

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

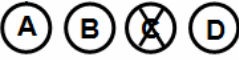
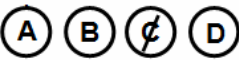
MAY 2013

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. Which of the following fractions is a terminating decimal fraction?

- A. $\frac{4}{3}$
- B. $\frac{3}{4}$
- C. $\sqrt{3}$
- D. $\frac{1}{\sqrt{3}}$

2. If a is the multiplicative inverse of b , then

- A. $\frac{1}{a} = -b$
- B. $a = -b$
- C. $ab = 0$
- D. $ab = 1$

3. $\frac{2^n}{2^{n+1} - 2^n}$ is equal to

- A. $\frac{1}{2^n - 1}$
- B. $\frac{1}{2}$
- C. 1
- D. -1

4. If $z = \sqrt{-1-i}$, then the conjugate of z^2 is

- A. $\sqrt{-1+i}$
- B. $\sqrt{1+i}$
- C. $-1+i$
- D. $1+i$

5. If $K = \{2,3\}$, $L = \{2,3\}$ and $K \cap M = L$, then which of following options is true for set M ?

- I. $\{2,3\}$
- II. $\{1,3,5\}$
- III. $\{1,2,3,6\}$

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

6. If $E \cup F = \{a, b, c, d, e\}$ and $E \cap F = \{b, d, e\}$, then $E \Delta F$ is equal to

- A. $\{e\}$
- B. $\{a, c\}$
- C. $\{b, d\}$
- D. $\{a, b, c, d, e\}$

7. For set E , which of the following conditions is FALSE?

- A. $E \cup E = E$
- B. $E \cap E = E$
- C. $E \cup \phi = E$
- D. $E \cap \phi = E$

8. Which of the following statements is TRUE?

- A. Every relation is a function.
- B. Every function is a one-one correspondence.
- C. A one-one correspondence is a bijective function.
- D. An onto and a one-one function is a surjective function.

9. $\log_a y = x$ is possible only when

- I. $a > 0$ and $y > 0$
- II. $a \neq 1$
- III. $y < 0$

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

10. If $\log_{1+a} a^2 = 1$, then

- A. $a^2 = 1$
- B. $a^2 = 2 + 2a$
- C. $a^2 = 1 + a$
- D. $a^2 = 1 - a$

11. The value of an algebraic expression $\sqrt{2}x - 1$, when $x = \frac{1}{\sqrt{2}}$, is

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

12. If $(m+n)^2 - (m-n)^2 = 16$, then mn is equal to

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

13. If $ab = \frac{1}{2}$, then $(a-b)^2$ is equal to

- A. $a^2 - b^2$
- B. $a^2 + b^2$
- C. $a^2 + 1 - b^2$
- D. $a^2 - 1 + b^2$

14. On factorization of $1 - 2a + a^2 - b^2$, we get

- A. $(1-a-b)(1-a+b)$
- B. $(1-a-b)(1+a+b)$
- C. $(1+a-b)(1+a+b)$
- D. $(1+a-b)(1-a+b)$

15. The polynomial $x^3 - 2x^2 + 1$ is divisible by

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

16. The zero of a polynomial $3x + \frac{1}{3}$ is

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

17. If y varies directly as $\sqrt{x-3}$ and $y = 18$ for $x = 7$, then constant of proportionality is equal to

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

18. The mean proportional is equal to the

- A. square of the product of means.
- B. square of the product of extremes.
- C. square root of the product of means.
- D. square root of the product of extremes.

19. Which of the following matrices are square matrices?

- I. $\begin{bmatrix} 1 \end{bmatrix}$
- II. $\begin{bmatrix} 1 & a \end{bmatrix}$
- III. $\begin{bmatrix} a-7 & 2 \\ 0 & 0 \end{bmatrix}$

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

20. If the determinant of the matrix $\begin{bmatrix} -1 & 1 \\ -7 & 5 \end{bmatrix}$ is 2, then the determinant of its additive inverse is

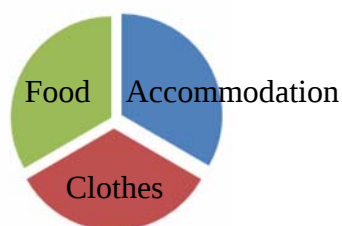
- A. -2
- B. 2
- C. $\frac{1}{2}$
- D. $-\frac{1}{2}$

