

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

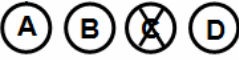
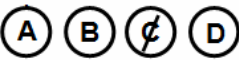
MAY 2014

Mathematics Paper I

Time: 40 minutes Marks: 30

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 30 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		1	
		2	
		3	
		4	

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. You may use a simple calculator if you wish.

1. $3 - i - (2 - i)$ is equal to

Note: $i = \sqrt{-1}$

- A. 1
- B. $1 + 2i$
- C. -1
- D. $-1 - 2i$

2. The expression $\sqrt[5]{x^5 y^5}$ is equal to

- A. $x^{25} y^{25}$
- B. $x^{10} y^{10}$
- C. $x^5 y^5$
- D. xy

3. If $a + b = 0 = b + a$, then a is said to be the

- A. additive identity of b .
- B. additive inverse of b .
- C. multiplicative identity of b .
- D. multiplicative inverse of b .

4. $(2y)^3$ is equal to

- A. $2y^3$
- B. $6y^3$
- C. $6y$
- D. $8y^3$

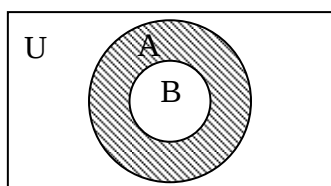
5. If $N = \{1, 2, 3, 4, 5, \dots\}$ and $R = \{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$, then $N \cap R$ is equal to

- A. $\{1, 2, 3, 4, 5, \dots\}$
- B. $\{1, 2, 3\}$
- C. $\{0, 1, 2, 3, \dots\}$
- D. $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

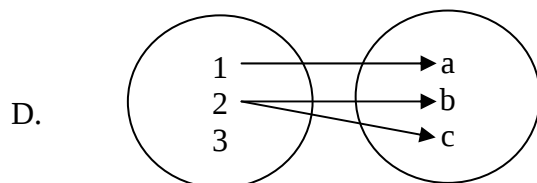
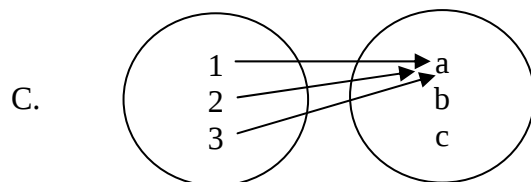
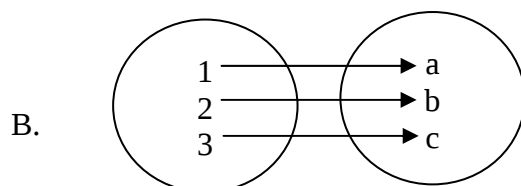
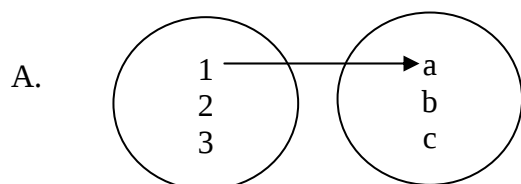
6. For $X = \{1, 2, 3\}$ and $Y = \{4, 5, 6\}$, $X - Y$ is equal to

- A. $\{ \}$
- B. $\{1, 2, 3\}$
- C. $\{4, 5, 6\}$
- D. $\{1, 2, 3, 4, 5, 6\}$

7. The shaded area in the given Venn diagram represents



- A. $A \cup B$
 B. $A \cap B$
 C. $B - A$
 D. $A - B$
8. Which of the following is a one-one function?



9. $100 \times 3 \times 10^{-5}$ is equal to

- A. 3×10^{-7}
 B. 3×10^{-6}
 C. 3×10^{-3}
 D. 3×10^{-2}

10. $a^{-1} = \frac{1}{a}$ can be written in logarithmic form as
- A. $\log_a \frac{1}{a} = -1$
 - B. $\log_a a = -1$
 - C. $\log_a \frac{1}{a} = 1$
 - D. $\log_a a = 1$
11. In the simplest form $\frac{1+2x+x^2}{1+x}$ is equal to
- A. $x(1+x)$
 - B. $x(2+x)$
 - C. $1+x$
 - D. $2+x$
12. Which of the following expressions is NOT a rational expression?
- A. $\frac{1}{x-1}$
 - B. $\frac{1}{x^2-1}$
 - C. $\frac{1}{\sqrt{(x-1)^2}}$
 - D. $\frac{1}{\sqrt{x^2-1}}$
13. $(a+2b+c)^2$ is equal to
- A. $a^2 + 2b^2 + c^2 + 2ab + 2bc + 2ca$
 - B. $a^2 + 4b^2 + c^2 + 4ab + 2bc + 2ca$
 - C. $a^2 + 4b^2 + c^2 + 4ab + 4bc + 2ca$
 - D. $a^2 + 2b^2 + c^2 + 4ab + 4bc + 2ca$
14. On factorizing $3a - 6a^2 + 9a^3$ we get
- A. $3a(1 - 2a + 3a^2)$
 - B. $3a(3 - 6a + 9a^2)$
 - C. $3a(-2a + 3a^2)$
 - D. $3a(1 - 3a + 6a^2)$

