A perfect square number (iv) A prime number less than 20.</p>	4														
3.	<p>Formula one Portuguese Grand Prix technical team at the Algarve International Circuit are analysing last year data of drivers’ performance to provide valuable inferences to commentators on how the drivers can improve this year. The length of time taken by 80 drivers to complete a journey is given in the table below: Times (in minutes)</p> <table><tr><td>Times (in minutes)</td><td>70-80</td><td>80-90</td><td>90-100</td><td>100-110</td><td>110-120</td><td>120-130</td></tr><tr><td>Number of drivers</td><td>4</td><td>10</td><td>14</td><td>20</td><td>24</td><td>8</td></tr></table> <p>(i) What is the estimate of the mean time (in minutes) taken to complete the journey (a) 105 (b) 94 (c) 101 (d) 112 (ii) In which interval does the median of the distribution lie? (a) 80-90 (b) 90-100 (c) 100-110 (d) 110-120 (iii)In which interval does the mode of the distribution lie? (a) 80-90 (b) 90-100 (c) 100-110 (d) 110-120 (iv) What is the model time taken to complete journey ? (a) 112 (b) 118 (c) 101 (d) 108</p>	Times (in minutes)	70-80	80-90	90-100	100-110	110-120	120-130	Number of drivers	4	10	14	20	24	8	
Times (in minutes)	70-80	80-90	90-100	100-110	110-120	120-130										
Number of drivers	4	10	14	20	24	8										
4.	<p>Apples are most widely planted and are commercially the most important fruit crop in Jammu and Kashmir. The cultivation of apple crop in Jammu and Kashmir shows particular interest for a number of reasons. In terms of both area and production, apple is very beneficial fruit crop. This provides a major source of income and employment in Jammu and Kashmir. Horticultural department has tasked their statistical officer to create a model for farmers to be able to predict their produce output based on various factors. A box containing 250 apples was opened and each apple was weighed. The distribution of the masses of the apples is given in the following table:</p> <table><tr><td>Mass (in grams)</td><td>80-100</td><td>100-120</td><td>120-140</td><td>140-160</td><td>160-180</td></tr><tr><td>Frequency</td><td>20</td><td>60</td><td>70</td><td>x</td><td>60</td></tr></table>	Mass (in grams)	80-100	100-120	120-140	140-160	160-180	Frequency	20	60	70	x	60			
Mass (in grams)	80-100	100-120	120-140	140-160	160-180											
Frequency	20	60	70	x	60											

	<p>(i) How many apples are in the range 140-160 mass? (a) 40 (b) 50 (c) 60 (d) 70</p> <p>(ii) What is the mean mass of the apples? (a) 131 grams (b) 135 grams (c) 150 grams (d) 156 grams</p> <p>(iii) What is the upper limit of the median class? (a) 80 (b) 100 (c) 120 (d) 140</p> <p>(iv) What is the modal mass of the apples? (a) 122 grams (b) 125 grams (c) 128 grams (d) 132 grams</p>											
5.	<div></div> <p>An electric scooter manufacturing company wants to declare the mileage of their electric scooters. For this, they recorded the mileage (km/charge) of 50 scooters of the same model. Details of which are given in the following table. Based on the above information, answer the following questions.</p> <table><tr><td>Mileage (km/charge)</td><td>100 - 120</td><td>120 - 140</td><td>140 - 160</td><td>160 - 180</td></tr><tr><td>Number of scooters</td><td>7</td><td>12</td><td>18</td><td>13</td></tr></table> <p>(i) The average mileage is (a) 140 km/charge (b) 150 km/charge (c) 130 km/charge (d) 144.8 km/charge</p> <p>(ii) The modal value of the given data is (a) 150 (b) 150.91 (c) 145.6 (d) 140.9</p> <p>(iii) The median value of the given data is (a) 140 (b) 146.67 (c) 130 (d) 136.6</p> <p>(iv) The manufacturer can claim that the mileage for his scooter is (a) 144 km/charge (b) 155 km/charge (c) 165 km/charge (d) 175 km/charge</p>	Mileage (km/charge)	100 - 120	120 - 140	140 - 160	160 - 180	Number of scooters	7	12	18	13	4
Mileage (km/charge)	100 - 120	120 - 140	140 - 160	160 - 180								
Number of scooters	7	12	18	13								
6.	<p>An inspector in an enforcement squad of electricity department visit to a locality of 100 families and record their monthly consumption of electricity, on the basis of family members, electronic items in the house and wastage of electricity, which is summarise in the following table.</p> <table><tr><td>Monthly consumption in kwh</td><td>No. of families</td></tr></table>	Monthly consumption in kwh	No. of families	4								
Monthly consumption in kwh	No. of families											

