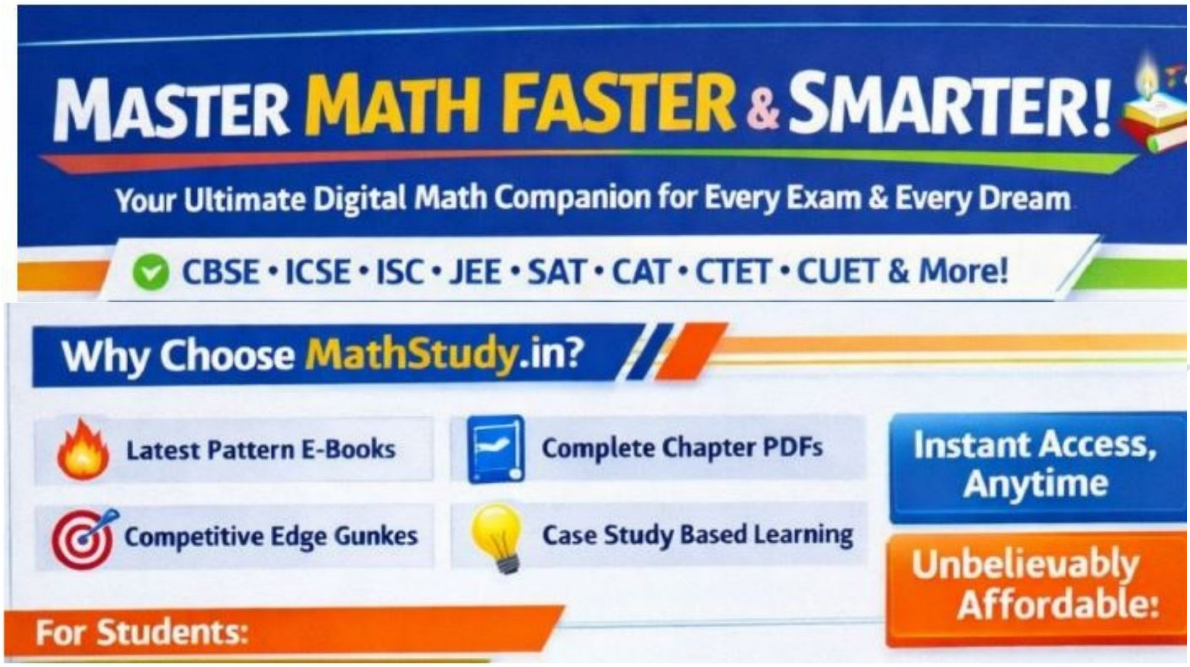
SOLUTIONS

www.udgamwelfarefoundation.com

For Best Mathematics E-Books, Visit:
www.mathstudy.in

www.udgamwelfarefoundation.com



Special Features

- **Board-Specific** – CBSE, ICSE, ISC, State Boards
- **Exam-Focused** – JEE, SAT, CAT, CTET, CUET, NTSE
- **Grade-Wise** – Class 6 to 12
- **Bilingual Options** – English & Hindi Medium Support
- **Printable & Shareable** – Use offline, anytime

How to Order:

Visit : https://www.mathstudy.in
Browse by Exam, Class, or Topic
Add to Cart & Checkout

Contact & Support:

Email: admin@mathstudy.in
WhatsApp Support Available : +91-+91 92118 65759

Why Wait? Empower your learning journey, save time, and achieve your dreams!

Explore & Start Learning Today:
https://www.mathstudy.in – Premium eBooks for success
https://www.udgamwelfarefoundation.com – Free PDFs, practice tests, & guida

MathStudy.in — Empowering Learners, Enabling Educators, Encouraging Excellence.
Digital Learning | Affordable Excellence | Trusted by Thousands

DETAILED SOLUTIONS: STATISTICS (HOTS)

Mathematics | Class IX | (2026/STAT-HOTS/09/001)

Section A: Multiple Choice Questions

1. **Answer: (c) 11.33**
   Solution: Mean $= \frac{\sum x}{n} \implies 9 = \frac{x+(x+3)+(x+5)+(x+7)+(x+10)}{5} \implies 45 = 5x + 25 \implies 5x = 20 \implies x = 4$.
   Last three observations: $x + 5 = 9, x + 7 = 11, x + 10 = 14$.
   Mean $= \frac{9+11+14}{3} = \frac{34}{3} = 11.33$.

2. **Answer: (c) is increased by a**
   Solution: If $y_i = x_i + a$, then $\bar{y} = \frac{\sum(x_i+a)}{n} = \frac{\sum x_i+na}{n} = \bar{x} + a$.

