## What is the value of x?

## **STATISTICS**

## 1 MARK QUESTIONS

1. The observations 29, 32, 48, 50, x, x + 2, 72, 78, 84 and 95 are arranged in ascending order. What is the value of x? if the median of the data is 63.

Sol: Given observations are 29, 32, 48, 50, x, x + 2, 72, 78, 84 and 95 (already in ascending order) number of observations n = 10 (even) median =  $\frac{x+x+2}{2}$  = 63 => 2x + 2 = 126 => 2x = 124 => x = 62

2. If the mean of the data 8, 10, x + 1, x + 3, x + 4 and 19 is 13. Find the value of x.

**Sol:** mean of the data 8, 10, x + 1, x + 3, x + 44 and 19 is 3

i,e, mean =  $\frac{8+10+x+1+x+3+x+4+19}{6} = 13$  $=\frac{3x+45}{6}=13 =>3x+45=78$ =>3x = 33 => x = 11

3. If the mode of the data 2, 4, 6, 7, 5, 6, 10, 6, 7, 2k + 1, 9, 7, 13 is 7 then find the value of k?

Sol: In the given data 2, 4, 6, 7, 5, 6, 10, 6, 7, 2k + 1, 9, 7, 13 the observations 6 and 7 are repeating 3 times equal but mode is given as 7 so 2k + 1 = 7 = 2k = 6 = 2k = 3

4. The mean marks of a class of 25 students is 52.4. Later teacher noticed that one students marks were wrongly written as 64 instead of 46. Find the correct mean.?

**Sol:** number of observations = 25,

mean = 52.4, we know that

 $mean = \frac{sum of the observations}{number of observations}$ 

=> sum = mean × number of observations  $= 52.4 \times 25 = 1310$ 

new sum = sum - wrong entry + correct entry

= new sum = 1310 - 64 + 46 = 1292required mean =  $\frac{\text{new sum}}{\text{number of observations}}$ 

 $=\frac{1292}{25}=51.68$ 5. Write the formula to find the mean of

a grouped data using assumed mean method and explain the terms in it. Sol: Mean by assumed mean method

= 
$$a + \frac{\sum f_i d_i}{\sum f_i}$$
 where

 $a = assumed mean, d_i = x_i - a,$  $x_i = mid values of i terms$ 

 $\sum f_i$  = sum of the frequencies of i terms.

6. Find the mean of first ten prime numbers.

**Sol:** The first 10 ten prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, mean =  $\frac{2+3+5+7+11+13+17+19+23+29}{10}$ 

 $=\frac{129}{10}=12.9$ 

7. Mean of 10 observations is 45. If each observation is multiplied by 3 find the mean?

Sol: If each observation under consideration is multiplied by 3 then the new mean is obtained by multiplying the given mean by 3 : new mean (required mean)

 $= 3 \times \text{given mean} = > 3 \times 45 = 135$ 

8. The mean weight of seven boys is 56 kg. Individual weight of six boys (in kgs) are 52, 57, 55, 60, 59, 55 respectively. Find the weight of the seventh boy.

**Sol:** Mean weight of seven boys = 56 sum of the weight of seven boys  $= 56 \times 7 = 392$ 

sum of the weight of six boys = 338weight of  $7^{th}$  boy = 392 - 338 = 54kg.

# Special

9. Find  $\frac{x}{6}$  where 6 is the median of the scores ?  $\frac{x}{2}, \frac{x}{3}, \frac{x}{4}, \frac{x}{5}, \frac{x}{6}$ .

Sol: Given the data is in descending order  $\frac{x}{2}, \frac{x}{3}, \frac{x}{4}, \frac{x}{5}, \frac{x}{6}$ , number of observations n = 5, median =  $(\frac{5}{2} + 1)$ th observation = 3rd observation =  $\frac{x}{4}$  = 6 => x = 24 then

 $\frac{x}{6} = \frac{24}{6} = 4$ .

10. The median of a given data is 125.6 and mean is 128. then mode?

Sol: we know that mode = 3 median - 2 mean=> mode = 3 (125.6) - 2 (128) => mode = 376. 8 - 256 = 120. 8

## 2 MARK QUESTIONS

1. Write the formula of mode of the grouped data and explain the terms in

Sol The mode for the grouped data can be found by using the formula

$$Mode = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$$

where l = lower boundary of the modalclass,  $f_1$  = frequency of the modal class.  $f_0$  = frequency of the class preceding to the modal class.

