<u>CHAPTER 18</u> MEAN , MEDIAN AND MODE OF UNGROUPED DATA

Exercise 18A

Answer1.

(i) The first eight natural numbers 0,1,2,3,4,5,6,7,8

$$\frac{(0+1+2+3+4+5+6+7+8)}{8} = \frac{36}{8} = 4.5$$

(ii) The first ten odd numbers 1,3, 5, 7, 9, 11,13,17, 19, 21

$$\frac{(1+3+5+7+9+11+13+15+17+19)}{10} = \frac{100}{10} = 10$$

(iii) The first seven multiples of 5 -- 5,10,15,20,25,30,35

$$\frac{(5+10+15+20+25+30+35)}{7} = \frac{140}{7} = 20$$

(iv) All the factors of 20 - 1,2,4,5,10, 20

$$\frac{(1+2+4+5+10+20)}{6} = \frac{42}{6} = 7$$

(v) All prime numbers between 50 and 80

There are only two 53,59,61,67,71,73,79

$$\frac{(53+59+61+67+71+73+79)}{7} = \frac{463}{7} = 66\frac{1}{7}$$

Answer2

Given , 10 families of a locality are 2,4,3,4,2,0,3,5,1,6

$$\frac{(2+4+3+4+2+0+3+5+1+6)}{10} = 3$$

Answer3 The numbers of books

$$\frac{105+216+322+167+273+405+346}{7} = \frac{1834}{7} = 262$$
The mean is 262
Answer4
The daily temperature then mean ,
$$\frac{35.5+30.8+27.3+32.1+23.8+29.9}{6} = \frac{179.4}{6} = 29.9$$
The mean is 29.9F
Answer5
Given , x, x+2, x+4, x+6 , x+8 is 13
So,
$$\frac{x+x+2+x+4+x+6+x+8}{5} = 13$$

$$\Rightarrow \frac{5x+20}{5} = 13$$

$$\Rightarrow 5x+20 = 65$$

$$\Rightarrow x = \frac{45}{5} = 9$$
Therefore, according to questions :-
Last three observation is = x+4 = 9+4 = 13
$$x+6=9+6=15$$

$$x+8=9+8=17$$
Hence,
$$\frac{(13+15+19)}{3} = \frac{47}{3} = 15$$

Answer6-Given , the mean weight of 6 boys is 48 Let the weight of 6^{th} boy be x

So, the weights of 6^{th} boy =

Acc to mean

$$\frac{51+45+49+46+44+x}{6} = 48$$
$$\Rightarrow 235+x = 288$$
$$\Rightarrow x = 288-235 = 53$$

So , the weight of 6th boy is 53kg.

Answer7:-Given , the mean of marks scored by 50 students = 39 So, calculated mean is

50 X 39 = 1950

So, the correct sum of these numbers = [1950 - (wrong item) + (right item)] = (1950 - 23 + 43) = 1970

Therefore, the correct mean =

$$\frac{1970}{50} = 39.4$$

Answer8

Given, the mean of 24 numbers will be 35 Acc to question ,

Let the given numbers be x1, x2, x3,.... x24. Then , the mean of these numbers =

$$\frac{x_{1+x_{2}+x_{3}+\dots+x_{2}4}}{24} = 35$$

Minch awa

x1 + x2 + x3.... + x24 = 35 X 24 = 840

the new numbers are (x1+3),(x2+3),(x3+3).....(x24+3)

mean of the new number

$$\frac{(x1+3) + (x2+3)\dots(x24+3)}{24}$$

$$\Rightarrow \frac{(x1+x2+\dots+x24) + 72}{24}$$

$$\Rightarrow \frac{840+72}{24} = \frac{912}{24} = 38$$

Answer9-

Let the given numbers be x1, x2, x3,..... x20 Then, mean of these numbers =

$$\frac{(x1+x2+\ldots+x20)}{20} = 43$$
$$(x1+x2+x3+\ldots+x20) = 860$$

And the new numbers will be (x1-6),(x2-6),(x3-6)......(x20-6)