0-100	2
100-200	5
200-300	X
300-400	12
400-500	17
500-600	20
600-700	Y
700-800	9
800-900	7
900-1000	4

Based on the above information, answer the following questions.

(i) The value of $x + y$ is

(a) 100 (b) 42 (c) 24 (d) 200

(ii) If the median of the above data is 525, then x is equal to

(a) 10 (b) 8 (c) 9 (d) none of these

(iii) What will be the upper limit of the modal class?

(a) 400 (c) 650 (b) 600 (d) 700

(iv) The average monthly consumption of a family of this locality is approximately

(a) 520 kwh (b) 522 kwh (c) 540 kwh (d) none of these

7.

4

Marks	No. of students
0-10	12
10-20	16
20-30	21

30-40	13
40-50	18

Mr Avinash is a Maths teacher who is working in some school. In his class X, total 80 students are there. He decided to teach them as per their capabilities. So, he conducted one revision test on the basis of class IX result. The maximum marks were 50. There were 12 students who scored less than 10 marks. Shruthi who got 3 marks was handed over a red card as an intimation to work hard for one month and show improvement, as she scored the least in the class. Anish was presented a badge of honour for scoring the highest in the class. He scored 48 marks. Best performer badge given to Anish. Mr Avinash prepared a frequency distribution table for the data of the marks obtained by the students in the revision test as follows:



(a) Find the lower limit of modal class of the frequency distribution table prepared by Mr Avinash

- (i) 10 (ii) 20 (iii) 30 (iv) 40

(b) Find the median class of the distribution.

- (i) 10–20 (ii) 20–30 (iii) 30–40 (iv) 40–50

(c) Find the mean marks obtained by the students.

- (i) 23.25 (ii) 24.25 (iii) 26.125 (iv) 31.375

(d) Find the range of the marks obtained by the students.

- (i) 31 (ii) 37.25 (iii) 41.25 (iv) 45

8. An agency has decided to install customised playground equipments at various colony parks. For that they decided to study the age-group of children playing in a park of the particular colony. "The classification of children according to their ages, playing in a park is shown in the following table.

Age group of children	Number of children
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4

(in years)	
6-8	43
8-10	70
10-12	58
12-14	42
14-16	27

Based on the above information, answer the following questions (i) The maximum number of children are of the age-group

(a) 12-14

(b) 10-12

(c) 14-16

(d) 8-10

(d) 6- 8

ii) The lower limit of the modal class is

a)10 b) 12 c)14 d)NONE

(iii) Frequency of the class succeeding the modal class is

(a) 58 (b) 70 (c) 42 (d) 27

(iv) If mean and mode of the ages of children playing in the park are same, then median will be equal to

(a) Mean

(b) Mode

(c) Both (a) and (b)

