

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X

ANNUAL EXAMINATIONS 2022

General Mathematics

Time: 1 hour 40 minutes Marks: 50

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 50 only.
4. In each question, there are four choices A, B, C, D. Choose ONE. On the answer grid, black out the circle for your choice with a pencil as shown below.

Correct Way	Incorrect Ways
1 (A) (B) ● (D)	1 (A) (B) (C) (D)
	2 (A) (B) (C) (D)
	3 (A) (B) (C) (D)
	4 (A) (B) (C) (D)

Candidate's Signature

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. The marks obtained on the 50 MCQs will be equated to the total marks of 75 for the theory examination results.
8. You may use a simple calculator if you wish.

1. The price of an iPad is Rs 50,000. Amina bought it on a certain down payment. She paid the remaining amount in 9 equal monthly instalments of Rs 4,000. The percentage of the total amount that she paid as down payment is
- A. 8%.
B. 14%.
C. 28%.
D. 72%.
2. Aman's monthly expenditure break up is shown in the given table.

Education and Health (Rs)	Other Expenses (Rs)	Monthly Utilities (Rs)
25,000	20,000	25,000

If his net monthly saving is Rs 50,000, then the monthly income is

- A. Rs 50,000
B. Rs 70,000
C. Rs 100,000
D. Rs 120,000
3. Alia took a loan of Rs 10,000 at a simple interest rate of c % per year. She paid back a total amount of Rs 12,000 in 2.5 years. In the given situation, the value of c is
- A. 0.55
B. 0.67
C. 6.67
D. 8.00
4. On a certain day, the conversion rate of Rs 100 into other currencies is given in the table.

US \$	Chinese Yuan	Turkish Lira
0.6	3.92	5.07

Using the given information, 50 Turkish Lira, in rupees, is equal to

- A. Rs 19.72
B. Rs 10.14
C. Rs 253.50
D. Rs 986.19
5. On a principal amount of Rs 25,000, 5% per annum simple interest was charged. If the loaning period is 5 years, then the interest earned is
- A. Rs 1,250
B. Rs 6,250
C. Rs 12,500
D. Rs 62,500

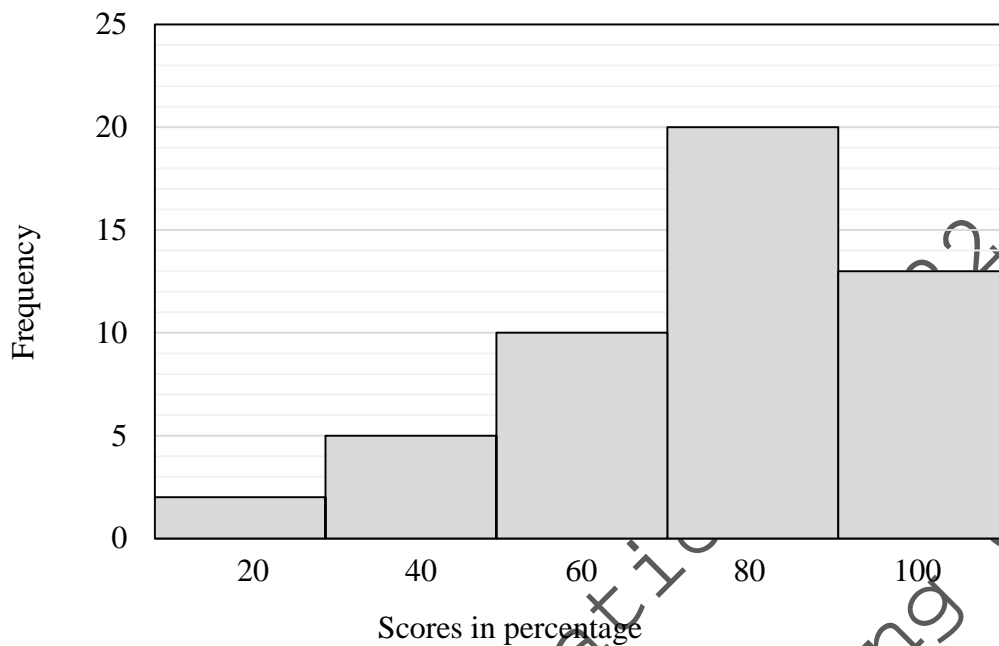
6. Which of the following is an example of an indirect tax?
- vehicle tax
 - Income tax
 - Property tax
 - General sales tax
7. Akram's monthly taxable income is Rs 350,000. If he pays a monthly tax of Rs 50,000, then the tax rate is
- 10.28%.
 - 12.67%.
 - 14.28%.
 - 16.67%.
8. The given table shows the rate per unit of electricity charges for different slabs.