Mean of new number =

$$\frac{(x1-6) + (x2-6) + (x3-6) + \dots + (x20-6)}{20}$$
$$\Rightarrow \frac{(x1+x2+x3+\dots + x20) - 120}{20}$$
$$\Rightarrow \frac{860 - 120}{20} = \frac{740}{20} = 37$$

Answer10-

Let the given numbers be x1, x2, x3,..... x15 Then, mean of these numbers =



And the new numbers will be (x1 X 4),(x2 X 4),(x3 X 4)......(x15 X 4)

Mean of new number =

$$\frac{(x1X4) + (x2X4) + \dots + (x15X4)}{15}$$

$$\Rightarrow \frac{(x1 + x2 + x3 + \dots + x15)X4}{15}$$

$$\Rightarrow \frac{(405X4)}{15} = 108$$

Answer11. Let the given no. be x1,x2,x3......x12 The mean of 12 numbers =

$$\frac{(x1+x2+x3+x4+\dots+x12)}{12} = 40$$

$$\Rightarrow x1+x2+x3+x4+\dots+x12 = 480\dots(i)$$

acc to question, the new mean is calculated by –

$$\frac{(x1/8) + (x2/8) + (x3/8) + \dots + (x12/8)}{12}$$
$$\Rightarrow \frac{(x1 + x2 + x3 + x4 + \dots + x12)/8}{12} = \frac{480/8}{12} = 5$$

Answer12 Let the given number be x1,x2,x3,x3,....x20 The mean of 20 numbers be =

$$\frac{(x1+x2+x3+....+x20)}{20} = 18$$

$$\Rightarrow x1+x2+x3+x4+....+x20 = 360$$

Let the new mean acc to question

$$\frac{[(x1+3)+(x2+3)+(x3+3).....x(x10+3)+(x11+x12+x13+....+x20)}{20}$$

$$\Rightarrow \frac{(20 \times 18)+(3 \times 10)}{20} = \frac{390}{20} = \frac{39}{2} = 19.5$$
Answer13.
Let the numbers be x1,x2,x3,x4,x5,x6
The mean of 6 no.s is
$$\frac{(x1+x2+x3+x4+x5+x6)}{6} = 23$$

$$\Rightarrow x1 + x2 + x3 + x4 + x6 = 23 \times 6 = 138$$
The new mean is
$$\frac{(x1+x2+x3+x4+x5)}{5} = 20$$

$$\Rightarrow x1 + x2 + x3 + x4 + x5 = 100$$
Acc to question the excluded no = 138.100
= 38
Answer14
Let the mean of 30 boys = 30 \times 150 = 4500
Acc to question -
The mean of correct height
$$(30 \times 150) - (wrong) + (correct)$$

$$= (30 \times 150) - 135 + 165$$

$$= 4530$$

So, the correct mean of 30 students will be

$$\frac{4530}{30} = 151$$

Answer15 Let the mean weight of 34 students = 46.5 X 34= 1581kg

The weight of (34 students + 1 teacher) = 46.5 + 0.5 = 47The mean weight of teacher & student = $47 \times 35 = 1645 \text{ kg}$