15. The factors of $(x+1)^2 - 1$ are

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

16. One of the factors of $x^3 + x^2 - x - 1$ is

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

17. If $y = \frac{k}{x}$, then by using the following table the value of k is

x	3	2
y	6	9

- A. $\frac{1}{2}$
- B. $\frac{9}{2}$
- C. 2
- D. 18

18. If s varies inversely as y^2 and $s = a$ and $y = b$, then the value of the proportionality constant is

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

19. If $A = \begin{bmatrix} c & 0 \\ 3 & 1 \end{bmatrix}$ is a singular matrix, then c is equal to

- A. -3
- B. -1
- C. 0
- D. 3

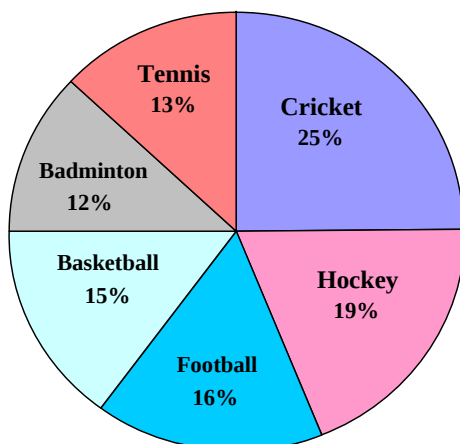
20. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is a symmetric matrix, then A^t is equal to

- A. $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$
- B. $\begin{bmatrix} -a & -b \\ -c & -d \end{bmatrix}$
- C. $\begin{bmatrix} -a & b \\ c & -d \end{bmatrix}$
- D. $\begin{bmatrix} a & -b \\ -c & d \end{bmatrix}$

21. $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix} \times \begin{bmatrix} 1 \\ 1 \end{bmatrix}$ is equal to

- A. $\begin{bmatrix} 2 & 2 \end{bmatrix}$
- B. $\begin{bmatrix} 2 \\ 2 \end{bmatrix}$
- C. $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$
- D. $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

The given pie chart provides information about the liking of different sports in a certain school. Read the chart carefully to answer Q22 and Q23.



22. What is the central angle of the sector corresponding to the liking of basketball?

- A. 15°
- B. 24°
- C. 26°
- D. 54°

23. According to the given data, the least favourite sport is

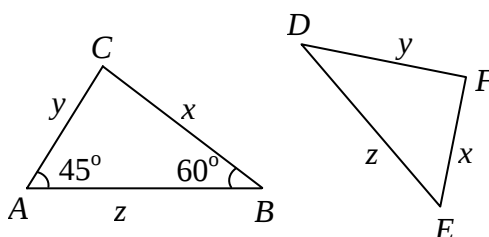
- A. cricket.
- B. hockey.
- C. badminton.
- D. tennis.

24. Which of the following statistical measurements may have more than one value?

- A. Mean
- B. Median
- C. Mode
- D. Range

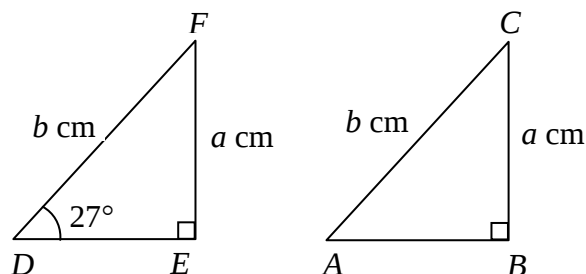
25. For the given triangles, $m\angle F$ is equal to

- A. 45°
- B. 60°
- C. 65°
- D. 75°



NOT TO SCALE

26. For the given two triangles ABC and DEF , $m\angle C$ is equal to

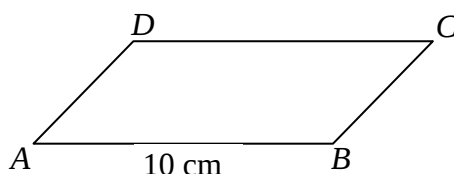


NOT TO SCALE

- A. 27°
- B. 33°
- C. 63°
- D. 67°

27. If the perimeter of the given parallelogram $ABCD$ is 30 cm, then $m\overline{BC}$ is equal to

- A. 5 cm
- B. 10 cm
- C. 15 cm
- D. 20 cm



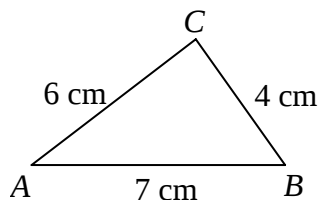
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28. Any point equidistant from the end points of a line segment is on the

- A. bisector.
- B. angle bisector.
- C. right bisector.
- D. median.

29. In the given triangle ABC , which of the following conditions is TRUE?

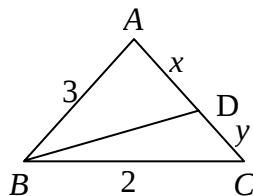
- A. $m\angle A > m\angle B$
- B. $m\angle B > m\angle C$
- C. $m\angle A > m\angle C$
- D. $m\angle C > m\angle B$



NOT TO SCALE

30. If $\overline{BD}$ is the internal bisector of $\angle ABC$, then the ratio of $x : y$ is

- A. 1 : 2
- B. 3 : 1
- C. 2 : 3
- D. 3 : 2



NOT TO SCALE