0 - 100 units	101 - 200 units	201 - 500 units	501 and more units
Rs 2.6/ unit	Rs 3.6/ unit	Rs 6.1/ unit	Rs 7.4/ unit

The electricity consumption of Jamila's house is 350 units in a certain month. The electricity charges he pays for this month is

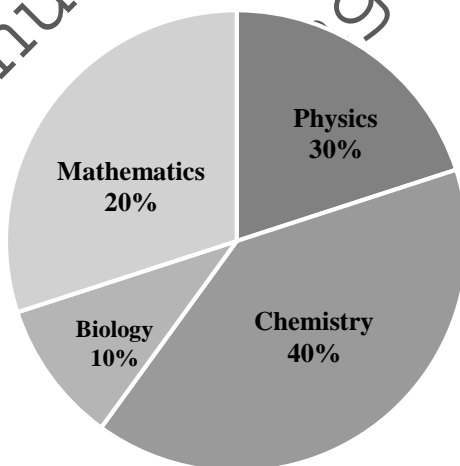
- Rs 910
 - Rs 1,260
 - Rs 1,535
 - Rs 1,632
9. A man works in a company and earns Rs 250 per hour for 8 hours a day. He earns Rs 300 per hour for each additional hour of work. On a particular day, his total income was Rs 3,200. How long did he work on that day?
- $10\frac{1}{2}$ hours.
 - $10\frac{2}{3}$ hours
 - 12 hours.
 - 14 hours.
10. Karima's monthly salary is Rs 75,000, which is expected to increase by 15%. Her new salary will be
- Rs 11,250
 - Rs 63,750
 - Rs 86,250
 - Rs 87,750

11. The given histogram shows the scores (in percentage) of students in a class.



The number of students who scored above 40% is

- A. 7
 - B. 20
 - C. 32
 - D. 43
12. The pie chart shows the percentages of students' liking of different subjects in a class.



If 8 students like mathematics, then the total number of students in the class is

- A. 20
- B. 32
- C. 40
- D. 100

Use the given frequency distribution to answer Q.13 and Q.14.

13. The given table shows the age group of staff working in a certain company.

Age (in Years)	26 - 30	31 - 35	36 - 40	41 - 45	46 - 50
Number of Employees	6	15	22	7	4

The number of staff below or equal to 40 years of age is

- A. 15
B. 21
C. 22
D. 43
14. The number of staff between 31 and 45 years of age is
- A. 15
B. 22
C. 37
D. 44
15. A data consists of 5 observations. The sum of 4 observations is 62. If the average of the data is 16, then the fifth observation will be
- A. 12.4
B. 13.0
C. 15.5
D. 18.0
16. The given table shows the distribution of the scores of a player in the first 50 matches of her batting career.

Runs Scored	15 – 20	21 – 25	16 – 30	31 – 35	36 – 40
Number of Matches	4	11	16	10	9

Using the table, the cumulative frequency of the median class is

- A. 15
B. 16
C. 31
D. 41

17. For the data 6, 7, 10, 11, 11, 13, 16, 18 and 25, if $\sum(x - \bar{x})^2 = 280$, then the standard deviation will be

(Note: $\sigma^2 = \frac{\sum(x - \bar{x})^2}{n}$)

- A. 1.9
 B. 5.6
 C. 31.1
 D. 93.3
18. The highest common factor (HCF) of the polynomials $(x - 2y)^2$ and $x^2 - 4y^2$ is
- A. $x - 2y$.
 B. $x + 2y$.
 C. $(x + 2y)(x - 2y)$.
 D. $(x + 2y)(x - 2y)^2$.
19. The highest common factor (HCF) of the polynomials a^2 , $a(a^2 - 1)$ and $a^2 - 2a + 1$ is
- A. 1
 B. $a - 1$
 C. $a(a - 1)$
 D. $a^2(a - 1)(a + 1)$
20. The least common multiple (LCM) of the polynomials $(1 - 2y)^2(1 + 2y)$ and $1 - 4y^2$ is
- A. $(1 + 2y)^2(1 - 2y)^2$.
 B. $(1 + 2y)(1 - 2y)^2$.
 C. $(1 - 2y)(1 + 4y^2)$.
 D. $(1 + 2y)(1 - 4y^2)$.
21. The simplest form of the expression $\frac{(x - 3y)^2}{x^2 + 9y^2} \times \frac{(x + 3y)^2}{(x + 3y)(x - 3y)}$ is
- A. 1
 B. $\frac{x - 3y}{x + 3y}$
 C. $\frac{x^2 - 9y^2}{x^2 + 9y^2}$
 D. $\frac{((x - 3y)(x + 3y))^2}{x^4 - 81y^4}$