Acc to question, the weight of the teacher is

1645 - 1581 = 64kg

Answer16

Let mean weight of 36 students = 41 X 36 = 1476kg

The weight of student leave the class = (41-0.2)= 40.8kg

The mean weight now = 40.8 X 35 = 1428kg

Acc to question, the weight of the student

1476-1428=48kg

Answer17

Let mean of avg of weight = 39 X 40 = 1560

The weight of student after admitted into the class = 40-0.2= 39.8kg

The mean weight now = $39.8 \times 40 = 1592$

Acc to question, the weight of new student =

1592 - 1560 = 32kg

Answer18

The mean of weight = 10 X 1.5 = 15kg

Acc to question,

The weight calculated of new man = 15kg + 15kg = 73kg

Answer19

The mean of 8 nos = 35

Sum of these 8 nos = (35 X 8) = 280

Mean of remaining 7 no.s be = 35-3= 32

Sum of these 7 nos = $32 \times 7 = 224$

Therefore,

The excluded no.s = 280-224 = 56

Answer20

The mean of 150 items is 60

Sum of these no.s = $60 \times 150 = 9000$

The correct mean = [9000- {(wrong1)+(correct1) - (wrong2) +(correct2)}

= 9000 -52-8+152+88

= 9180

So. The correct mean =

$$\frac{9180}{150} = 61.2$$

Answer21

The sum value of 31 = 31 X 60 = 1860

Acc to question,

The sum of first 16^{th} no = 58 X 16 = 928

The sum of last 16^{th} nos = 62 X 16 = 992

Acc to question,

the 16th result = (992+928) - 1860

= 60

= 1920 - 1860

Answer22

The sum value of 11 = 11 X 42 = 462

Acc to question,

The sum of first 6 mean = $6 \times 37 = 222$

The sum of last 6 mean = $6 \times 46 = 276$

Acc to question,

The 6th number

(222 + 276) - 462=498-462= 36

Answer23

The sum value of 25 students = $25 \times 52 = 1300$

The mean weight of first 13 students = 48 kg

So, the sum value will be 48 X 13 = 624 The mean weight of last 13 students = 55kg So, the sum value will be 55 X 13 = 715

Acc to question,

The weight of 13th students =

$$(624 + 715) - 1300$$
$$= 1339 - 1300$$
$$= 39$$

Answer24 The mean of 25 observation = 80 The sum of value 25 X 80 = 2000

The mean value of another 55 observation = 60The sum of value $60 \times 55 = 3300$

Acc to question, The sum value of whole set = 2000+3300 = 5300 And the number of observation = 25+55 = 80

The mean will be

 $\frac{5300}{80} = 66.25$

Answer25 Let arun score no.s of marks in different subject is 36 , 44, 75, x. Acc to question,

The average of marks

 $\frac{36+44+75+x}{4} = 50$ $\Rightarrow 155+x = 200$ $\Rightarrow x = 200-155 = 45$

Answer26

Let the distance of one side journey is covered by be xkm. Then, the total distances will be = 2xkm. Given, the ship sail out 15km/hr and sail back to starting point 10km/hr.

Total time =

$$\left(\frac{x}{15} + \frac{x}{10}\right) = \frac{5x}{30} = \frac{x}{6}hr$$

So, avg speed =

$$\frac{2x}{(x/6)} km/hr$$
$$= 12km/hr$$

Answer27 The sum of 50 students avg weight of $44 = 50 \times 44 = 2200$ The sum girls 10 students avg weight of 40 = 400

Acc to question, Let the avg sum of 40 boys weight =

2200 - 400 $\Rightarrow 1800$ $\Rightarrow \frac{1800}{40} = 45$

Answer28 Acc to question, Monthly expenditure of the family = $18720 \times 3+20340 \times 4+21780 \times 5$ = 56160+81360+108540= 246060

Inte text

And the saving of the family = 35340 So, income = expenditure + saving = 246060+35340 = 281400

And the avg income is

$$\frac{281400}{12} = 23450$$

Answer29 Let the avg payment of 75 workers weakly = 5680 X 75 Given , The avg payment of 25 workers = 25 X 5400 The avg payment of 30 workers = 30 X 5700

Acc to question, Mean salary of 20 remaining

5680 X 75 - (5400 X 25 + 5700 X 30)= 426000 - (135000 + 171000)= 426000 - 306000= 120000

So, Avg salary of 20 remaining =

 $\frac{120000}{2} = 6000$

Answer30 Given, the mean marks of girls and boys will be 70 & 73 Let the required ratio will be x:1

So, the mean marks of all the students is 70x+73= 71(x+1) X=2

So, the ratio will be 2:1 Answer31 Given, monthly salary of 20 workers = 45900 X 20 After adding manager salary , New avg salary = 49200 X 21

Acc to question, Manager salary =

49200 X 21 - 45900 X 20 = 1033200 - 918000 = 115200

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EXERCISE 18B

Answer1.