 $f_2$  = frequency of the succeeding class of the modal class.

h = size of the modal class - interval.

2. Write the formula to find median of the grouped data and explain the terms involving in it.

Sol: The median for the grouped data can be found by using the formula

Median = 
$$l + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$$

where , l = lower limit of the median class.n = number of observations, cf = cumulative frequency of class preceding to the median class, f = frequency of the median class. h = class size.

3. The mean of 1, 7, 5, 3, 4 and 4 is m. The observations 3, 2, 4, 2, 3, 3 and p have the mean (m-1).

## Find the values of m and p

Sol: mean of 1, 7, 5, 3, 4 and 4 is m i.e., mean =  $\frac{1+7+5+3+4+4}{6} = \frac{24}{6}$ =>m = 4, and m - 1 = 3now mean of 3, 2, 4, 2, 3, 3 and p

i.e., mean =  $\frac{3+2+4+2+3+3+p}{7}$  = 3

 $=>\frac{17+p}{7}=3$ , =>p=21-17=4

4. Find the mean of the following data  $10\frac{1}{4}$ , 9,  $4\frac{3}{4}$ , 8,  $2\frac{2}{3}$ , 12 and  $2\frac{1}{3}$ 

Sol: Rational form of the given data is  $\frac{41}{4}$ , 9,  $\frac{19}{4}$ , 8,  $\frac{8}{3}$ , 12 and  $\frac{7}{3}$ 

Lcm of 4, 4, 3, 3 = 12

 $\frac{123}{12}$ ,  $\frac{108}{12}$ ,  $\frac{57}{12}$ ,  $\frac{96}{12}$ ,  $\frac{32}{12}$ ,  $\frac{144}{12}$  and  $\frac{28}{12}$ mean =  $\frac{\frac{123}{12} + \frac{108}{12} + \frac{57}{12} + \frac{96}{12} + \frac{32}{12} + \frac{144}{12} + \frac{28}{12}}{\frac{12}{12} + \frac{144}{12} + \frac{28}{12}}$ 

 $=\frac{588}{12\times7}=\frac{588}{84}=7$ 

5. The mean and median of the data x + a, x + b, x + c are equal and a < b < c, then find the value of 'b' in terms of 'a' and 'b'

**Sol:** The mean of x + a, x + b, x + c is

mean =  $\frac{x+a+x+b+x+c}{3}$  $=\frac{3x+a+b+c}{3}$ ----(1)

number of terms n = 3 (odd)

median =  $\left(\frac{3+1}{2}\right)^{th}$  = 2<sup>nd</sup> term = x +b ---- (2)

 $\frac{3x + a + b + c}{3} = x + b$ 

=> 3x + a + b + c = 3x + 3b

=> 3x + 3b - 3x - a - b - c = 0

=> 2b = a + c

6. Find the value of 'k' of the following data, if the mean of the distribution is 19.5.

X	5	10	15	20	25	30	35
f	1	2	5	6	3	k	1

## Sol:

х	f	fx
5	1	5
10	2	20
15	5	75
20	6	120
25	3	75
30	k	30k
35	1	35
Total	18 + k	330 + 30k

Mean  $\bar{x} = \frac{\sum fx}{\sum f} = \frac{330 + 30k}{18 + k} = 19.5$ 

=> 330 + 30k = 351 + 19.5k

=> 30k-19.5k = 351-330

 $=> 10.5 k = 21 => k = \frac{21}{10.5} = 2$ 

7. Find the mode of the data for the following data.

C.I	0-9	10 - 19	20 - 29	30 - 39	40 - 49 8	50 - 59
F	4	6	16	20	8	6

## Sol:

C.I	f
0 - 9	4
10 - 19	6
20 <i>- 2</i> 9	16 fo
30 - 39	20 f <sub>1</sub>
40 - 49	8 f <sub>2</sub>
50 - <i>5</i> 9	6

