AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X EXAMINATION

APRIL/ MAY 2018

General Mathematics Paper II

Time: 2 hours 20 minutes Marks: 45

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

I agree that this is my name and school. **Candidate's signature**

2. RUBRIC. There are TEN questions. Answer ALL Questions. Choices are specified inside the paper.

3. When answering the questions:

   Read each question carefully.
   Use a black pointer to write your answers. DO NOT write your answers in pencil.
   Use a black pencil for diagrams. DO NOT use coloured pencils.
   DO NOT use staples, paper clips, glue or correcting fluid.
   Complete your answer in the allocated space only. DO NOT write outside the answer box.

4. The marks for the questions are shown in brackets ( ).

5. You may use a simple calculator if you wish.

(ATTEMPT EITHER PART a OR PART b OF Q.1.)

Q.1. (Total 5 Marks)

a. Simplify the following expression into the lowest term.

$$\frac{a^2x^2 + 2abx + b^2}{(ax)^2 - b^2} \div \frac{ax + b}{ax - b}$$

b. Without using calculator, if $x = \frac{1}{7 - \sqrt{48}}$, then find the value of $x + \frac{1}{x}$

(ATTEMPT EITHER PART a OR PART b OF Q.2.)

Q.2. (Total 5 Marks)

a. The algebraic expression $x^3 + 3x^2 + ax - b$ is divided by $x - 1$ and $x + 2$. The remainders are 3 and -12 respectively. Find the value of a. (5 Marks)

b. Factorise the following expressions completely.

i. $ax + 2y + 2x + ay$ (3 Marks)

ii. $x^2 + 2bx + b^2 - y^2$ (2 Marks)

(ATTEMPT EITHER PART a OR PART b OF Q.3.)

Q.3. (Total 4 Marks)

a. Simplify the fractional expression $\frac{3}{x-3}-\frac{2}{x-2}-\frac{1}{x}$ completely.

b. Find the square root of $x^4+4x^3-2x^2-12x+9$.

Q.4. (Total 5 Marks)

a. Find the value of x for the equation $2x + \frac{x}{3} = -7$. (3 Marks)

b. Find the value(s) of x for the equation $|x - 18| = 18$. (2 Marks)

(ATTEMPT EITHER PART a OR PART b OF Q.5.)

Q.5. (Total 5 Marks)

a. Find the solution set of the quadratic equation $(x-2)(3x-1)=2$.

b. The product of two consecutive positive odd integers is 1443. Find the smaller of the two integers.

(ATTEMPT EITHER PART a OR PART b OF Q.6.)

Q.6. (Total 5 Marks)

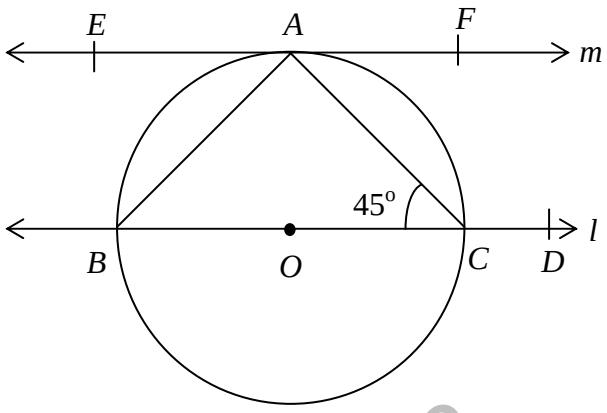
a. Find the matrix X from the following equation.

$$\frac{1}{3}X + \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \times \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix} = \begin{bmatrix} 10 & 8 \\ 6 & 4 \end{bmatrix} + \begin{bmatrix} 10 & 8 \\ 6 & 4 \end{bmatrix}$$

b. For the matrices $A = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 2 \\ 6 & 4 \end{bmatrix}$, find $A \times B^{-1}$.

Q.7. (Total 5 Marks)

The given diagram shows a circle having centre *O*. *l* and *m* are two lines parallel to each other and *m* is tangent to the circle.



NOT TO SCALE

Find the measurements of the following angles.

i. $\angle BAC$ (1 Mark)

ii. $\angle ABC$ (1 Mark)

iii. $\angle ACD$ (1 Mark)

iv. $\angle BAE$ (1 Mark)

v. $\angle BAF$ (1 Mark)

Q.8. (Total 4 Marks)

Draw a triangle whose sides are of measurements 9 cm, 6 cm and 7 cm. Also construct any two of its altitudes.

Space for diagram

Q.9. (Total 4 Marks)

Find the area of a square that has a diagonal of length 10 cm.

Q.10. (Total 3 Marks)

Prove that the points A (0, 0), B (3, 4) and C (6, 8) are collinear points.

END OF PAPER

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