AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X

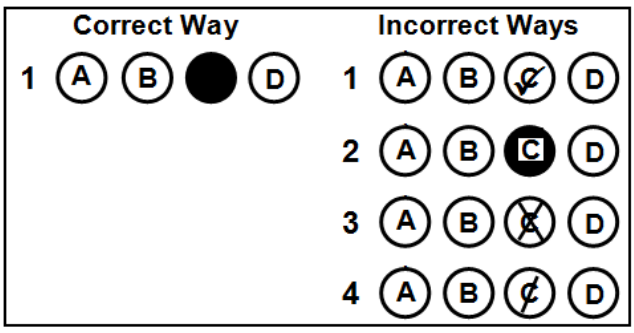
ANNUAL EXAMINATIONS 2021

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.



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. If Rs x becomes Rs $\frac{3}{2}x$ at a simple interest rate of c % per annum, then the duration of the investment will be

   A. $\frac{100}{c}$
   B. $\frac{c}{100}$
   C. $\frac{c}{50}$
   D. $\frac{50}{c}$

2. If an amount of Rs 100,000 earns a simple interest of 10% per annum in 10 years, then the interest on the investment will be Rs

   A. 10,000
   B. 100,000
   C. 1,000,000
   D. 10,000,000

3. If an interest of Rs 12,000 is earned at a simple interest rate of 8% per annum in 6 years, the principal amount of the investment should have been Rs

   A. 2,500
   B. 5,760
   C. 16,000
   D. 25,000

Use the given information to answer Q.4 and Q.5.

Sultan plans to buy a new car on instalments from a bank. The payment details of the bank are given in the table.

S. No.	Payment	Detail
1	Price of the Car	Rs 2,500,000
2	Interest of the Bank	20% of the Price of the Car
3	Down Payment	25% of (Price of the Car + Interest of the Bank)
4	Bank Processing Fee	Rs 2,500 (At the beginning of the Purchase)
5	Instalment Period	3 Years
6	Number of Equal Monthly Instalments	36

4. The down payment he has to make is Rs

   A. 750,000
   B. 752,500
   C. 625,000
   D. 627,500

5. The monthly instalment of the car will be Rs

   A. 62,430
   B. 62,500
   C. 83,403
   D. 104,236

6. Adeel bought a washing machine on instalments. The price of the washing machine is Rs 36,000. He paid 10% of the price as a down payment. The remaining amount will be paid in 10 monthly instalments. The amount of each monthly instalment will be Rs

   A. 3,240
   B. 3,564
   C. 3,600
   D. 3,960

7. The price of a painting is Rs 10,000 and a discount of 10% is offered. If a sales tax of 10% levied on the discounted price of the painting, then the price of the painting, including sales tax, will be Rs

   A. 9,000
   B. 9,900
   C. 10,000
   D. 11,000

8. The sales tax on bag, wallet and key chain is 7%, 6% and 5% respectively. The price of a bag, a wallet and a keychain is Rs 5,000, 1,500 and 500 respectively. If Samra bought ONE bag, ONE wallet and TWO key chains, then the total sales tax she paid is Rs

   A. 420
   B. 450
   C. 465
   D. 490

9. Saima is working in an IT company. As per her contract, she will be paid Rs 1,500 per hour as her professional fees. Every week she is bound to work for 40 hours. For each additional hour, she will be paid two times of the professional fees.

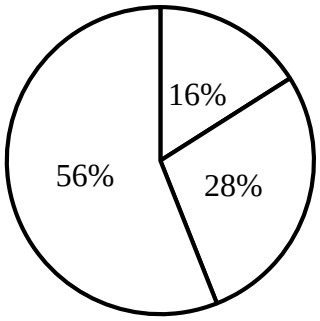
   If for a certain week she works for 45 hours, then her total fees for the week will be Rs

   A. 67,500
   B. 75,000
   C. 127,500
   D. 135,000

10. Siraj is a salesperson at an electronic store. His fixed salary is Rs 20,000 and he earns a commission of 5% on every sale he makes. In the month of March, he sold two washing machines each of price Rs 35,700 and five refrigerators of total price Rs 190,000. His total income for this month will be Rs

A. 25,470
B. 33,070
C. 31,285
D. 12,285

11. In the given pie chart, the angle corresponding to the largest sector is



A. 56°
B. 100.8°
C. 201.6°
D. 270°

12. The values a, 2, 4, 6, b, b, 11 and c are in ascending order. If the median of these values is 8, then the value of b is

A. 8
B. 8.5
C. 9
D. 10

13. The mode of the values x+1, x + 2, x + 3, x + 3, x + 5, x + 7, x + 9, x + 9, x + 3 and x + 1 is 7, then the value of x is

A. 0
B. 4
C. 7
D. 16

Use the given frequency distribution to answer Q.14 and Q.15.