Mode =  $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$ 

 $= 29.5 + \left(\frac{20-16}{2(20)-16-8}\right) \times 10$ 

 $= 29.5 + \frac{4}{16} \times 10 = 29.5 + 2.5 = 32$ 

Mode = 32

## 4 MARK QUESTIONS

1. Find the missing frequencies in the following frequency distribution table if N = 100 and median is 32.



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Marks	0	10	20	30	40	50
	-	-	-	-	-	
	10	20	30	40	50	60
Number of students	10	р	25	30	q	10

Sol:

Marks	No. of students	c.f.		
0 - 10	10	10		
10-20	p	10 + p		
20 - 30	25	35 + p		
30 - 40	30	65 + p		
40 - 50	q	65 + p + q		
50 - 60	10	75 + p + q		
Total	75 + p + q = N = 100			

From the data

 $p + q + 75 = 100 \Rightarrow p + q = 25 ---- (1)$ given median is 32, which is lies between 30-40 so the median class is 30-40

now 
$$l = 30$$
,  $\frac{n}{2} = \frac{100}{2} = 50$ ,  $cf = 35 + p$ ,  
 $f = 30$ ,  $h = 10$ , Median  $= l + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$ 

$$=> 32 = 30 + \left(\frac{50 - 35 - p}{30}\right) \times 10$$

$$=> \frac{15-p}{3} = 2 => 15-p = 6 => p = 9,$$

hence p = 9, q = 16 are the required values

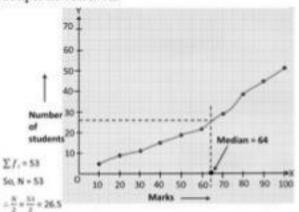
p = 9 in (1),  $9 + q = 25 \Rightarrow q = 25 - 9 = 16$ 

2. The following data indicates the marks of 53 students in mathematics. Draw less than type ogive for the data and hence find median.

Marks	0	10	20	30	40	50	60	70	80	90
	· .	*:	-					-		
	10	20	30	40	50	60	70	80	90	100
Number of students	5	3	4	3	3	4	7	9	7	8

Marks	Number of students	Upper Limits	Less than cumulative frequency
0 - 10	5	10	5
10 - 20	3	20	8
20 - 30	4	30	12
30 - 40	3	40	15
40 - 50	3	50	18
50 - 60	4	60	22
60 - 70	7	70	29
70 - 80	9	80	38
80 - 90	7	90	45
90 - 100	8	100	53

Graph as follows:



from the graph we can notice that median of the data is 64 marks (approximately)

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## October 24th is celebrated as?

## CURRENT AFFAIRS

1. Assertion: In June 2019, India has imposed high tariffs on 28 products of USA

**Reason:** USA has withdrawn GSP facility to India

- A) Both A and R are true and R is the correct explanation of A
- B) Both A and R are true but R is not the correct explanation of A
- C) A is true but R is false D) A is false but R is true
- 2. Match the following Indexes and top states (NITI Aayog Index)
  - 1. Health Index a. Gujarat 2. Ease of doing farm business

b. Maharashtra

- 3. Water Management Index c. Kerala B) 1-b, 2-c, 3-a A) 1-b, 2-a, 3-c C) 1-a, 2-b, 3-c D) 1-c, 2-b, 3-a
- **3. Assertion:** India has launched an online portal 'prakashpurb550.mha.gov.in Reason: Kartarpur Sahib Gurdwara in Punjab Province of India, and many Sikhs from Pakistan want to visit Kartarpur Sahib
  - A) Both A and R are true and R is the correct explanation of A
  - B) Both A and R are true but R is not the correct explanation of A
  - C) A is true but R is false
  - D) A is false but R is true
- 4. Assertion: The Central Government, Odisha government and the World Bank signed a loan agreement worth \$165 million

Reason: Odisha government wants to help smallholder farmers in the state A) Both A and R are true and R is the correct explanation of A

- B) Both A and R are true but R is not the correct explanation of A
- C) A is true but R is false
- D) A is false but R is true
- 5. Match the following, Summer Olympics and venues?

