ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 11

Unit 11: Basic Statistics — Exam Ready

25 multiple-choice questions Suggested time: **25 minutes** 1 mark each

Name: Date: Score: / 25

Circle one answer for each question. The answer key with explanations is on the last pages, so try every question before you check. These are practice questions, not official FBISE papers.

1. When a standard die is rolled, which event is certain?

(A) Getting a 6
(B) Getting an even number
(C) Getting a number greater than 3
(D) Getting a number less than 7

2. Why do the bars of a histogram touch each other?

(A) All the frequencies are equal
(B) The bars are drawn carelessly
(C) All the bars have the same height
(D) The class intervals are continuous, with no gaps between classes

3. The mean of 9 values is 20. A tenth value of 20 is added. What is the new mean?

(A) 40
(B) 20
(C) 18
(D) 22

4. To find the median class of grouped data, which class do we choose?

(A) The first class
(B) The class where the cumulative frequency first reaches or passes n/2
(C) The class with the largest class mark
(D) The class with the highest frequency

5. For an odd number n of ordered values, the median is the value at position:

(A) n + 1
(B) n/2
(C) (n − 1)/2
(D) (n + 1)/2

6. Classes 10 – 20, 20 – 30, 30 – 40 and 40 – 50 have frequencies 4, 6, 8 and 2. Find the mean.

(A) 30
(B) 580
(C) 29
(D) 145

7. Class 9A has 20 students with mean 60 and class 9B has 30 students with mean 70. Why is the combined mean not (60 + 70)/2 = 65?

(A) 60 and 70 must be multiplied
(B) The combined mean is always the larger mean
(C) The classes have different sizes, so each mean must be weighted by its number of students
(D) Means cannot be combined

8. Classes 10 – 20, 20 – 30, 30 – 40 and 40 – 50 have frequencies 4, 6, 8 and 2. Find the mode.

(A) 32.5
(B) 35
(C) 32
(D) 40

9. How many modes does the data 3, 3, 5, 7, 7 have?

(A) Two: 3 and 7
(B) None
(C) One: 7
(D) One: 3

10. Which of these is not a measure of central tendency?

(A) Mean
(B) Median
(C) Range
(D) Mode

11. Another name for relative frequency is:

(A) empirical (experimental) probability
(B) class mark
(C) theoretical probability
(D) expected frequency

12. The data 2, 4, 6, 10 has an even number of values. Which statement about its median is correct?

(A) It is 4, the lower middle value
(B) It is 5, the average of the two middle values, and it is not in the data
(C) It is 6, the higher middle value
(D) It is 10, the largest value

13. A bag has 3 red and 7 blue balls. A student writes P(red) = 3/7. What is the mistake?

(A) The denominator must be the total number of balls, 10, so P(red) = 3/10
(B) P(red) should be 3 × 7
(C) There is no mistake
(D) P(red) should be 7/10

14. The probability of any event always lies:

(A) from −1 to 1
(B) from 0 to 100
(C) from 0 to 1, both included
(D) strictly between 0 and 1

15. Why is P(E) = 1.5 impossible?

(A) The favourable outcomes cannot outnumber the total outcomes
(B) Because 1.5 is a decimal
(C) Probabilities must be whole numbers
(D) Because 1.5 is greater than 1/2

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16. Marks of five students are 40, 45, 50, 55 and 100. Which average represents a typical student better?

(A) The mean 58, because it is not affected by the mark 100
(B) The median 55, because it is the average of 50 and 55
(C) The median 50, because the mark 100 pulls the mean up to 58
(D) The mean 58, because it is the middle value

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17. The probability of rain on a day is 0.2. How many rainy days are expected in 150 days?

(A) 170
(B) 30
(C) 750
(D) 3

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18. The class mark of the class interval 20 – 30 is:

(A) 10
(B) 30
(C) 20
(D) 25

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19. If E′ is the complement of E, then P(E′) equals:

(A) 1/P(E)
(B) 1 + P(E)
(C) 1 – P(E)
(D) P(E) – 1

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20. Which data set has no mode?

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

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21. A coin is tossed 120 times and heads appears 45 times. Find the relative frequency of heads.

