

JAWAPAN

BAB
12

Sukatan Kecenderungan Memusat Measures of Central Tendencies

1. (a) Mod/ Mode = 3 g dan/ and 9 g

Susunan data mengikut tertib menaik:

Data arrangement in ascending order:

1 g, 3 g, 3 g, 7 g, 9 g, 9 g, 11 g, 15 g, 23 g

Median/ Median = 9 g

Min/ Mean

$$= \frac{15 + 9 + 11 + 3 + 23 + 7 + 9 + 3 + 1}{9}$$

$$= 9 \text{ g}$$

- (b) Mod/ Mode = Tiada/ None

Susunan data mengikut tertib menaik:

Data arrangement in ascending order:

RM13, RM15, RM17, RM18, RM19, RM20, RM24

Median/ Median = RM18

Min/ Mean

$$= \frac{19 + 13 + 18 + 15 + 20 + 17 + 24}{7}$$

$$= \text{RM18}$$

- (c) Mod/ Mode = 2.2 m

Susunan data mengikut tertib menaik:

Data arrangement in ascending order:

1.5 m, 1.9 m, 2.2 m, 2.2 m, 2.7 m, 3.3 m

$$\text{Median/ Median} = \frac{2.2 + 2.2}{2} = 2.2 \text{ m}$$

Min/ Mean

$$= \frac{1.5 + 2.7 + 2.2 + 1.9 + 3.3 + 2.2}{6}$$

$$= 2.3 \text{ m}$$

2. (a)

Jisim (kg) Mass (kg)	40	41	42	43
Bilangan murid Number of students	5	8	7	6

Data ke-6 – Data ke-13
6th data – 13th data

Data ke-14 – Data ke-20
14th data – 20th data

Jumlah kekerapan

Total frequency

$$= 5 + 8 + 7 + 6$$

$$= 26$$

$$\text{Mod/ Mode} = 41 \text{ kg}$$

Median/ Median

$$= \frac{1}{2} \left[\text{data ke-} \left(\frac{26}{2} \right) + \text{data ke-} \left(\frac{26}{2} + 1 \right) \right]$$

$$= \frac{1}{2} \left[\left(\frac{26}{2} \right)^{\text{th}} \text{ data} + \left(\frac{26}{2} + 1 \right)^{\text{th}} \text{ data} \right]$$

$$= \frac{1}{2} [\text{data ke-}(13) + \text{data ke-}(14)]$$

$$= \frac{1}{2} [13^{\text{th}} \text{ data} + 14^{\text{th}} \text{ data}]$$

$$= \frac{1}{2} (41 + 42)$$

$$= 41.5 \text{ kg}$$

Min/ Mean

$$= \frac{(40 \times 5) + (41 \times 8) + (42 \times 7) + (43 \times 6)}{26}$$

$$= \frac{1080}{26}$$

$$= 41.5 \text{ kg}$$

- (b) Jumlah kekerapan/ Total frequency

$$= 4 + 5 + 6 + 4 + 2$$

$$= 21$$

Mode/ Mode = 2

Median/ Median

$$= \text{data ke-} \left(\frac{21 + 1}{2} \right)$$

$$= \left(\frac{21 + 1}{2} \right)^{\text{th}} \text{ data}$$

$$= \text{data ke-} 11$$

$$11^{\text{th}} \text{ data}$$

$$= 12$$

Min/ Mean

$$= \frac{(0 \times 4) + (1 \times 5) + (2 \times 6) + (3 \times 4) + (4 \times 2)}{21}$$

$$= \frac{37}{21}$$

$$= 1.8$$

3. (a) Mod/ Mode = 3.5 mm

Median/ Median = 3.7 mm

Min/ Mean

$$= \frac{3.5 + 3.5 + 3.7 + 4.4 + 5.8}{5}$$

$$= 4.18 \text{ mm}$$

(b) Mod/ Mode = 3.5 mm

Median/ Median = 3.7 mm

Min/ Mean

$$= \frac{3.5 + 3.5 + 3.7 + 4.4 + 15.8}{5}$$

$$= 6.18 \text{ mm}$$

Nilai 15.8 mm ialah nilai ekstrem. Nilai min berubah daripada 4.18 mm kepada 6.18 mm manakala nilai mod dan median tidak berubah.