1. 2016 a. Paris 2. 2020 b. Los Angels 3. 2024 c. Tokyo 4. 2028 d. Rio de Janerio A) 1-b, 2-c, 3-a, 4-d B) 1-d, 2-c, 3-a, 4-b

- D) 1-d, 2-b, 3-a, 4-c 6. October 24th is celebrated as?
  - 1. United Nations Day

C) 1-d, 2-c, 3-b, 4-a

- 2. Poverty Eradication Day
- 3. International cooperation day
- 4. World Polio day (Rotary International)

A) 1, 3, 4 C) 1, 4

B) 1, 2, 4 D) 1, 3

7. Match the following persons and

- appointments? 1. Dinesh Sharma a. Lt Governor of Jammu & Kashmir
- 2. Sridharan Pillai b. Governor of Mizoram
- 3. Girish Chandra Murmu

c. Administrator of Lakshadweep

## Nagarkurnool district officer invited by UN

- Talasani Akhilesh Reddy, District Social Welfare Officer, has been invited by the United Nations to participate in the UN International Convention to be held in Beijing from December 2 till 6. He is the only delegate selected for the conference from Telangana and is one among the three delegates invited by the UN. Akhilesh was posted as the Special Officer for the implementation of 30day action plan in Kollapur mandal, where he did a case study on the plan's implementation in Somasila village.
- 4. Radha Krishna Mathur

d. Lt Governor of Ladakh

- A) 1-b, 2-a, 3-c, 4-d
- B) 1-b, 2-c, 3-a, 4-d
- C) 1-a, 2-b, 3-c, 4-d
- D) 1-c, 2-b, 3-a, 4-d
- **8. Assertion:** Southern Railway released a new application called Rail Dhandora Reason: Railways wants to reduce usage of paper for day-to-day operations
  - A) Both A and R are true and R is the correct explanation of A
  - B) Both A and R are true but R is not the correct explanation of A
  - C) A is true but R is false
  - D) A is false but R is true
- 9. In a bid to provide quality drinking water to every urban household in the state, Which state has inked a Letter of **Understanding (LoU) on "drink from** tap mission" with the United Nations Children's Fund (UNICEF)?
  - A) Kerala
- B) Gujarat
- D) West Bengal C) Odisha
- 10. Which of the following two Indians won the Wisden India Almanack Cricketer of the Year award?
  - 1. Rohit Sharma 2. Bhumra
  - 3. Virat Kohli 4. Smrithi Mandhana A) 2, 3 B) 2, 4 C) 1, 4 D) 1, 3
- 11. For preparing ease of doing business report to provide a holistic picture of business environment of the country, data is taken from which of the following cities from this year
  - onwards? 1. Delhi
- 2. Mumbai
- 3. Hyderabad 4. Kolkata
- 5. Chennai

A) 1, 2, 3, 4

B) 2, 3, 4, 5 D) 1, 2, 3, 4, 5 C) 1, 2, 4, 5

- 12. Match the following heads of the states and countries?
  - 1. Alberto Fernandez a. Argentina President
  - 2. Nyusi b. Mozambique
  - 3. Sophie Wilmes
- President c. Belgium Prime Minister
- A) 1-b, 2-a, 3-c
- B) 1-b, 2-c, 3-a

## IIIT Hyderabad researchers create first ever Indian Brain atlas

✓ Researchers at the IIIT Hyderabad said that the first ever Indian Brain Atlas (IBA) has been created. They stated that the next step is to prepare atlases for different age groups to study age related affects on brain anatomy. The average brain size of an Indian was smaller in height, width and volume in comparison to people of the Caucasian and eastern races. The immediate implication of this finding can be seen in treatment outcomes of neurological problems or brain related ailments - like dementia, Alzheimer's disease, Parkinson's disease etc.

### D) 1-c, 2-b, 3-a C) 1-a, 2-b, 3-c

- **13. Assertion:** The government is constituting a high-level panel under Rajiv Gauba, the Cabinet Secretary **Reason:** Government wants to mitigate financial stress in the telecom sector A) Both A and R are true and R is the
  - correct explanation of A B) Both A and R are true but R is not the
  - correct explanation of A C) A is true but R is false
  - D) A is false but R is true
- 14. Observe the following?
  - 1. Justice Sharad Arvind Bobde has been appointed as the 47th Chief Justice of India
  - 2. Cabinet Committee on appointments, appoints Supreme Court Chief Justice
  - 3. HJ Kania is the first Chief Justice of India
  - 4. President appoints Chief Justice of India Which of the above are correct A) 1, 2 B) 1, 4 C) 1, 2, 3 D) 1, 3, 4
- 15. Match the following states and reasons for being in news?
  - 1. First State to enact a law a. Tamilnadu on contract farming
  - 2. First state to declare Water Policy b. Meghalaya
  - 3. First state to pass bill
  - against mob lynching A) 1-b, 2-a, 3-c
  - C) 1-a, 2-b, 3-c
- B) 1-b, 2-c, 3-a D) 1-c, 2-b, 3-a

