AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

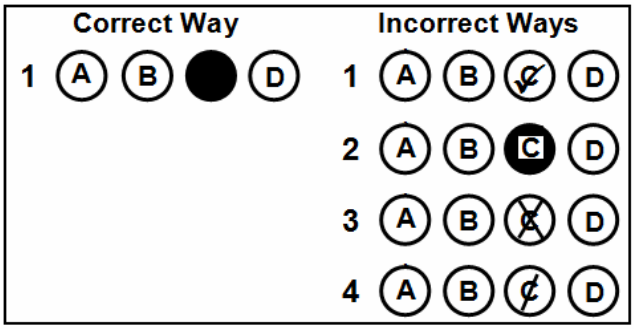
MAY 2012

Mathematics Paper I

Time allowed: 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. If $a + b = 0 = b + a$, then b is called

   A. additive inverse of a.
   B. multiplicative inverse of a.
   C. additive identity.
   D. multiplicative identity.

2. In the following numbers the irrational number is

   A. $\frac{3}{2}$
   B. $\sqrt{\frac{3}{2}}$
   C. $\sqrt{\frac{16}{9}}$
   D. 3.125

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

   A. 0
   B. 1
   C. $9^{-\frac{1}{4}}$
   D. $3^{-\frac{1}{4}}$

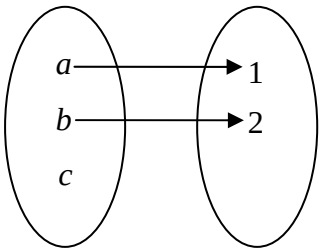
4. $(3 + 2i) \times i$ is equal to

   A. $-2 + 3i$
   B. $3 - 2i$
   C. $2 - 3i$
   D. $-3 + 2i$

5. If $A = \{a , b\}$ and $B = \{c , d\}$, then $A - B$ is equal to

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

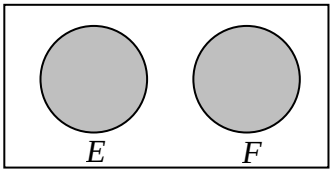
6. The given diagram represents



I. a one – one function.
II. a one – one correspondence.
III. an onto function.

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

7. In the given Venn diagram the shaded portion represents



A. $E \cap F$
B. $E \cup F$
C. $E^C \cup F^C$
D. $E^C \cap F^C$

8. If $A = \{a , b\}$ and $B = \{2 , 3\}$, then one 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. The characteristic of log 0.001 is

A. 3
B. 2
C. – 2
D. – 3

10. $\dfrac{2a^4}{3(b + 1)^2} \times 6(b + 1)^2$ is equal to

A. $2a^4$
B. $4a^4$
C. $4a^2(b + 1)^2$
D. $2a^4(b + 1)^2$

11. If $(a + b)^2 = 16$ and $4ab = 12$, then $(a - b)^2$ is equal to

A. 4
B. 8
C. ± 4
D. ± 8

12. $(x + y)^3$ is equal to

A. $x^3 + y^3$
B. $x^3 + y^3 - 3xy(x + y)$
C. $x^3 + y^3 + 3xy(x - y)$
D. $x^3 + y^3 + 3xy(x + y)$

13. On factorization of $2x + 2y - (x + y)$, we get

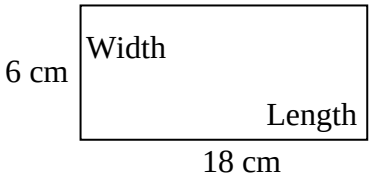
A. $-(x + y)$
B. $-(x - y)$
C. $(x + y)$
D. $(x - y)$

14. On factorization of $4b^2 - 1$, we get

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

15. The length and width of a rectangle are shown in the figure. The ratio of width to length is

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



16. For $4 : b :: b : 25$, the mean proportion b is equal to

A. $\pm \frac{5}{2}$
B. $\frac{5}{2}$
C. 10
D. ± 10

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. Order of matrix $A = \begin{bmatrix} 2 & 1 & 3-a \\ 0 & 0 & 3-b \end{bmatrix}$ is

A. 2×3
B. 3×2
C. 2×4
D. 4×2

19. $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$ is a

A. diagonal matrix.
B. rectangular matrix.
C. scalar matrix.
D. unit matrix.

20. If $A = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \end{bmatrix}$, then AB is

A. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
B. $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$
C. $\begin{bmatrix} 1 & 0 \end{bmatrix}$
D. $\begin{bmatrix} 0 & 1 \end{bmatrix}$