15.8 mm is an extreme value. The mean value changes from 4.18 mm to 6.18 mm whereas the mode and median do not change.

4.

Data asal Original data			Data, x					Mod Mode	Median Median	Min Mean
			4	7	7	8	10	7	7	7.2
Perubahan Changes	Seragam Uniform	$x - 2$	2	5	5	6	8	5	5	5.2
		$x \times 5$	20	35	35	40	50	35	35	36
	Tidak seragam Non-uniform		$x - 1$	$x - 2$	$x - 3$	$x - 5$	$x - 7$			
			3	5	4	3	3	3	3	3.6

Berdasarkan jadual di atas, / Based on the above table

- Apabila setiap data berubah secara seragam, nilai min, median dan mod baharu juga berubah secara seragam.

When each data changes uniformly, the values of new mean, median and mode also changes uniformly.

- Apabila setiap data berubah secara tidak seragam, nilai min, median dan mod baharu juga berubah secara tidak seragam.

When each data changes non-uniformly, the values of new mean, median and mode also changes non-uniformly.

5. (a)

Kelas Class	Gundalan Tally	Kekerapan Frequency
21 – 30	### /	6
31 – 40	###	5
41 – 50	### ##	10
51 – 60	////	4
61 – 70	##	5

- (b) (i) Selang kelas 31 – 40 dan 61 – 70 dengan kekerapannya ialah 5.

Class intervals of 31 – 40 and 61 – 70 with its frequency is 5.

- (ii) Kekerapan tertinggi ialah 10 dengan selang kelas 41 – 50. Ini menunjukkan kebanyakan murid dalam ujian itu memperoleh markah antara 41 hingga 50.

The highest frequency is 10 with the class interval of 41 – 50. This shows that most of the students obtained marks between 41 to 50.

6. (a)

Suhu (°C) Temperature (°C)	Gundalan Tally	Kekerapan Frequency
21 – 25	###	8
26 – 30	###	7
31 – 35	###	9
36 – 40		4

(b) 31 – 35

7. (a) RM2 000 – RM2 999

(b) 2.5 km – 2.9 km

8. (a)

Masa (minit) Time (minutes)	Titik tengah Midpoint
4.5 – 4.9	4.7
5.0 – 5.4	5.2
5.5 – 5.9	5.7
6.0 – 6.4	6.2

(b)

Upah (RM) Wages (RM)	Titik tengah Midpoint
100 – 199	149.5
200 – 299	249.5
300 – 399	349.5
400 – 499	449.5

9. (a)

Jisim (kg) Weight (kg)	Titik tengah, x Midpoint, x	Kekerapan, f Frequency, f	$f \times x$
21 – 30	$\frac{21 + 30}{2} = 25.5$	6	$6 \times 25.5 = 153$
31 – 40	$\frac{31 + 40}{2} = 35.5$	5	$5 \times 35.5 = 177.5$
41 – 50	$\frac{41 + 50}{2} = 45.5$	10	$10 \times 45.5 = 455$
51 – 60	$\frac{51 + 60}{2} = 55.5$	5	$5 \times 55.5 = 277.5$
61 – 70	$\frac{61 + 70}{2} = 65.5$	4	$4 \times 65.5 = 262$
		$\sum f = 30$	$\sum fx = 1\,325$

Min/ Mean
$$= \frac{\sum fx}{\sum f}$$
$$= \frac{1\,325}{30}$$
$$= 44.17$$

10. (a) Mod bagi menunjukkan hari yang paling banyak menerima surat.
Mode to show the day that received the highest number of letters.
- (b) Median kerana terdapat nilai ekstrem dalam set data iaitu 17.
Median because there is an extreme value in the set of data which is 17.
- (c) Mod kerana ini ialah data kategori dan untuk menunjukkan item kegemaran.
Mode because this is a categorical data and to show favourite item.
- (d) Min kerana tiada nilai ekstrem dalam set data.
Mean because there is no extreme value in the set of data.