c. Rajasthan



- 16. The new director-general of the **International Atomic Energy Agency** (IAEA), a United Nations' nuclear watchdog is?
  - A) Rafael Grossi
  - B) Christine Lagarde
  - C) Leeward Tananbe
  - D) Yukiya Amano
- 17. October 31st is celebrated as?
  - 1. World Cities Day
  - 2. World Tree day
  - 3. World Savings day
  - A) 1, 2 B) 2, 3 C) 1, 2, 3 D) 1, 3
- 18. Match the following persons and awards? 1. Golden Dragon Award at the Cardiff
  - International Film Festival a. Nawazuddin Siddiqui
  - 2. Australia India Science, Research and
  - Development category b. Neena Mitter
  - 3. Sakharov Prize c. Ilham Tohti
- 19. Observe the following?
  - 1. India now has 29 states and 9 Union Territories
  - 2. India now has 28 states and 9 Union **Territories**
  - 3. Among Union Territories, three have Legislative Assembly 4. Among Union Territories, two have
  - Legislative Assembly Which of the above are true
- A) 1, 3 B) 2, 4 C) 1, 4 D) 2, 3 20. Match the following venues and
  - reasons for bring in news? 1. Hunar Haat (Exhibition) a. Rajasthan
  - 2. Dharma Guardian (Military exercise) b. Kerala
  - 3. Shakti-2019 (Army troops exercise) c. Mizoram
  - 4. Global Ayurveda Summit 2019 d. Uttar Pradesh



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- A) 1-b, 2-c, 3-a, 4-d
- B) 1-d, 2-c, 3-a, 4-b
- C) 1-d, 2-c, 3-b, 4-a
- D) 1-d, 2-b, 3-a, 4-c 21. Observe the following?
  - 1. UNESCO has designated Mumbai as a member of UNESCO Creative Cities Network (UCCN) in the field of Film
  - 2. UNESCO has designated Hyderabad as a member of UNESCO Creative Cities Network (UCCN) in the field of Gastronomy

Which of the above are correct

- A) Only 1 B) Only 2
- C) Both 1 and 2 D) None
- 22. Observe the following? 1. India signed an agreement with Saudi Arabia to launch the RuPay card
  - 2. Saudi Arabia is the third nation in the West Asia to initiate India's digital payment system
  - 3. Saudi Arabia is the first nation in the West Asia to initiate India's digital payment system
  - 4. India has already launched the RuPay card in the UAE, Bahrain, Singapore and Bhutan

Which of the above are true A) 1, 3, 4 B) 1, 4 C) 1, 2 D) 1, 2, 4

- 23. Match the following persons and
  - 1. 28th Vyas Samman for the year 2018 a. Neeraj sharma
  - b. Leeladhar Jagoori 3. Early career researcher of the year 2019

2. Special Icon of Golden Jubilee award

- c. Rajinikanth 4. Italian Golden Sand Art Award 2019
- d. Sudershan Patnaik A) 1-b, 2-c, 3-a, 4-d

awards?

- B) 1-d, 2-c, 3-a, 4-b
- C) 1-d, 2-c, 3-b, 4-a
- D) 1-d, 2-b, 3-a, 4-c
- 24. Observe the following?
  - 1. Rohit Sharma has broken former India captain MS Dhoni's record for playing the most number of T20Is (men's) for India
  - 2. Rohit Sharma surpassed Virat Kohli's record to become the highest rungetter in the T20I format of the game.

Which of the above are correct A) Only 1 B) Only 2 C) Both 1 and 2 D) None

**ANSWERS** 1-A 2-D 3-C 4-A 5-B **6-C** 10-B 11-B 12-C 13-A 14-D 15-C 16-A 17-D 18-C 19-D 20-B 21-C 22-D 23-A 24-C

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