22. The square root of the expression $4(x-a)(x+a)(x^2-a^2)$ is
- $\pm(x-a)$.
 - $\pm(x^2-a^2)$.
 - $\pm 2(x-a)$.
 - $\pm 2(x^2-a^2)$.
23. If $x^4 - 6x^2 + a$ is a perfect square, then the possible value of a will be
- 9
 - 3
 - 3
 - 9
24. The least common multiple (LCM) of two polynomials $p(x)$ and $q(x)$ is $(x+3y)(x^2+4xy+4y^2)$. If their highest common factor (HCF) is $x+2y$ then their product $p(x) \times q(x)$ will be
- $(x+2y)(x+3y)$.
 - $(x+2y)^2(x+3y)$.
 - $(x+2y)^2(x+3y)^2$.
 - $(x+2y)^3(x+3y)$.
25. The highest common factor (HCF) of the polynomials x^2+6x+9 and $(x+3)^3$ is
- 1
 - $x+3$
 - $(x+3)^2$
 - $(x+3)^3$
26. The sum $\frac{x-y}{x+y} + \frac{x+y}{x-y}$ is equal to
- $\frac{2x}{x^2-y^2}$.
 - $\frac{2y}{x^2-y^2}$.
 - $\frac{4xy}{x^2-y^2}$.
 - $\frac{2(x^2+y^2)}{x^2-y^2}$.

27. The solution of the linear equation $\frac{x+a}{a} - 1 = 0$ is

- A. 0
- B. 1
- C. $1 - a$
- D. $2a$

28. The solution set of the radical equation $\frac{\sqrt{x-1}}{3} - \frac{1}{2} = 0$ is

- A. $\left\{\frac{3}{2}\right\}$.
- B. $\left\{\frac{9}{4}\right\}$.
- C. $\left\{\frac{10}{4}\right\}$.
- D. $\left\{\frac{13}{4}\right\}$.

29. The solution set of the radical equation $\frac{1}{\sqrt{x-1}} - \frac{1}{2} = 0$, where $x \neq 1$, is

- A. $\left\{\frac{3}{4}\right\}$.
- B. $\left\{\frac{5}{4}\right\}$.
- C. $\left\{\frac{3}{5}\right\}$.
- D. $\left\{\frac{5}{3}\right\}$.

30. If three more than twice of a number is 5, then the number is

- A. -6
- B. -1
- C. 1
- D. 6

31. The solution set of the absolute equation $|x+4| - 1 = 0$ is

- A. $\{\}$.
- B. $\{3, -5\}$.
- C. $\{-3, 5\}$.
- D. $\{-3, -5\}$.

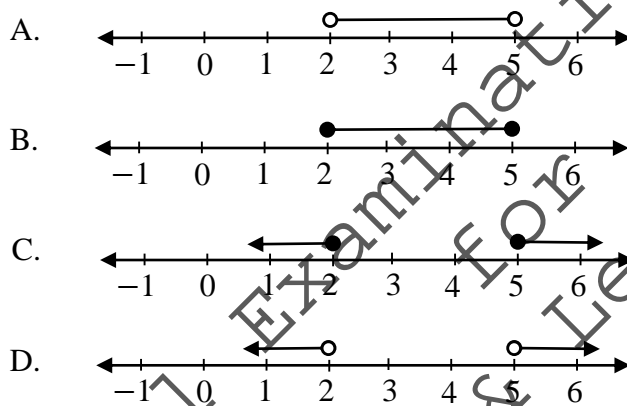
32. The solution set of the equation $\frac{2|x-1|}{3} = 4$ is

- A. $\{5,3\}$.
- B. $\{5,7\}$.
- C. $\{-5,7\}$.
- D. $\{-5,-7\}$.

33. The solution of linear inequality $5 - 2x < -5$ is

- A. $x < 0$
- B. $x > 0$
- C. $x < 5$
- D. $x > 5$

34. The number line that represents the statements $x < 2$ and $x > 5$ is



35. The solution of $-1 < \frac{x+2}{4}$ is

- A. $x < -6$
- B. $x > -6$
- C. $x > 6$
- D. $x < 6$

36. Which of the following represent(s) quadratic equation(s)?

I. $\frac{2x-1}{x+2} = \frac{1}{x}$

II. $\frac{2x-1}{x+2} = \frac{5}{4}$

III. $2(x-2)^2 = 2x^2 + 3x$

- A. I only.
- B. II only.
- C. I and II.
- D. II and III.