	(d) Neither (a) nor (b)																			
9.	<p>The given distribution shows the number of runs scored by some top batsmen of the world in one day international cricket matches.</p> <table><tr><th>Runs Scored</th><th>No. of Batsman</th></tr><tr><td>3000-4000</td><td>4</td></tr><tr><td>4000-5000</td><td>18</td></tr><tr><td>5000-6000</td><td>9</td></tr><tr><td>6000-7000</td><td>7</td></tr><tr><td>7000-8000</td><td>6</td></tr><tr><td>8000-9000</td><td>3</td></tr><tr><td>9000-10000</td><td>1</td></tr><tr><td>10000-11000</td><td>1</td></tr></table> <p>Find the mode of the data.</p>	Runs Scored	No. of Batsman	3000-4000	4	4000-5000	18	5000-6000	9	6000-7000	7	7000-8000	6	8000-9000	3	9000-10000	1	10000-11000	1	4
Runs Scored	No. of Batsman																			
3000-4000	4																			
4000-5000	18																			
5000-6000	9																			
6000-7000	7																			
7000-8000	6																			
8000-9000	3																			
9000-10000	1																			
10000-11000	1																			
10.	<p>The mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50. Compute the missing frequencies f_1 and f_2:</p> <table><tr><td>class</td><td>0-20</td><td>20-40</td><td>40-60</td><td>60-80</td><td>80-100</td><td>100-120</td><td>total</td></tr><tr><td>frequency</td><td>5</td><td>f_1</td><td>10</td><td>f_2</td><td>7</td><td>8</td><td>50</td></tr></table>	class	0-20	20-40	40-60	60-80	80-100	100-120	total	frequency	5	f_1	10	f_2	7	8	50	4		
class	0-20	20-40	40-60	60-80	80-100	100-120	total													
frequency	5	f_1	10	f_2	7	8	50													
11.	<p>CASE –BASED :</p> <p>During the annual sports meet in a school , all the athletes were very enthusiastic .They all wanted to be a winner so that their house could stand first. The instructor noted down the time taken by a group of students to complete a certain race .the data recorded is given below:</p> <table><tr><th>Time(in seconds)</th><th>No. of students</th></tr><tr><td>0-20</td><td>1</td></tr><tr><td>20-40</td><td>4</td></tr><tr><td>40-60</td><td>3</td></tr><tr><td>60-80</td><td>7</td></tr><tr><td>80-100</td><td>5</td></tr></table> <p>Based on the above information,give the answer of the following:</p> <p>(i) What is the class mark of the model class?</p> <p>(ii) Find the median class of the given data.</p> <p>(iii) Find the mode of the given data.</p>	Time(in seconds)	No. of students	0-20	1	20-40	4	40-60	3	60-80	7	80-100	5	4						
Time(in seconds)	No. of students																			
0-20	1																			
20-40	4																			
40-60	3																			
60-80	7																			
80-100	5																			
12.	<p>CASE-BASED:</p> <p>The COVID -19 pandemic ,is an ongoing pandemic of coronavirus disease caused by the</p>	4																		

transmission of severe acute respiratory syndrome coronavirus 2 among humans . The following tables show the age distribution of cases admitted during a day in two different hospitals :

Table-1

Age(in years)	No.of cases
5-15	6
15-25	11
25-35	21
35-45	23
45-55	14
55-65	5

Table-2

Age(in years)	No.of cases
5-15	8
15-25	16
25-35	10
35-45	42
45-55	24
55-65	12

Observe the table-1 and give the answer of the following:

- (i) Find the average age for which maximum cases occurred.
- (ii) Find the upper limit of the modal class.

Observe the table -2 and give the answer:

- (iii) Find the mode of the given data.

13. Under the physical and health education a medical check up program was conducted in a Vidyalaya to improve the health and fitness conditions of the students. Reading of the heights of 50 students was obtained as given in the table below:



Height (in cm)	Number of students
135 – 140	2
140 – 145	8
145 – 150	10
150 – 155	15
155 – 160	6

160 – 165
165 – 170

5
4

- Find the lower class limit of the modal class
- Find the median class
- Find the assumed mean of the data

14. **COVID-19** Pandemic The COVID-19 pandemic, also known as coronavirus pandemic, is an ongoing pandemic of coronavirus disease caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among humans.



The following age distribution of case admitted during a day in two different hospitals

Table 1

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	6	11	21	23	14	5

Table 2

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	8	16	10	42	24	12

Refer to table 1

- Find the average age for which maximum cases occurred .
- Find the upper limit of modal class.

Refer to table 2

- Find the median of the given data .