Xi	fi	Fi X xi
4	4	16
6	8	48
8	14	112
10	11	110
12	3	36
	$\sum fi = 40$	$\sum (fi X xi) = 322$

So, the mean,

$$x = \frac{\sum (fi \ X \ xi)}{\sum fi} = \frac{322}{40} = 8.05$$

Answer2.			\land
Xi	Fi		Fi X xi
60	4		240
63	3		189
66	2		132
69	2		138
72	1	And the second	72
		$\sum fi = 12$	$\sum (fi X xi) = 771$

So, the mean

$$x = \frac{\Sigma(fi X xi)}{\Sigma fi} = \frac{771}{12} = 64.25 \text{kg}$$

Answer3

Xi	Fi	Fi X xi
34	5	170
37	10	370
40	17	680
43	12	516
46	6	276
	$\sum fi = 50$	$\sum (fi X xi) = 2012$

So, the mean,

$$x = \frac{\sum (fi \ X \ xi)}{\sum fi} = \frac{2012}{50} = 40.24mm$$

Answer4

Xi	fi	Fi X xi
15	3	45

16	8	128
17	9	153
18	11	198
19	6	114
20	3	60
	$\sum fi = 40$	$\sum (fi X xi) = 698$

So, the mean,

$$x = \frac{\sum (fi \ X \ xi)}{\sum fi} = \frac{698}{40} = 17.45 yrs$$

Answer 5

Xi	Fi	fi X xi
10	7	70
30	8	240
50	10	500
70	15	1050
89	10	890
	$\sum fi = 50$	$\sum (fi X xi) = 2750$

So mean is,



Answer6

Xi	Fi 🖤	Xi X f1
250	8	2000
300	11	3300
350	6	2100
400	10	4000
450	5	2250
	$\sum fi = 40$	$\sum (fi \ge xi) = 13650$

So mean is,

$$x = \frac{\sum (fi \ X \ xi)}{\sum fi} = \frac{13650}{40} = 341.25$$
rs

Answer7

Xi	Fi	Xi X fi
10	6	60
15	8	120

20	Р	20p
25	10	250
30	6	180
	$\sum fi = 30+p$	$\sum (fi \ge xi) =$ 610+20p

So mean is 20.2(given),

$$x = \frac{\sum (fi \ X \ xi)}{\sum fi} = \frac{610 + 20p}{30 + p} = 20.2$$

Cross multiply 610+20p = 20.2(30+p) 610+20p = 606+20.2p 610-606 = 20.2p-20p 4= 0.2p 20=p

Answer8

Xi	Fi	Xi X fi
3	6	18
5	8	40
7	15	105
9	P	9p
11	8	88
13	4	52
	$\sum fi = 41+p$	$\sum (fi \ge xi) =$ 303+9p

Mean=8(given)

$$\bar{x} = \frac{\sum (fi \times xi)}{\sum fi} = \frac{303 + 9p}{41 + p} = 8$$

cross multiply 303+9p = 8(41+p) 303+9p = 328+8p 9p-8p = 328-303 P = 25

Answer9		
Xi	Fi	xi X fi
15	8	120
20	7	140
25	Р	25p
30	14	420
35	15	525
40	6	240

$$\sum fi = 50 + p \qquad \qquad \sum (fi \ge xi) = 1445 + 25p$$

Mean 28.25(given),

$$\bar{x} = \frac{\sum (fi \times xi)}{\sum fi} = \frac{1445 + 25p}{50 + p} = 28.25$$

Cross multiply,
1445+25p = 28.25(50+p)
1445+25p = 1412.5+28.25p
32.5=3.25p
 $\frac{32.5}{3.25} = p$

10=p

Answer10.

