AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

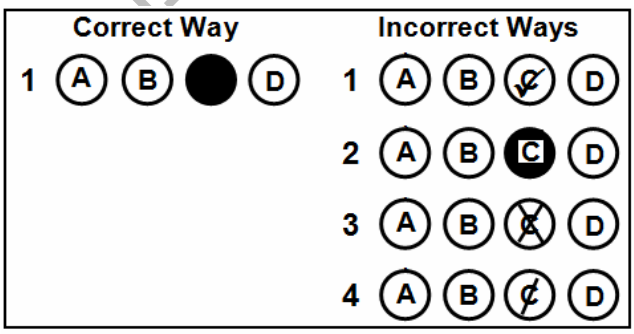
MAY 2016

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.



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 is a rational number?

   A. $\sqrt{2}$
   B. π
   C. 3.33333…
   D. 3.2137814115…

2. $\dfrac{a}{a^3 \times a^{-2}}$ is equal to

   A. 0
   B. 1
   C. a^2
   D. $\dfrac{1}{a}$

3. $\left(a^{\,2}\right)^{-3}$ is equal to

   A. $-a^{-6}$
   B. a^{-1}
   C. a^{-6}
   D. a^{-8}

4. If $a + 2i = b + 2i$, then

   A. $a - b = 0$
   B. $a + b = 0$
   C. $a + b = 2$
   D. $a - b = 2$

5. Given that $A = \{a\}$ and $B = \{1, 2\}$, then $B - A$ is equal to

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

6. Given that $A = \{a, b\}$, $B = \{1, 2\}$ and $C = \{2, 3\}$, then $(A \cap B) \cup C$

   A. { }
   B. $\{a, b\}$
   C. $\{2, 3\}$
   D. $\{a, b, 1, 2, 3\}$

7. Which of the following options represents the distributive property of intersection over union for three non-empty sets *A*, *B* and *C* ?

A. $(A \cap B) \cup C = (A \cap B) \cup (A \cap C)$
B. $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
C. $(A \cap B) \cup C = (A \cap C) \cup (B \cap C)$
D. $A \cap (B \cup C) = (A \cup B) \cap (A \cup C)$

8. If $A = \{a, b\}$ and $B = \{2, 3\}$, then one of the relation from *A* to *B* is

A. $\{(a, b), (2, 3)\}$
B. $\{(a, 3), (2, b)\}$
C. $\{(a, 2), (a, 3)\}$
D. $\{(2, a), (3, b)\}$

9. 0.00717 is equal to

A. 71.7×10^{-3}
B. 7.17×10^{-3}
C. 7.17×10^{-2}
D. 71.7×10^{-2}

10. The logarithmic form of $a^{-3} = x$ is

A. $\log_{-3} a = x$
B. $\log_x a = -3$
C. $\log_a x = -3$
D. $-\log_3 a = x$

11. In simplified form, $\frac{(x-1)^2}{x^2-1}$ is equal to

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

12. If $a = 1$ and $b = -1$, then the value of $\frac{a^2 - b^2}{a^2 + b^2}$ is equal to

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

13. Given that $(a-b)^2 = 16$ and $a^2 + b^2 = 26$ then ab is equal to

A. -10
B. -5
C. 5
D. 10

14. On complete factorisation of $-(\frac{2}{x}) - (\frac{4}{x^2})$, we get

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

15. On complete factorisation of $-by^2 + b^3$, we get

A. $-b(y^2 + b^2)$
B. $-b(y^2 - b^3)$
C. $-b(y-b)(y-b)$
D. $-b(y-b)(y+b)$

16. On complete factorisation of $c^2 - c - 2$, we get

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

17. If x, y and z are in continued proportion, then which of the following options is CORRECT?

A. $x = yz$
B. $z = xy$
C. $y^2 = xz$
D. $x^2 = yz$

18. 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

19. The transpose of the matrix $\begin{bmatrix} a & -c \\ -d & b \end{bmatrix}$ is

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

20. $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix} \times \begin{bmatrix} 1 \\ -1 \end{bmatrix}$ is

A. not possible.
B. $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$.
C. $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$.
D. $\begin{bmatrix} 1 & -1 \\ 1 & -1 \end{bmatrix}$.

21. The determinant of the matrix $\begin{bmatrix} -2 & 0 \\ -5 & 10 \end{bmatrix}$ is

A. -25
B. -20
C. -15
D. 15

22. Which of the following statistical measurements may have more than one value for a set of data?

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

23. The median of the data 18, 3, 17, 1, 18, 5, 2 is

A. 5
B. 17
C. 17.5
D. 18

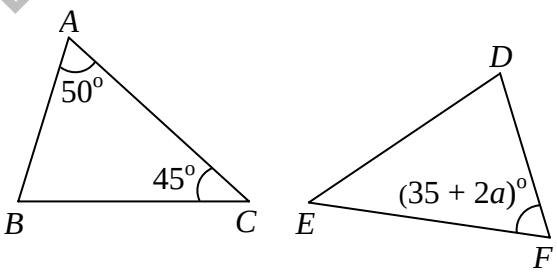
24. The mean of 10 numbers is 13. If 5 is subtracted from every number, then the new mean will become

A. 5
B. 6.5
C. 8
D. 12.5

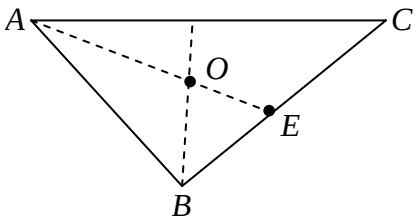
25. If $\Delta ABC \cong \Delta DFE$, then the value of a is equal to