Class Interval	Frequency
15 - 19	12
20 - 24	14
25 - 29	18
30 - 34	16
35 - 39	13

14. The cumulative frequency of the class interval that has the highest frequency is

A. 18
B. 26
C. 44
D. 47

15. The upper class boundary of the class interval which has the lowest frequency is

A. 18.5
B. 19.0
C. 19.5
D. 20.0

16. For a set of data, $\sum X = 23$ and $\sum X^2 = 83$ and $N = 7$, the variance of the data is

(**Note**: Answer is given up to two decimal places.)

A. 1.06
B. 1.03
C. 63.71
D. 7.98

17. If the mean of the values 5, 6, 8, 7, x and $3x$ is 10, then the value of x will be

A. 4.25
B. 8.5
C. 15
D. 30

18. The highest common factor (HCF) of $(x - a)^2$ and $x^2 - a^2$ is

A. 1
B. $x - a$
C. $(x - a)^2$
D. $x^3 - a^3$

19. The least common multiple (LCM) of $(y-2)^2$ and (y^2-4) is

A. $y-2$
B. $(y-2)^2$
C. $(y-2)(y-2)^2$
D. $(y-2)(y^2-4)$

20. The highest common factor (HCF) and least common multiple (LCM) of two polynomials are $(x-3)(x^2-9)$ and $(x-3)$ respectively. The product of the two polynomials will be