Xi	Fi	Xi X fi
8	12	96
12	16	192
15	20	300
Р	24	24p
20	16	320
25	8	200
30	4	120
	$\sum fi = 100$	$\sum (f1 \ge xi) = 1228 + 24p$

Mean=16.6(given),

$$x = \frac{\sum(fi \times xi)}{\sum fi} = \frac{1228 + 24p}{100} = 16.6$$

Cross multiply,
1228+24p = 16.6 X 100
1228+24p = 1660
24p = 1660-1228
24p = 432
P= $\frac{432}{24}$
P=18

Answer11,

Xi	Fi	Xifi
10	4	40
20	F1	20f1
30	8	240

40	F2	40f2
50	3	150
60	4	240
	$\sum fi =$ 19+f1+f2	$\sum (fi \ge xi) = 670 + 20f1 + 40f2$

Here, $\sum fi = 19+f1+f2$

But,
$$\sum fi = 35$$

∴ 19+f1+f2=35 => f1+f2=16 ...(1)

Also mean,

$\frac{1}{r} - \frac{\sum (fi \ge xi)}{\sum (fi \ge xi)}$	<u>670+20f1+40f2</u>	670 + 320 + 20 f 2	[using (i)]
$x - \sum_{fi} fi$		19+16	[using(i)]
		990 + 20 f 2	
		35	
	-	35	

But mean=34
$.990+20f2_{-24}$
= 34
So, f 2 =10
∴ f1=6

$\therefore \frac{35}{35} = 34$		
So, f 2 =10		Pro 1
∴ f1=6	V 0	apple
		No. Co.
Answer 12	a free the	~
Xi	Fi	Xifi
10	17	170
30	f1	30f1
50	32	1600
70	f2	70f2
90	19	1710
	$\sum fi = 68 + f1 + f2$	$\sum (fi \ge xi) = 3480 + 30f1 + 70f2$

Here,
$$\sum fi = 68 + f1 + f2$$

But, $\sum fi = 120$
 $\therefore 68 + f1 + f2 = 120 \Rightarrow f1 + f2 = 52$...(1)
 $f1 = 52 - f2$...(2)
Also mean,
 $x = \frac{\sum (fi \ge xi)}{\sum fi} = \frac{3480 + 30f1 + 70f2}{68 + f1 + f2} = \frac{3480 + 30(52 - f2) + 7f2}{68 + 52}$ [using...(1)&(2)]
 $= \frac{3480 + 1560 - 30f2 + 70f2}{120}$
MEAN= 50(given)
 $50 = \frac{5040 + 40f2}{120}$

Cross multiply,

6000 = 5040 + 40f2 $f 2 = \frac{960}{40}$ ∴ f 2 = 28& f 1 = 24

Answer 13

Xi	Fi	Xi X fi
15	2	30
17	3	51
19	4	76
20+p	5p	100p+5 p^2
23	6	138
	15+5p	295+100p+5p ²

Mean = 20(given)

 $\bar{x} = \frac{\sum (fi \times xi)}{\sum fi} = \frac{295 + 100p + 5p^2}{15 + 5p} = 20$ Cross multiply 295+100p+5p² = 20(15+5p) 295+100p+5p² = 300+100p 5p² = 300-295 5p² = 5 P² = $\frac{5}{5}$ P² = $\frac{5}{5}$ P² = 1 \therefore p = 1

Answer 14

Xi	Fi	xi X fi
10	17	170
30	5a+3	150a+90
50	32	1600
70	7a-11	490a-770
90	19	1710

	$\sum fi$ = 60+12a	$\sum (fi \ge xi) = 2800+640a$
Mean = 50(given)		

$$x = \frac{\sum (fi \times xi)}{\sum fi} = \frac{2800+640a}{60+12a} = 50$$

Cross multiply
2800+640a = 50(60+12a)
2800+640a = 3000+600a
640a-600a = 3000-2800
40a = 200
a=5
∴ f₃₀ = 28 & f₇₀ = 24



EXERCISE 18C

Answer1

(i) Arranging the nos in ascending order 2,2,3,5,7,9,9,10,11 Here, n = 9 which is odd.