ANSWERS:

Q. NO	ANSWER	MARKS																																				
1.	(i) 4/13 (ii) 1/52 (iii) 11/13 (iv) 2/13	4																																				
2.	The total no. of possible outcomes= 100 (i) No. of even numbers from 1 to 100 = 50 ∴ P (A even number) = 50/100= ½ (ii) Multiples of 13 from 1 to 100 are 13, 26, 39, 52, 65, 78 and 91 No. of favourable Outcomes = 7 ∴ P (multiple of 13)= 7/100 (iii) Perfect square no, from 1 to 100 are 1, 4, 9, 16, 25, 36, 49, 64, 81 and 100 No. of favourable outcomes = 10 ∴ P (perfect square number) = 10/100=1/10 (iv) Prime numbers less than 20 are 2, 3, 5, 7, 11, 13, 17 and 19 No. of favourable outcomes = 8 ∴ P (A prime number less than 20) = 8/100= 2/25.	4																																				
3.	(i)a is correct option (ii) c is correct option. (iii) Class 110-120 has the maximum frequency 24, therefore this is model class. (d) is correct option. (iv) Here, l = 110, f1 = 24, f0 = 20, f2 = 8 and h = 10 (d) is correct option	4																																				
4.	(I)Ans : 20 +++ 60 70 x + 60 = 250 210 + x = 250 x = 250 – 210 = 40Thus (a) is correct option (II) (b) is correct option. <table><tr><td>Mass</td><td>f</td><td>c.f.</td><td>x_i</td><td>f_i x_i</td></tr><tr><td>80-100</td><td>20</td><td>20</td><td>90</td><td>1800</td></tr><tr><td>100-120</td><td>60</td><td>80</td><td>110</td><td>6600</td></tr><tr><td>120-140</td><td>70</td><td>150</td><td>130</td><td>9100</td></tr><tr><td>140-160</td><td>40</td><td>190</td><td>150</td><td>6000</td></tr><tr><td>160-180</td><td>60</td><td>250</td><td>170</td><td>10200</td></tr><tr><td></td><td>Σ f_i = 250</td><td></td><td></td><td>Σ f_i x_i = 33700</td></tr></table> <p>(III) Cumulative frequency just greater than N/2=250/2=125 is 150 the corresponding class is 120-140. median class is 120-140 and upper 140. Thus (d) is correct option. (IV) Class 120-140 has the maximum frequency 70, therefore this is model class. Here, l = 120, f1 = 70, f0 = 60, f2 = 60 and h = 20, Thus (b) is correct option.</p>	Mass	f	c.f.	x _i	f _i x _i	80-100	20	20	90	1800	100-120	60	80	110	6600	120-140	70	150	130	9100	140-160	40	190	150	6000	160-180	60	250	170	10200		Σ f _i = 250			Σ f _i x _i = 33700	4	
Mass	f	c.f.	x _i	f _i x _i																																		
80-100	20	20	90	1800																																		
100-120	60	80	110	6600																																		
120-140	70	150	130	9100																																		
140-160	40	190	150	6000																																		
160-180	60	250	170	10200																																		
	Σ f _i = 250			Σ f _i x _i = 33700																																		
5.	i)d ii)b iii)b iv)a	4																																				
6.	We have the following table: <table><tr><th>Class interval</th><th>Frequency</th><th>Cumulative frequency</th></tr><tr><td>0-100</td><td>2</td><td>2</td></tr><tr><td>100-200</td><td>5</td><td>7</td></tr><tr><td>200-300</td><td>x</td><td>7+ x</td></tr><tr><td>300-400</td><td>12</td><td>19 + x</td></tr><tr><td>400-500</td><td>17</td><td>36 + x</td></tr><tr><td>500-600</td><td>20</td><td>56 + x</td></tr><tr><td>600-700</td><td>y</td><td>56 + x + y</td></tr><tr><td>700-800</td><td>9</td><td>65 + x + y</td></tr><tr><td>800-900</td><td>7</td><td>72 + x + y</td></tr><tr><td>900-1000</td><td>4</td><td>76 + x + y</td></tr><tr><td>Total</td><td>76 + x + y</td><td></td></tr></table>	Class interval	Frequency	Cumulative frequency	0-100	2	2	100-200	5	7	200-300	x	7+ x	300-400	12	19 + x	400-500	17	36 + x	500-600	20	56 + x	600-700	y	56 + x + y	700-800	9	65 + x + y	800-900	7	72 + x + y	900-1000	4	76 + x + y	Total	76 + x + y		4
Class interval	Frequency	Cumulative frequency																																				
0-100	2	2																																				
100-200	5	7																																				
200-300	x	7+ x																																				
300-400	12	19 + x																																				
400-500	17	36 + x																																				
500-600	20	56 + x																																				
600-700	y	56 + x + y																																				
700-800	9	65 + x + y																																				
800-900	7	72 + x + y																																				
900-1000	4	76 + x + y																																				
Total	76 + x + y																																					