3. **Answer: (b) 7**
   Solution: Class Mark = 10, Width $(h) = 6$.
   Lower limit = Class Mark $-\frac{h}{2} = 10 - 3 = 7$.

4. **Answer: (b) 64**
   Solution: $n = 10$ (even). Median = average of 5^{th} and 6^{th} terms.
   $65 = \frac{x+(x+2)}{2} \implies 130 = 2x + 2 \implies x = 64$.

5. **Answer: (b) 51**
   Solution: Old Sum $= 100 \times 50 = 5000$.
   New Sum $= 5000 - 50 + 150 = 5100$. New Mean $= \frac{5100}{100} = 51$.

6. **Answer: (b) 10**
   Solution: Min value = 210, Max value = 406. Range $= 406 - 210 = 196$.
   Class size = 20. Number of classes $= \frac{196}{20} \approx 9.8$. Thus, 10 classes are needed.

7. **Answer: (c) 0**
   Solution: Sum of deviations from mean is always zero. $\sum x_i - \sum \bar{x} = n\bar{x} - n\bar{x} = 0$.

8. **Answer: (c) 35**
   Solution: 5 classes of width 5 starting at 10: [10-15], [15-20], [20-25], [25-30], [30-35].
   Upper limit is 35.

Section B: Short Answer Questions

1. **Solution:** Sum of 25 obs $= 25 \times 36 = 900$.
   Sum of first 13 $= 13 \times 32 = 416$. Sum of last 13 $= 13 \times 40 = 520$.
   13^{th} observation = (Sum of first 13 + Sum of last 13) − Sum of 25
   $= (416 + 520) - 900 = 936 - 900 = 36$.

2. **Solution:** (Class intervals: 0-10, 10-20, 20-30, 30-40, 40-50).
   Freq: $0 - 10 : 2$; $10 - 20 : 5$; $20 - 30 : 7$; $30 - 40 : 3$; $40 - 50 : 3$. Total = 20.

3. **Solution:** New Mean $= 20 - 5 = 15$.
   Property: If a constant k is subtracted from every observation, the mean is reduced by k.

4. **Solution:** Arranged data: 0,0,1,1,1,1,1,2,2,2,2,2,2,2,2,2,3,3,4,4.
   Mode = 2 (highest freq 9). Median $(n = 20)$ = average of 10^{th} and 11^{th} (both are 2) = 2.

www.udgamwelfarefoundation.com

Section C: Short Answer Questions

1. **Solution:** Sum (Mon-Sun) $= 7 \times 28 = 196$.
   Sum (M-Th) $= 4 \times 26 = 104$. Sum (Th-Sun) $= 4 \times 30 = 120$.
   Thu Temp = (Sum M-Th + Sum Th-Sun) − Sum Mon-Sun
   $= (104 + 120) - 196 = 224 - 196 = 28°$C.

2. **Histogram Adjustment:** Minimum class width = 5.
   Adj. Freq for 15–25: $\frac{10}{10} \times 5 = 5$.
   Adj. Freq for 25–45: $\frac{8}{20} \times 5 = 2$.
   Adj. Freq for 45–75: $\frac{15}{30} \times 5 = 2.5$.

3. **Solution:** Squares: 1, 4, 9, 16, 25. Mean of squares $= \frac{1+4+9+16+25}{5} = \frac{55}{5} = 11$.
   Mean of 1-5 = 3. Square of mean $= 3^2 = 9$.
   Comparison: Mean of squares (11) > Square of mean (9).

Section D: Long Answer / HOTS Questions

1. **Solution:** Plot class marks (5, 15, 25, 35, 45) against frequencies.
   Inference: Section A has more students in the high score range (20-40), whereas Section B is heavily concentrated in the 10-20 range, implying Section A performed better.

2. **Solution:** (1) $\sum x_i - 5n = 20 \implies n\bar{x} - 5n = 20$.
   (2) $\sum x_i - 8n = 14 \implies n\bar{x} - 8n = 14$.
   Subtract (2) from (1): $3n = 6 \implies n = 2$.
   Substitute n: $2\bar{x} - 10 = 20 \implies 2\bar{x} = 30 \implies \bar{x} = 15$.

3. **Solution:**
   (ii) Party A won max seats (75).
   (iii) **Mean:** $\frac{75+55+37+29+10+37}{6} = \frac{243}{6} = 40.5$.
   Median: Data: 10, 29, 37, 37, 55, 75. Median $= \frac{37+37}{2} = 37$.

www.udgamwelfarefoundation.com