> Therefore, median score = Value of (9+1/2)th term value of 5^{th} term = 7

(ii) Arranging the nos in ascending order 6,8,9,15,16,18,21,22,25

> Here n = 9Therefore, median score = Value of (9+1/2)th term value of 5^{th} term = 16 CK SHEN

Arranging the nos in ascending orders (iii) 6,8,9,13,15,16,18,20,21,22,25

> Here n = 11Therefore, median score = Value of (11+1/2)th term value of 6^{th} term = 16

Arranging the nos, in ascending orders (iv) 0,1,2,2,3,4,4,5,5,7,8,9,10

> Here n = 13Therefore, median score = Value of (13+1/2)th term value of 7^{th} term = 4

Answer2

(i) Arranging the nos. in ascending order 9,10,17,19,21,22,32,35

> Here n = 8Therefore the median score = value of (8/2)th term and (8/2 + 1)th term

> > = avg of 4th and 5th terms

$$=\frac{1}{2}(19+21)=20$$

(ii) Arranging the nos. in ascending order 29,35,51,55,60,63,72,82,85,91 Here n = 10 Therefore the median score = value of (10/2)th term and (10/2 +1)th term = avg of 5th and 6th terms =

$$\frac{1}{2}(60+63) = 61.5$$

(iii) Arranging the nos. in ascending order 3,4,9,10,12,15,17,27,47,48,75,81

Here n=12

Therefore the median score = value of (12/2)th term and (12/2 + 1)th term = avg of 6th and 7th terms

(15+17)

Answer3

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Let arrange marks of 15 students in ascending order 17,17,19,19,20,21,22,23,24,25,26,29,31,35,40
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n = 15
therefore median score = value of (15+1/2)
the value of 8^{th} = 23
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Answer4let arrange heights of 9 students 144,145,147,148,149,150,152,155,160

N= 9

Therefore median score = value of (9+1/2)The value of $5^{th} = 149$ cm

Answer5:-

Let arrange weight (in kg) of 8 children are 9.8, 10.6 , 12.7 , 13.4 ,14.3 , 15 , 16.5 , 17.2

N=8

There median score =1/2{ value of (8/2)th + value of (8+1/2)th} The value of 4th and 5th =

$$\frac{1}{2}(13.4+14.3) = 13.85$$

Answer6-Let arrange the ages of 10 teachers 32,34,36,37, 40,44,47,50,53,54

N= 10

There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5th and 6th =

$$\frac{1}{2}(40+44) = 42 yrs$$

Answer7:-Given series 10,13,15,18, x+1 , x+3 , 30 ,32 ,35 ,41

N=10 and median 24

There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5th and 6th =

> $24 = \frac{1}{2} \{ (x+1) + (x+3) \}$ 48 = 2x + 4 2x = 44x = 22

Answer8

Given series 26,29,42,53,x, x+2 ,70 ,75 ,82 ,93 N= 10 and median = 65

There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5th and 6th =

$$65 = \frac{1}{2} \{x + (x + 2)\}$$

$$65 = \frac{1}{2} (2x + 2)$$

$$130 = 2x + 2$$

$$2x = 130 - 2 = 128$$

$$x = 64$$

Answer9 Given series 50,42,35,(2x+10),(2x-8),12,11,8 N= 10 and median = 25There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5^{th} and 6^{th} =

$$25 = \frac{1}{2} \{ (2x+10) + (2x-8) \}$$

$$50 = (2x+10) + (2x-8)$$

$$50 = 4x + 2$$

$$4x = 48$$

$$x = 12$$

Answer10 Let arrange the series in ascending order 33,35,41,46, 55, 58,64,77,87,90,92 N= 11

The median score = the value of (11+1/2)The value of $6^{th} = 58$

Acc to question, 33,35,,46, 58,61, 64,75,77,87,90,92

N= 11 The median score = the value of (11+1/2)The value of $6^{th} = 64$

EXERCISE 18D

Answer1 Arranging the given data in an ascending order, we get 0,0,1,2,3,4,5,5,6,6,6,6

Here, 6 occurs most often Hence, mode of the given data = 6

Answer2 Arranging the given data in an ascending order, we get 15,20,22,23,25,25,25,27,40

Here, 25 occurs most often Hence, mode of the given data = 25

Answer3 Arranging the given data in an ascending order, we get 1,1,2,3,3,4,5,5,6,6,7,8,9,9,9,9,9,9,9

