

**MODUL 8**  
**MATEMATIK SPM “ENRICHMENT”**  
**TOPIC : STATISTICS**  
**TIME : 2 HOURS**

1. The data in Diagram 1 shows the body masses, in kg, of 40 children in a kindergarten.

16	24	34	26	30	40	35	30	26	33
18	20	29	31	30	40	34	36	35	32
33	34	37	35	35	38	39	41	25	25
25	26	27	28	21	23	31	31	38	33

- a) Based on the data in Diagram 1 and using a class interval of 5 kg, complete Table 1 in the answer space.
- b) Based on your table in a)
- i) state the modal class,
  - ii) find the number of children who have a body mass of not less than 35 kg,
  - iii) calculate the mean body mass and give your answer correct to 2 decimal places.
- c) For this part of the question, use the graph paper provided. By using a scale of 2 cm to 5 kg on the horizontal axis and 2 cm to 2 children on the vertical axis, draw a histogram to represent the above data.
- d) Hence, on the same axes, draw a frequency polygon for the data.

Answer:

a)

Body mass(kg)	Midpoint	Lower boundary	Upper boundary	Frequency
15-19				
20-24				

Table 1

b) i)

ii)

iii)

2. The data in Diagram 2 shows the marks for a Mathematics monthly test for 40 pupils.

28	35	22	40	29	30	32	23
19	27	32	32	37	33	35	40
35	39	34	38	45	21	34	30
44	14	22	39	33	31	28	27
28	38	26	22	17	26	24	20

- a) Based on the data in Diagram 2 and using a class interval of 5 marks, complete Table 2 in the answer space.
- b) For this part of the question, use the graph paper provided.  
By using a scale of 2 cm to 5 marks on the horizontal axis and 2 cm to 5 pupils on the vertical axis, draw an ogive for the data.
- c) From the ogive,  
i) find the upper quartile,  
ii) hence, explain briefly the meaning of the upper quartile.

Answer:

a)

Marks	Frequency	Cumulative frequency
11-15		
16-20		

Table 2

c) i)

ii)

3. The data in Diagram 3 shows the ages of members of a golf club.

45	53	48	54	46	53	55	43	47	52
63	57	50	40	52	45	49	61	54	56
51	41	56	51	61	50	53	48	51	44
57	53	47	55	46	54	42	57	58	63
42	64	50	49	52	47	55	52	45	51

- Based on the data in Diagram 3 and using a class interval of 5 years, complete Table 3 in the answer space.
- Based on the table in a), calculate the estimated mean age of the members of the golf club.
- By using a scale of 2 cm to 5 years on the x-axis and 2 cm to 2 persons on the y-axis, draw a histogram based on the data.
- State one piece of information obtained based on the histogram in c).

Answer:

a)

Age	Frequency	Midpoint
40-44		
45-49		

Table 3

b)

d)

4. The data in Diagram 4 shows the donations, in RM, of 40 people to a charity fund.

12	48	27	43	33	40	18	29	41	30
45	35	56	16	24	49	32	31	53	13
22	42	38	21	47	32	46	17	37	44
38	23	47	35	40	28	35	43	58	26

- a) Based on the data in Diagram 4 and using a class interval of RM10, complete Table 4 in the answer space.
- b) By using a scale of 2 cm to RM10 on the x-axis and 2 cm to 5 persons on the y-axis, draw an ogive based on the data.
- c) From your ogive in b),
- find the third quartile,
  - explain briefly the meaning of the third quartile.

Answer:

a)

Donation (RM)	Frequency	Cumulative frequency
10-19		
20-29		

Table 4

c) i)

ii)

5. The data in Diagram 5 shows the mass, in kg, of 40 pupils in a class.

36	55	46	45	55	35	39	59
41	50	50	39	41	52	40	41
38	39	33	45	48	52	35	51
40	42	47	36	41	36	49	32
42	40	37	44	48	48	43	43

- a) Based on the data in Diagram 5 and using a class interval of 5 kg, complete Table 5 in the answer space.
- b) From the table in a),
- State the modal class,,
  - Calculate the estimated mean mass of the pupils.
- c) By using a scale of 2 cm to 5 kg on the x-axis and 1 cm to 1 pupil on the y-axis, draw a frequency polygon based on the data.

Answer:

a)

Mass(kg)	Frequency	Midpoint
30-34		

Table 5

b) i)

ii)

6. The data in Diagram 6 shows the monthly pocket money, in RM, received by 40 students.

32	41	46	56	42	48	51	39
36	47	54	59	34	54	52	48
49	51	62	58	38	63	49	43
56	44	60	64	52	53	55	35
45	38	48	57	44	49	46	40

- a) Based on the data in Diagram 6 and using a class interval of RM5, complete Table 6 in the answer space.
- b) From the table in a),
- iii) State the modal class,,
  - iv) Calculate the mean monthly pocket money of the students.
- c) By using a scale of 2 cm to RM5 on the x-axis and 2cm to 1 student on the y-axis, draw a histogram and a frequency polygon based on the data.

Answer:

a)

Pocket money(RM)	Frequency	Midpoint
31-35		
36-40		

Table 6

d) i)

ii)

**MODULE 8 – ANSWERS  
TOPIC: STATISTICS**

1)

a)

Body mass(kg)	Midpoint	Lower boundary	Upper boundary	Frequency
15-19	17	14.5	19.5	2
20-24	22	19.5	24.5	4
25-29	27	24.5	29.5	9
30-34	32	29.5	34.5	13
35-39	37	34.5	39.5	9
40-44	42	39.5	44.5	3

b) i) Modal class 30-34 kg

ii)  $9+3=12$

iii) Mean =  $\frac{(17 \times 2) + (22 \times 4) + (27 \times 9) + (32 \times 13) + (37 \times 9) + (42 \times 3)}{40}$

=  $1240/40$

= 31 kg

c) graph

d) graph

2)

a)

Marks	freq	Cumulative freq
11-15	1	1
16-20	3	4
21-25	6	10
26-30	10	20
31-35	11	31
36-40	7	38
41-45	2	40

b) graph

c) i) upper quartile  $\frac{3}{4} \times 40 = 30 = 35$

iii) 30 students scored less than 35

3)

a)

Age	Frequency	Midpoint
40-44	6	42
45-49	12	47
50-54	18	52
55-59	9	57
60-64	5	62

- b) Mean age = 51.5
- d) The modal age is 50-54 years old
- c) graph

4)

a)

Donation (RM)	Frequency	Cumulative frequency
10-19	5	5
20-29	8	13
30-39	11	24
40-49	13	37
50-59	3	40

- c) i) RM43.50
- ii) There are 10 persons who donated RM43,50 or more

b) graph

5)

a)

Mass(kg)	Frequency	Midpoint
30-34	2	32
35-39	10	37
40-44	12	42
45-49	8	47
50-54	5	52
55-59	3	57

b) i) 40-44 kg  
ii) 
$$\frac{(32 \times 2) + (37 \times 10) + (42 \times 12) + (47 \times 8) + (52 \times 5) + (57 \times 3)}{40}$$
$$= 1745/40$$
$$= 43.625 \text{ kg}$$

c) graph

6)

a)

Pocket money(RM)	Frequency	Midpoint
31-35	3	33
36-40	5	38
41-45	6	43
46-50	9	48
51-55	8	53
56-60	6	58
61-65	3	63

b) i) 46-50  
ii) mean = 
$$\frac{(33 \times 3) + (38 \times 5) + (43 \times 6) + (48 \times 9) + (53 \times 8) + (58 \times 6) + (63 \times 3)}{40}$$
$$= 1940/40$$
$$= 48.5$$

c) graph