11. (a) (i)
$$\text{Min / Mean} = \frac{50 + 50 + 25 + 60 + 20}{5}$$
$$= 41$$
- (ii) Tingkatan 4 / Form 4
- (iii) Kedudukan median / Position of median
$$= \frac{n + 1}{2} = \frac{205 + 1}{2} = 103$$

Median = Tingkatan 3 / Form 3

- (b) (i) 4 markah / marks

(ii)

Markah Marks	Kekerapan Frequency
5	8
4	16
3	5
2	4
1	7

Min / Mean
$$= \frac{8 \times 5 + 16 \times 4 + 5 \times 3 + 4 \times 2 + 7 \times 1}{40}$$
$$= 3.35$$

- (iii) Median = di antara nilai ke-20 dan ke-21
between 20th and 21th value
= 4 markah / marks

12. (a) (i) Kilang / Factory A:
Min / Mean
$$= \frac{80 + 75 + 80 + 80 + 80 + 81 + 84}{7}$$
$$= 80 \text{ kg}$$

Kilang / Factory B:
Min / Mean
$$= \frac{82 + 85 + 70 + 80 + 81 + 78 + 84}{7}$$
$$= 80 \text{ kg}$$

- (ii) Kilang / Factory A:
Julat / Range = $84 - 75 = 9 \text{ kg}$
Kilang / Factory B:
Julat / Range = $85 - 70 = 15 \text{ kg}$

- (iii) Kilang A. Walaupun kedua-dua kilang itu mempunyai min jisim tepung gandum yang sama, tetapi kilang A membekalkan jisim tepung gandum yang lebih konsisten berbanding dengan kilang B.
Factory A. Although both factories have the same mean mass of wheat flour, but factory A provides a more consistent mass of wheat flour compared to factory B.

- (b) (i) Bagi gerai P, sukatan kecenderungan memusat yang sesuai ialah median kerana terdapat nilai ekstrem, iaitu 45 dalam data tersebut.
For stall P, the appropriate measure of central tendency is median because there is an extreme value, which is 45 in the data.
45, 70, 80, 85, 87
Median/ Median = 80

Bagi gerai Q, sukatan kecenderungan memusat yang sesuai ialah min kerana taburan markah adalah sekata.

For stall Q, the appropriate measure of central tendency is mean because the distribution of the marks is uniform.

$$\begin{aligned}\text{Min/ Mean} &= \frac{85 + 80 + 79 + 73 + 78}{5} \\ &= \frac{395}{5} \\ &= 79\end{aligned}$$

(ii) Julat gerai P / Range of stall P = $87 - 45 = 42$

Julat gerai Q / Range of stall Q = $85 - 73 = 12$

$$\begin{aligned}\text{Min gerai P} &= \frac{85 + 80 + 70 + 87 + 45}{5} \\ \text{Mean of stall P} &= \frac{367}{5} \\ &= 73.4\end{aligned}$$

Gerai Q kerana secara keseluruhan, markah bagi gerai Q adalah lebih tinggi (min Q > min P) dan lebih konsisten (julat Q < julat P) berbanding gerai P.

Stall Q because as overall, the mark for stall Q is higher (mean of Q > mean of P) and more consistent (range of Q < range of P) than stall P.

Power PT3

Bahagian A

1. 2.4, 2.5, 3.2, 4.1, 5.4, 6.3, 6.7

↑
Median

Jawapan / Answer: **C**

2. Jumlah nilai enam nombor

Total value of six numbers
 $= 24 \times 6 = 144$

Jumlah nilai sembilan nombor

Total value of nine numbers
 $= 30 \times 9 = 270$

Jumlah nombor yang ditambah

Total value of added numbers
 $= 270 - 144$
 $= 126$

$$x + (x + 2) + (x - 2) = 126$$

$$3x = 126$$

$$x = \frac{126}{3}$$

$$= 42$$

Jawapan / Answer: **B**

3. Min asal / Original mean

$$= \frac{17.2}{4}$$

$$= 4.3$$

$$\frac{2.1 + 3.2 + p + 5.5 + 6.2}{5} = 4.3$$

$$17 + p = 21.5$$

$$p = 4.5$$

Jawapan / Answer: **B**

4. $\frac{3}{12} \times 100 = 25\%$

Jawapan / Answer: **A**

Bahagian B

5.