Here, 9 occurs most often Hence, mode of the given data = 9

Answer4 Arranging the given data in an ascending order, we get 9,19,27,28,30,32,35,50,50,60

Here, 50 occurs most often Hence, mode of the given data = 50

Answer5 The sum of the mean value

nding order, we get

$$\frac{3+21+25+17+(x+3)+19+(x-4)}{7} = 18$$

$$3+21+25+17+3+19-4+2x = 18*7$$

$$2x+84 = 126$$

$$2x = 126-84 = 42$$

$$x = 21$$

so, x+3 = 21+3 = 24 x-4 = 21-4 = 17

here , 3,17,17,19,21,24,25

Here, 17 occurs most often Hence, mode of the given data = 17 Answer6 The arranging the given data in an ascending order, we get 52,53,54,54,(2x+1),55,55,56,57 N= 9 The median value = the value (9+1/2)55 = 2x+12x = 54 X = 27 So, the value $2x+1 = 2 \times 27+1$ = 54 So, the series be 52,53,54,54,54,55,55,56,57 Here 54 occurs most often Hence, mode of the given data = 54 Answer7 Let the series be 24 + 15 + 40 + 23 + 27 + 26 + 22 + 25 + 20 + (x + 3)= 25 10 222 + (x+3) = 250x + 3 = 250 - 222x + 3 = 28x = 28 - 3 = 25Then the median will be Arranging the series in ascending order 15,20,22,23,24,25,25,26,27,40

N= 10

There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5th and 6th =

$$\frac{1}{2}(24+25) = \frac{1}{2}(49) = 24.5$$

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Answer8

Given, median = 45

Series be = 42,43,44,44,(2x+3),45,45,46,47

N= 9

Therefore, median score = Value of (9+1/2)th term

value of 5<sup>th</sup> term = (2x+3)
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$$45 = (2x+3)$$
$$\Rightarrow 2x = 45 - 3 = 42$$
$$\Rightarrow x = \frac{42}{2} = 21$$

The series will be, 42,43,44,44,45,45,45,46,47 And mode is most occurring numbers in series is 45



MULTIPLE-CHOICE QUESTIONS

Answer1(c) Acc to question,

$$\frac{x + (x + 2) + (x + 4) + (x + 6) + (x + 8)}{5} = 11$$
$$\Rightarrow \frac{5x + 20}{5} = 11$$
$$\Rightarrow 5x + 20 = 55$$
$$\Rightarrow 5x = 55 - 20 = 35$$
$$\Rightarrow x = \frac{35}{5} = 7$$

Answer2(c) Acc to question, the mean be

 $\frac{x + (x + 3) + (x + 5) + (x + 7) + (x + 10)}{9} = 9$ 5 $\Rightarrow \frac{5x+25}{5} = 9$ CH BHB \Rightarrow 5*x* = 45 - 25 $\Rightarrow x = 4$ So, the series of last 3 observation be 9,11,14 So, calculated mean = 9+11+14 $=11\frac{1}{3}$ x is the mean of the x1,x2,x3,.....xn

$$\sum_{i=1}^{n} (xi - \overline{x}) = (x1 - \overline{x}) + (x2 - \overline{x}) + (x3 - \overline{x}) + \dots + (xn - \overline{x})$$
$$= (x1 + x2 + x3 + \dots + xn) - n\overline{x} = (n\overline{x} - n\overline{x}) = 0$$

Answer4(b)

Answer3(b) Given,

Then

Let the mean of n observation $x1, x2, x3, \dots, xn$ be x

If each observation is decreased by P then new mean = (x - P)

Answer5(c) Acc to question,

$$\frac{51+45+49+46+44+x}{6} = 48$$
$$\Rightarrow \frac{235+x}{6} = 48$$
$$\Rightarrow x = 288 - 235 = 53kg$$

Answer6(b)
The mean value of 50 students = 50 X 39=1950
Acc to question ,
The correct mean =
$$\frac{1950 \cdot wrong + correct}{50}$$