21. If $\begin{bmatrix} 3 & K \\ 1 & 0 \end{bmatrix}$ is a non-singular matrix, then

- A. $K \neq 0$
- B. $K \neq 1$
- C. $K \neq 3$
- D. $K \neq -3$

22. In the given pie chart if all the three sections are cut equally, then the angle of each section is

- A. 60°
- B. 90°
- C. 120°
- D. 360°



23. If $Y = \frac{a}{2}X + b$, $\bar{X} = 2$ and a and b are constants, then $\bar{Y}$ is equal to

[Note: $\bar{X}$ and $\bar{Y}$ are the arithmetic means of X and Y respectively]

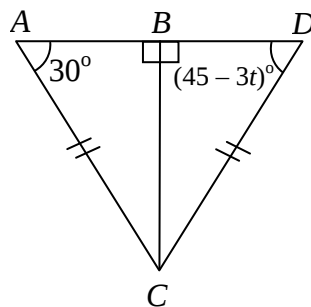
- A. $\frac{a}{2} + b$
- B. $a + b$
- C. $\frac{a+b}{2}$
- D. $a + \frac{b}{2}$

24. In order to find the mode of the data we need to identify the

- A. minimum value.
- B. maximum value.
- C. least repeated value.
- D. most repeated value.

25. If $\triangle ABC \cong \triangle DBC$, then the value of t is equal to

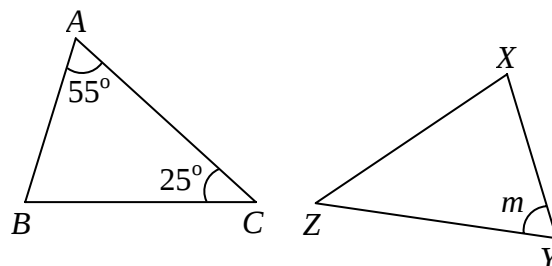
- A. 5
- B. 12
- C. 18
- D. 25



NOT TO SCALE

26. In correspondence $\triangle ABC \longleftrightarrow \triangle XYZ$, if two triangles are congruent, then the value of m is equal to

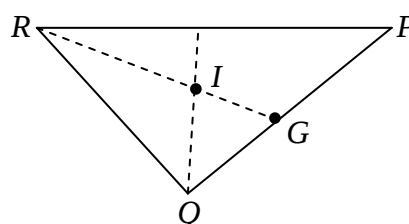
- A. 25°
- B. 55°
- C. 80°
- D. 100°



NOT TO SCALE

27. If I is the point of concurrency of medians of the triangle PQR , then which of the following conditions must be true?

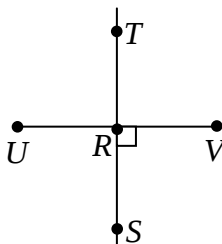
- A. $RI = IG$
- B. $IG = 3RI$
- C. $IG = \frac{1}{2}RI$
- D. $IG = 2RI$



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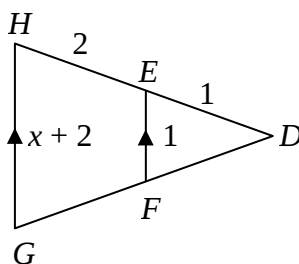
28. In the given diagram if TS is the right bisector of $\overline{UV}$, then which of the following conditions is TRUE?

- A. $TU = TV$
 B. $TU = RV$
 C. $US = RT$
 D. $TS = UV$



29. In the given diagram the value of x is equal to

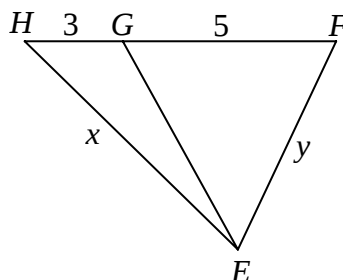
- A. 1
 B. 2
 C. 3
 D. 4



NOT TO SCALE

30. If EG is the angle bisector of $\angle FEH$, then which of the following conditions is TRUE?

- A. $\frac{x}{y} = \frac{3}{5}$
 B. $\frac{x}{5} = \frac{y}{3}$
 C. $\frac{x}{y} = \frac{8}{3}$
 D. $\frac{x}{y} = \frac{3}{8}$



NOT TO SCALE

Please use this page for rough work