A. 20^o
B. 25^o
C. 35^o
D. 50^o

NOT TO SCALE



26. If O is the point of concurrency of medians of the triangle ABC and $m\overline{OE} = 5\text{cm}$, then $m\overline{AO}$ is



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A. 2.5 cm
B. 5 cm
C. 10 cm
D. 15 cm

27. In the given diagram, $m\overline{BC}$ is equal to

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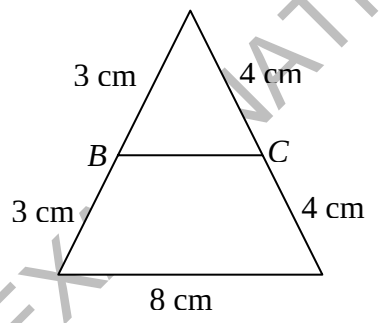
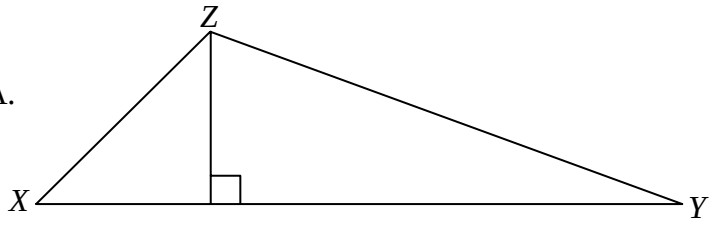
A. 3 cm
B. 4 cm
C. 5 cm
D. 6 cm

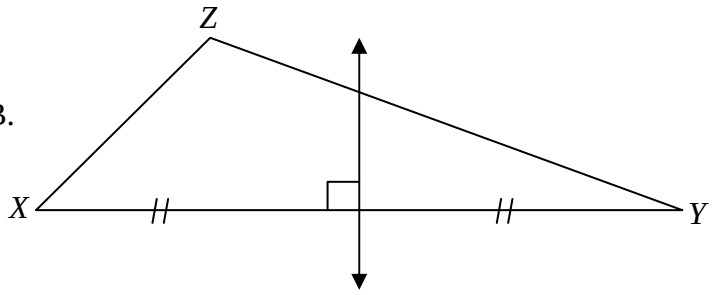


28. Which of the following diagrams represents a right bisector of the side *XY* of the triangle *XYZ?*

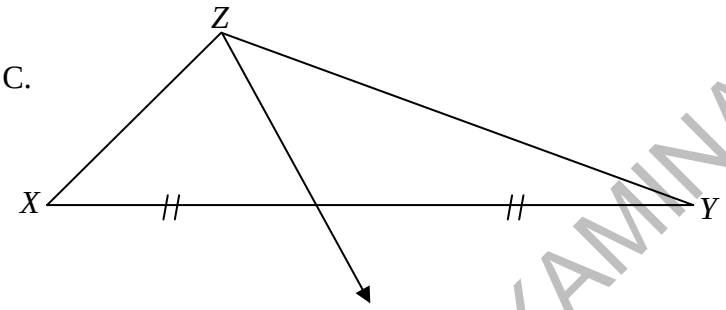
A.



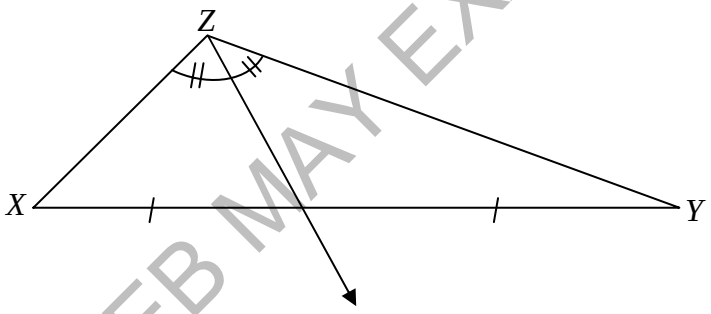
B.



C.

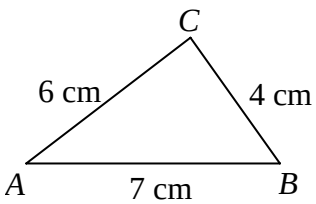


D.



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. $m\angle C > m\angle B$



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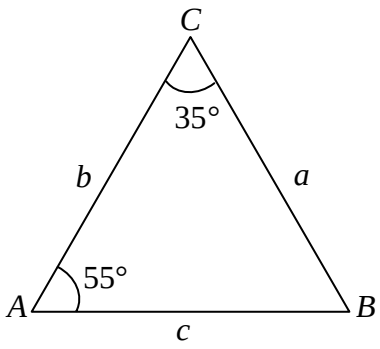
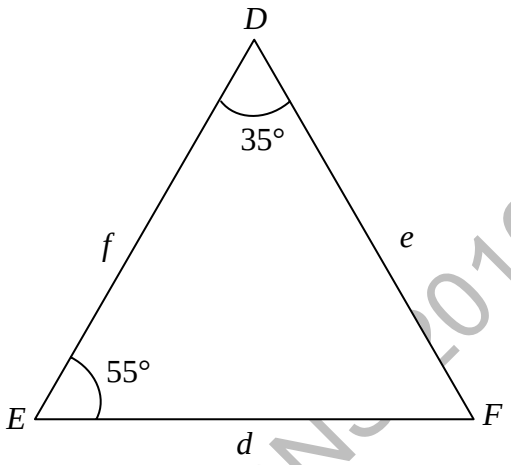
30. For the given ΔABC and ΔDEF, which of the following options is TRUE?





A. $\frac{a}{e} = \frac{f}{b}$

B. $af = be$

C. $a + b = e + f$

D. $b - a = f - e$

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