21. The following table shows the number of ice-creams sold in a certain week of May at a shop.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
110	120	110	130	80	200	220

The median of the given table is

A. 110
B. 120
C. 130
D. 220

22. Sana draws 10 cards from a bag. The cards are numbered from 0 to 4.
The data are recorded as follows:

Score	Number of Cards
0	4
1	1
2	2
3	1
4	2

The average score of 10 cards is

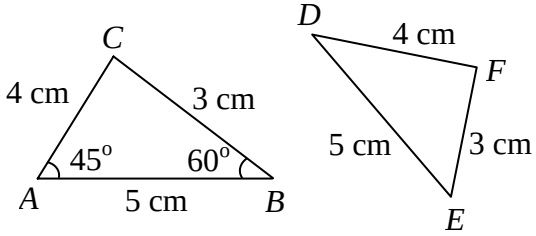
A. 1
B. 2
C. 1.6
D. 2.7

23. Which of the following graphical methods is the most appropriate to estimate mode?

A. Histogram
B. Frequency polygon
C. Pie chart
D. Cumulative frequency polygon

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

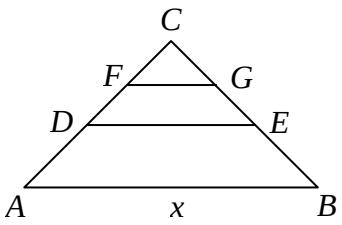
A. 45°
B. 60°
C. 65°
D. 75°



NOT TO SCALE

25. If *D*, *E*, *F* and *G* are the mid points of *AC*, *BC*, *DC* and *EC* respectively, then *m FG* is equal to

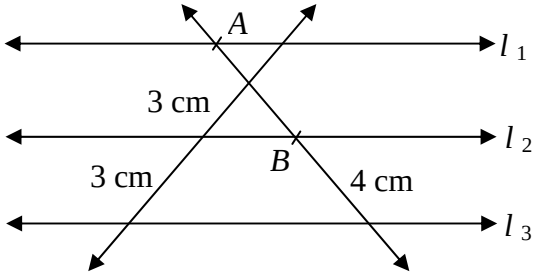
A. $4x$
B. $2x$
C. $\frac{x}{2}$
D. $\frac{x}{4}$



NOT TO SCALE

26. If l_1 , l_2 and l_3 are three parallel lines, then in the given figure $m\,AB$ is equal to

A. 7 cm
B. 4 cm
C. 3 cm
D. 2 cm

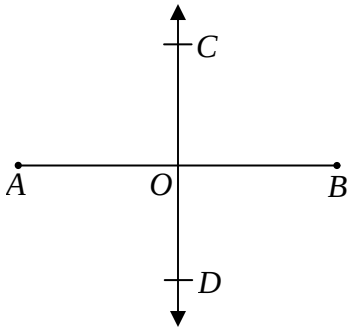


NOT TO SCALE

27. In the given figure if *CD* is the right bisector of line segment *AB*, then which of the following conditions is/are TRUE?

I. $AB \perp CD$
II. $AO \cong OB$
III. $AC \cong AO$

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



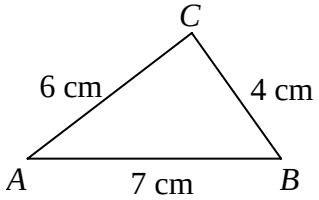
NOT TO SCALE

28. The point of concurrency of angle bisectors of a triangle is called

A. centroid.
B. circum centre.
C. inscribed centre.
D. circum circle.

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

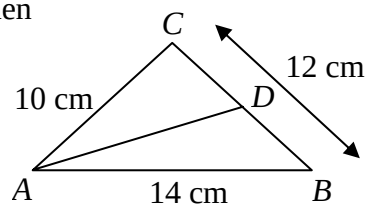
A. $m\angle A > m\angle B$
B. $m\angle B > m\angle C$
C. $m\angle A > m\angle C$
D. $m\angle C > m\angle B$



NOT TO SCALE

30. If *AD* is the angle bisector of ΔBAC , then

A. $CD : BD = 5 : 7$
B. $CD : BD = 7 : 5$
C. $CD : BD = 5 : 6$
D. $CD : BD = 7 : 6$



NOT TO SCALE

END OF PAPER

Please use this page for rough work