A. (x^2-9)
B. $(x-3)(x^2-9)$
C. $(x-3)^2(x^2-9)^2$
D. $(x-3)^2(x^2-9)$

21. On simplification of $\frac{x}{2}\left(\frac{1}{x}-2\right)\div\frac{1}{2}$, we get

A. $(1-2x)$.
B. $(2x-1)$.
C. $\frac{(1-2x)}{4}$.
D. $\frac{(2x-1)}{4}$.

22. On simplification of $1-\frac{a^2-b^2}{(a-b)^2}$, we get

A. $\frac{-2b}{a-b}$.
B. $\frac{-2a}{a-b}$.
C. $\frac{2a}{a-b}$.
D. $\frac{2b}{a-b}$.

23. $\sqrt{(a-2)(a^2-4)(a+2)(a+2)^2}$ is equal to

A. $(a-2)(a+2)^2$
B. $(a-2)^2(a^2-4)$
C. $(a+2)^2(a^2-4)$
D. $(a+2)^2$

24. The positive square root of $x^2(x^2 - 2x + 1)$ is

A. $x(x + 2)$.
B. $x(x + 1)$.
C. $x(x - 2)$.
D. $x(x - 1)$.

25. The least common multiple of $3x$, $6y$ and $6xy$ is

A. $6xy$
B. $18xy$
C. $6x^2y^2$
D. $18x^2y^2$

26. On simplification of $\frac{(x-y)^2 \times (x+y)^2}{x^2 - y^2}$, we get

A. $(x-y)^2$
B. $(x+y)^2$
C. $x^2 - y^2$
D. $x^2 + y^2$

27. If we solve $2x - \frac{5}{3} = \frac{10}{6}$, then the value of x will be

A. $\frac{5}{4}$
B. 0
C. $\frac{5}{6}$
D. $\frac{5}{3}$

28. The solution set of $\frac{x}{a} + a = \frac{1}{a}$ is

A. $\{1-a\}$.
B. $\{1+a\}$.
C. $\{1-a^2\}$.
D. $\{1-a, 1+a\}$.

29. The solution set of $\sqrt{x-3} - 3 = 3$ is

A. $\{\pm 9\}$.
B. $\{\pm 39\}$.
C. $\{9\}$.
D. $\{39\}$.

30. The value of x for $\frac{\sqrt{x-b}}{b}-b=0$ is

A. b^4+b.

B. b^2+b.

C. b^2-b.

D. b^4-b.

31. The sum of two consecutive odd numbers is 156. The smaller of two numbers is

A. 75
B. 77
C. 79
D. 81

32. The solution set of $|5-5x|=5$ is

A. { }.
B. {0}.
C. {0, 2}.
D. {0, – 2}.

33. The solution set of $|2x-1|=2$ is

A. $\left\{\frac{3}{2}\right\}$.

B. $\left\{-\frac{1}{2}\right\}$.

C. $\left\{-\frac{3}{2},\frac{1}{2}\right\}$.

D. $\left\{-\frac{1}{2},\frac{3}{2}\right\}$.

34. The values of x which satisfy $1-2x<-3$, where $x\in R$, is

A. $x<2$
B. $x>1$
C. $x<1$
D. $x>2$

35. The values of x which satisfy the inequality $1-\frac{x}{2}<-\frac{1}{2}$, where $x\in R$, is

A. $x<1$
B. $x>2$
C. $x<2$
D. $x>3$

36. Which of the given options represents a quadratic equation?

A. $\frac{2x+1}{x+3}=x$

B. $\frac{2x+1}{x+3}=1$

C. $\frac{2x+1}{3}=x$

D. $\frac{(2x+1)^2}{2x+1}=x$

37. The values of x for $\frac{x^2}{48}-3=0$ are

A. $\pm\frac{1}{4}$

B. ± 4

C. ± 12

D. ± 16

38. The standard quadratic form of $\frac{x+1}{x}=x-1$ is

A. $x^2-2x-1=0$

B. $x^2+x-1=0$

C. $x^2-2x+1=0$

D. $x^2-x+1=0$

39. The term should be added to make $4x^2+4x-1,$ a perfect square is

A. 0

B. 1

C. 2

D. 5

40. The values of the x for $x^2-px-1=0$ are

A. $\frac{-p\pm\sqrt{p^2-4}}{2}$

B. $\frac{-p\pm\sqrt{p^2+4}}{2}$

C. $\frac{p\pm\sqrt{p^2+4}}{2}$

D. $\frac{p\pm\sqrt{p^2-4}}{2}$

41. The general term of the sequence $a^2, -a^3, a^4, -a^5, a^6, -a^7, \ldots$ is

A. $-(a)^{n+1}$
B. $-(a)^n$
C. $(-a)^n$
D. $(-a)^{n+1}$

42. If the first term and the common difference of an arithmetic progression are equal to each other and the 7^{th} term is 21, then the first term will be

A. 3
B. $\frac{21}{8}$
C. -3
D. $-\frac{21}{8}$

43. If the sum of first three terms of an arithmetic progression is 15 and common difference is 3, then the first term will be

A. 1
B. 2
C. 3
D. 4

44. For the arithmetic sequence $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, \frac{5}{4}, \ldots$ the 20^{th} term is

A. $\frac{21}{4}$
B. 4
C. $\frac{9}{2}$
D. 5

45. The first term of a geometric sequence is $\frac{5}{2}$ and common ratio is $\frac{3}{2}$. The 4^{th} term of the sequence is

A. $\frac{135}{16}$
B. $\frac{475}{16}$
C. $\frac{405}{32}$
D. $\frac{2375}{32}$

46. When two geometric means are inserted between 5 and 40, the sequence becomes 5, *a*, *b*, 40. The common ratio of the sequence will be

A. 2
B. $2\sqrt{2}$
C. 4
D. 8

47. If the distance between points (0, *a*) and (8, 0) is 10 units, then *a* is equal to

A. ± 2
B. ± 6
C. 36
D. 92

48. The distance between points (1, 2) and (2, 1) is

A. 0
B. 1
C. $\sqrt{2}$
D. $\sqrt{3}$

49. The points *B* (6, 3) and *C* (2, *t*) are the end points of a line segment *BC*. If *A* (4, 6) is the midpoint of *BC*, then *t* is equal to

A. 5
B. 6
C. 9
D. 10

50. The midpoint of the points (2, 3) and $(-4,-2)$ is

A. $\left(3, \frac{5}{2}\right)$.
B. $\left(-1, \frac{1}{2}\right)$.
C. $\left(-1, -\frac{1}{2}\right)$.
D. $\left(-3, -\frac{5}{2}\right)$.

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