 $\Rightarrow \frac{1950 - 23 + 43}{50} = \frac{1970}{50} = 39.4$
Answer7(c)
The sum value 100 items mean = 64 X 100= 6400
Correct sum =
6400 + 36 + 90 - 26 - 9 = 6491
So, correct =
 $\frac{6491}{100} = 64.91$
Answer8(b)
Sum of 100 Observation = 50 X 100=5000
Correct sum = $\frac{5100}{100} = 51$

Answer9(b) Here ,

$$\overline{z} = \frac{(x1 + x2 + \dots + xn) + (y1 + y2 + y3 + \dots + yn)}{2n}$$

But
$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n} = (x_1 + x_2 + \dots + x_n) = n\bar{x}$$

 $\bar{y} = \frac{y_1 + y_2 + \dots + y_n}{n} = (y_1 + y_2 + \dots + y_n) = n\bar{y}$
 $\therefore \bar{z} = \frac{n\bar{x} + n\bar{y}}{2n} = \frac{n(\bar{x} + \bar{y})}{2n} = \frac{(\bar{x} + \bar{y})}{2}$

Answer10(b) Given , \overline{x} is the mean of x1, x2,x3,.....,xn then for $a \neq 0$, the mean of ax1,ax2,ax3,.....axn, $\frac{x1}{a}, \frac{x2}{a}, \dots, \frac{xn}{a}$

Required mean

$$\frac{(ax1 + ax2 + ax3 + \dots + axn) + (\frac{x1}{a} + \frac{x2}{a} + \dots + \frac{xn}{a})}{2n}$$

$$\Rightarrow \frac{1}{2} \{\frac{a(x1 + x2 + \dots + xn)}{n} + \frac{\frac{1}{a}(x1 + x2 + \dots + xn)}{n} \}$$

$$\Rightarrow \frac{1}{2} \{a\overline{x} + \frac{1}{a}\overline{x}\} = (a + \frac{1}{a})\frac{\overline{x}}{2}$$
Answer11(c)
Sum of the terms = $\overline{x} \ln 1 + \overline{x} 2n2 + \dots + \overline{x}nxn$
Numbers of terms = $n1 + n2 + \dots + n = n^2$
Therefore required mean =
$$\sum_{i=1}^{n} nix_{i}$$

$$= \frac{\sum_{i=1}^{n} ni\overline{x}i}{n^2}$$

$$mean = \frac{\sum fi \times xi}{\sum fi}$$

$$8 = \frac{(3x6) + (5x8) + (7x15) + 9p + (11x8) + (13x4)}{(6+8+15+p+8+4)}$$

$$8 = \frac{18+40+105+9p+88+52}{41+p}$$

$$8 = \frac{303+9p}{41+p}$$

$$\Rightarrow 303 + 9p = 328 + 8p$$

$$\Rightarrow 9p - 8p = 328 - 303$$

$$\Rightarrow p = 25$$

(40+44)

=42kg

 $=\frac{1}{2}(84)$

Answer13(b) Arrange the series in ascending order 0,13,15,20,27,29,31,34,43,50

N= 11

The median score = the value of (11+1/2)The value of 6^{th} = 29

Answer14(c) Arrange the series in ascending order 31,35,36,38,40,44,45,52,55,60N=10 There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5th and 6th =

Answer15(c) Arrange in the ascending order 3,4,4,5,6,7,7,7,12 N= 9 The median score = the value of (9+1/2) The value of 5th = 6

Answer16(c) Arrange the numbers in ascending order 22,34,39,45,,54,54,56,68,78,84 There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5th and 6th =

$$\frac{1}{2}(54+54)$$

= 54

Answer17(b) Most occurring number in the series is 15

Answer18(b) Given median = 24 N= 10 There median score =1/2{ value of (10/2)th + value of (10+1/2)th} The value of 5th and 6th = $24 = \frac{1}{2} \{ (x+2) + (x+4) \}$ 48 = 2x + 6 2x = 48 - 6 = 42 $x = \frac{42}{2} = 21$