Bilangan hari Number of days	Kekerapan Frequency
0	3
1	7
2	6
3	3

6. (i)

Sekolah School	Pusingan / Markah				Min Mean
	1	2	3	4	
X	12	18	17	16	15.75
Y	15	13	18	14	15
Z	10	15	19	15	14.75

Min bagi Sekolah X

Mean of School X

$$= \frac{12 + 18 + 17 + 16}{4}$$

$$= \frac{63}{4}$$

$$= 15.75$$

Min bagi Sekolah Y

Mean of School Y

$$= \frac{15 + 13 + 18 + 14}{4}$$

$$= \frac{60}{4}$$

$$= 15$$

Min bagi Sekolah Z

Mean of School Z

$$= \frac{10 + 15 + 19 + 15}{4}$$

$$= \frac{59}{4}$$

$$= 14.75$$

(ii) Sekolah X

School X

Bahagian C

7. (a) (i) 60 – 69
(ii)

Markah Marks	Titik tengah Midpoint (x)	Kekerapan Frequency (f)	f × x
20 – 29	$\frac{20 + 29}{2} = 24.5$	2	49
30 – 39	$\frac{30 + 39}{2} = 34.5$	1	34.5
40 – 49	$\frac{40 + 49}{2} = 44.5$	2	89
50 – 59	$\frac{50 + 59}{2} = 54.5$	3	163.5
60 – 69	$\frac{60 + 69}{2} = 64.5$	7	451.5
70 – 79	$\frac{70 + 79}{2} = 74.5$	4	298
80 – 89	$\frac{80 + 89}{2} = 84.5$	1	84.5
		$\sum f = 20$	$\sum fx = 1\,170$

Min / Mean = $\frac{\sum fx}{\sum x}$
= $\frac{1\,170}{20}$
= 58.5

(b) (i) $2 + 2 + x + 5 + x + 7 = 30$
 $2x = 30 - 16$
 $2x = 14$
 $x = 7$

(ii) Mod / Mode = 20
Median
= $\frac{1}{2} \left[\text{data ke-} \left(\frac{30}{2} \right) + \text{data ke-} \left(\frac{30}{2} + 1 \right) \right]$
= $\frac{1}{2} \left[\left(\frac{30}{2} \right)^{\text{th}} \text{ data} + \left(\frac{30}{2} + 1 \right)^{\text{th}} \text{ data} \right]$
= $\frac{1}{2} (\text{data ke-15} + \text{data ke-16})$
= $\frac{1}{2} (15^{\text{th}} \text{ data} + 16^{\text{th}} \text{ data})$
= $\frac{1}{2} (30 + 30)$
= 30
(iii) Purata / Average
 $(10 \times 2) + (20 \times 9) + (30 \times 5) + (40 \times 7)$
= $\frac{+ (50 \times 7)}{30}$
= $\frac{20 + 180 + 150 + 280 + 350}{30}$
= $\frac{980}{30}$
= 32.7
= 33 buah beg tangan
33 handbags

Power KBAT

Nama / Name	Median / Median	Mod / Mode	Min / Mean
Thinesh	6	6	6.8
Meng Kai	6	6	6.3
Sawing	6	6	6.7
Nadira	6	4	5.8

	Bulan / Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Min / Mean	6	5.5	7.5	6.5	7	8.5	8	5.5	6.5	5	7	4
Median / Median	6	5	7	6	7	9	8	5	5	5	7	4

- (a) Nilai median adalah sama bagi setiap orang. Oleh itu, median tidak dapat menentukan siapakah yang paling kerap bersenam.
The median value is the same for each person. Thus, the median cannot determine which person does the most exercise.
- (b) Nadira kerana nilai modnya adalah yang paling kecil, iaitu 4, berbanding yang lain.
Nadira because the mode value is the smallest, which is 4, compared to others.
- (c) Susunan nilai min daripada paling kecil kepada paling besar:
The arrangement of the mean values from the smallest to the largest:
Nadira, Meng Kai, Sawing, Thinesh
- (d) Disember kerana nilai min bagi bulan Disember adalah yang paling kecil, iaitu 4.
December because the mean value for December is the smallest, which is 4.
- (e) Jun kerana nilai median bagi bulan Jun adalah paling besar, iaitu 9.
June because the median value for June is the largest, which is 9.