37. What should be added to make the expression $x(x+2)-5$ a perfect square?

- A. -6
- B. -5
- C. 5
- D. 6

38. On comparison of $(x-2)(x+2)-5=0$ with $ax^2+bx+c=0$, $a \neq 0$, the values of a and b respectively are

- A. 1 and 9
- B. 1 and 0
- C. 1 and -9
- D. -4 and -5

39. One of the solution of the quadratic equation $x(x-6)=-9$ is 3. The other solution will be

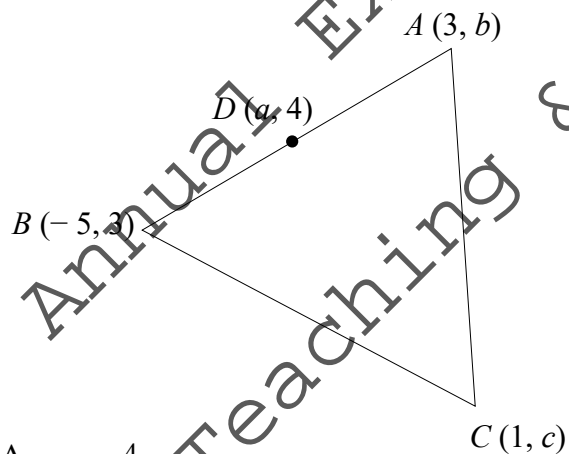
- A. -3
- B. 0
- C. 3
- D. 9

40. The length of a rectangle is 5 cm more than the twice of its width. If the width of the rectangle is x cm and the area of the rectangle is 36 cm^2 , then the quadratic equation that represents this situation is

- A. $x^2 + 5x - 36 = 0$
- B. $x^2 - 5x + 36 = 0$
- C. $2x^2 + 5x - 36 = 0$
- D. $2x^2 - 5x - 36 = 0$

41. If 5 is the arithmetic mean between two numbers p and q , then the relation between p and q will be
- A. $\sqrt{pq} = 5$
 - B. $pq = 5$
 - C. $p + q = 10$
 - D. $2p + 2q = 5$
42. If 3, 5 and p are three consecutive terms of a geometric sequence, then the value of p is
- A. $\frac{25}{3}$.
 - B. $\frac{3}{25}$.
 - C. $\frac{5}{3}$.
 - D. $\frac{3}{5}$.
43. The $(n - 1)^{\text{th}}$ term of a geometric sequence, in which the first term is a and common ratio is r will be
- A. ar^{n-2}
 - B. ar^{n-1}
 - C. ar^n
 - D. ar^{n+1}
44. The general term of the sequence 0, 3, 8, 15, ..., is represented as
- A. $n^2 - 1$
 - B. $1 - n^2$
 - C. $2n - 2$
 - D. $4n - 4$
45. Which of the following sequences is an arithmetic sequence?
- A. $a, a + 3, a + 6, a + 9, \dots$
 - B. $a, (a + 1)^2, (a + 2)^2, (a + 3)^2 \dots$
 - C. $a, a + 1, a + 3, a + 5, \dots$
 - D. $2a, 2a + 3, 2a + 9, \dots$

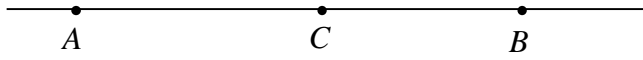
46. The n^{th} term of the arithmetic sequence 2, 9, 16, 23, ... is
- A. $2 + 7(n - 1)$
B. $7 + 2(n - 1)$
C. $2 + 7n$
D. $2 - 7n$
47. The distance between the two points $(3, -6)$ and $(-6, 3)$ is
- A. 6 units.
B. 18 units.
C. $3\sqrt{2}$ units.
D. $9\sqrt{2}$ units.
48. The two points $(a, 3)$ and $(0, -3)$ are at an equal distance from $(\frac{3}{2}, 0)$. If the three points lie on a single line, then the value of a is
- A. 0
B. 3
C. 6
D. 9
49. In the given figure, A , B and C are the vertices of the triangle ABC . If D is the midpoint of AB , then the value of a is



NOT TO SCALE

- A. -4
B. -1
C. 4
D. 5

50. In the given figure, A , B and C are three collinear points.



NOT TO SCALE

The condition A , B and C satisfy is

- A. $AB + BC = AC$
- B. $AC + BC = AB$
- C. $AB + AC = BC$
- D. $AB = 2BC$

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