(A) 3/8
(B) 3/5
(C) 5/8
(D) 45

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22. Each value of a data set is multiplied by 3. What happens to the mean?

(A) It increases by 3
(B) It is divided by 3
(C) It stays the same
(D) It is multiplied by 3

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23. The class boundaries of the class interval 30 – 39 are:

(A) 29.5 and 39.5
(B) 30 and 39
(C) 29 and 40
(D) 30.5 and 38.5

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24. “It may rain tomorrow or not, so P(rain) = 1/2.” What is wrong with this reasoning?

(A) P(rain) must be 1

(B) The two outcomes are not necessarily equally likely

(C) P(rain) must be 0

(D) Complementary events cannot have probability 1/2

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25. A bag has 5 red, 3 green and 2 white balls. A ball is drawn at random. Find P(not green).

(A) 3/10

(B) 7/10

(C) 7/3

(D) 1/2

Answer key

Unit 11 · Exam Ready

1 D	**2** D	**3** B	**4** B	**5** D
6 C	**7** C	**8** A	**9** A	**10** C
11 A	**12** B	**13** A	**14** C	**15** A
16 C	**17** B	**18** D	**19** C	**20** D
21 A	**22** D	**23** A	**24** B	**25** B

Explanations

1. D. Getting a number less than 7
Every outcome 1 to 6 is less than 7, so this event has probability 1.

2. D. The class intervals are continuous, with no gaps between classes
Class boundaries join one class to the next, so the bars are adjacent.

3. B. 20
Adding a value equal to the mean does not change the mean: (180 + 20)/10 = 20.

4. B. The class where the cumulative frequency first reaches or passes n/2
The median is the middle value, so we locate the class that contains the n/2-th value.

5. D. (n + 1)/2
For example, with 5 values the median is the 3rd, and (5 + 1)/2 = 3.

6. C. 29
Class marks are 15, 25, 35 and 45. Σfx = 60 + 150 + 280 + 90 = 580 and Σf = 20, so mean = 29.

7. C. The classes have different sizes, so each mean must be weighted by its number of students
The combined mean is (20 × 60 + 30 × 70)/50 = 66.

8. A. 32.5
The modal class is 30 – 40, with l = 30, h = 10, f_m = 8, f_1 = 6 and f_2 = 2. Mode = 30 + (8 – 6)(10)/(16 – 6 – 2) = 32.5.

9. A. Two: 3 and 7
Both 3 and 7 occur twice, which is the highest frequency.

10. C. Range
Mean, median and mode are averages. Range measures spread.

11. A. empirical (experimental) probability
Relative frequency is calculated after performing an experiment, so it is called experimental or empirical probability.

12. B. It is 5, the average of the two middle values, and it is not in the data
The middle values are 4 and 6, so the median is (4 + 6)/2 = 5.

13. A. The denominator must be the total number of balls, 10, so P(red) = 3/10
The total number of outcomes is 3 + 7 = 10, not 7.

14. C. from 0 to 1, both included
Probability values are from 0 to 1, and the end values 0 and 1 are included.

15. A. The favourable outcomes cannot outnumber the total outcomes
P(E) = favourable ÷ total, and favourable cannot exceed total, so P(E) cannot exceed 1.

16. **C. The median 50, because the mark 100 pulls the mean up to 58**
The median is the middle value, 50. The mean is 290/5 = 58, and it is pulled upwards by the mark 100.

17. **B. 30**
Expected frequency = 150 × 0.2 = 30.

18. **D. 25**
Class mark = (20 + 30)/2 = 25.

19. **C. 1 − P(E)**
Complementary events have probabilities that sum to unity.

20. **D. 1, 2, 3, 4, 5**
When every value occurs only once, no value is most frequent.

21. **A. 3/8**
Relative frequency = 45/120 = 3/8.

22. **D. It is multiplied by 3**
The sum becomes 3 times as large and n does not change, so the mean becomes 3 times as large.

23. **A. 29.5 and 39.5**
Boundaries lie halfway in the gap between classes, so they are 29.5 and 39.5.

24. **B. The two outcomes are not necessarily equally likely**
The formula favourable ÷ total works only when the outcomes are equally likely.

25. **B. 7/10**
P(green) = 3/10, so P(not green) = 1 − 3/10 = 7/10.

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