	<p>(i) (c): Here, it is given that total frequency = 100 $\therefore 76 + x + y = 100 \Rightarrow x + y = 24$</p> <p>(ii) (c)</p> <p>(iii) (b) Since, maximum frequency is 20, so modal class is 500 - 600. Hence, upper limit of modal class is 600</p> <p>(iv) (b) : Since, $x + y = 24 \Rightarrow y = 24 - 9 = 15$ Required average consumption= $\frac{50 \times 2 + 150 \times 5 + 250 \times 9 + 350 \times 12 + 450 \times 17 + 550 \times 20 + 650 \times 15 + 750 \times 9 + 850 \times 7 + 950 \times 4}{100}$ $= \frac{52200}{100} = 522\text{kwh}$</p>																																	
7.	<p>a) ii) 20 b) ii) 20-30 c) iii) 26.125 d) iv) 45</p>	4																																
8.	<p>i)(b):Since, the highest frequency is 70, therefore the maximum number of children are of the age-group 10-12 (ii) (a): Since, the modal class is 10-12 Lower limit of modal class is10 iii) c) Here,$f-58.f$, 70 and f, 42 Thus, the frequency of the class succeeding the modal class is 42 iv)(c)Given that, Mean= Mode, So By Empirical relation, we have Mode =3 Median - 2 Mean Mode =3 Median-2 Mode 3 Mode=3 Median Median =Mode =Mean</p>	4																																
9.	4608.7 runs	4																																
10.	By using direct method to find mean. We get $f_1+f_2=20$ and $3f_1+7f_2=108$ After solve $f_1=8$ and $f_2=12$	4																																
11.	<p>(i) 60-80 (ii) 60-80 (iii) Mode = $l + [(f_1-f_0)/(2f_1 -f_0 -f_2)] \times h$ $=60+[(7-3)/(14-3-5)]\times20$ $=60+(4/6) \times20 =60+13.3=73.3$</p>	4																																
12.	<table><tr><td>Age (in years)</td><td>x_i</td><td>f_i</td><td>$x_i f_i$</td></tr><tr><td>5-15</td><td>10</td><td>6</td><td>60</td></tr><tr><td>15-25</td><td>20</td><td>11</td><td>220</td></tr><tr><td>25-35</td><td>30</td><td>21</td><td>630</td></tr><tr><td>35-45</td><td>40</td><td>23</td><td>920</td></tr><tr><td>45-55</td><td>50</td><td>14</td><td>700</td></tr><tr><td>55-65</td><td>60</td><td>5</td><td>300</td></tr><tr><td>Total</td><td></td><td>$\Sigma f_i =80$</td><td>$\Sigma f_i f_i =2830$</td></tr></table>	Age (in years)	x_i	f_i	$x_i f_i$	5-15	10	6	60	15-25	20	11	220	25-35	30	21	630	35-45	40	23	920	45-55	50	14	700	55-65	60	5	300	Total		$\Sigma f_i =80$	$\Sigma f_i f_i =2830$	4
Age (in years)	x_i	f_i	$x_i f_i$																															
5-15	10	6	60																															
15-25	20	11	220																															
25-35	30	21	630																															
35-45	40	23	920																															
45-55	50	14	700																															
55-65	60	5	300																															
Total		$\Sigma f_i =80$	$\Sigma f_i f_i =2830$																															

	Mean= $\Sigma x_i f_i / \Sigma f_i$ = $2830/80 = 35.38$ (ii) Modal class=35-45, Upper limit-45 (iii) For table-2 Modal class= 35-45 Mode = $l + [(f_1 - f_0) / (2f_1 - f_0 - f_2)] \times h$ = $35 + 10(42-10) / (2 \times 42 - 10 - 24)$ = $35 + 320/50 = 35 + 6.4 = 41.4$	
13.	(a) 150 (b) 150-155 (c) 190.13	4
14.	(a) 36.5 (b) 45 (c) 40.23	4