

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

APRIL/ MAY 2018

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 ELEVEN 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, correcting fluid or ink erasers.
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 4 Marks)

a. Simplify the following and express it in the lowest exponential form.

i. $\frac{a^2b^3}{(ab^3)^5}$ (2 Marks)

ii. $a^0 \times a^{\frac{3}{4}} \times a$ (2 Marks)

b. Separate the real and imaginary parts of $\frac{(2-i)^2}{1+i}$. (4 Marks)

Q.3.

(Total 3 Marks)

Find the value of x for $\log_6 1 + \frac{\log_6 216}{\log_6 36} = x$.

AKU-EB May 2018
for
Teaching & Learning Only

(ATTEMPT EITHER PART a OR PART b OF Q.4.)

Q.4.

(Total 4 Marks)

- a. If $x + \frac{1}{x} = 5$, then find the value of $x^3 + \frac{1}{x^3}$.
- b. For three quantities a , b and c , if $a + b + c = 80$ and $a^2 + b^2 + c^2 = 3000$, then find the value of $ab + bc + ca$.

AKU-EB May 2018
for Teaching & Learning Only

PLEASE TURN OVER THE PAGE

AKU-EB May 2018
for
Teaching & Learning Only

Q.5. (Total 5 Marks)

- a. Two factors of the polynomial $p(x) = x^3 + mx^2 + nx - 2$ are $x - 1$ and $x + 1$. Find the values of m and n . (5 Marks)
- b. Factorise the following completely.
- i. $36a^4 + 12a^2b + b^2 - 9$ (3 Marks)
- ii. $a^{15} - 216b^{15}$ (2 Marks)

AKU-EB May 2018
for
Teaching & Learning Only

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

Q.6.

(Total 4 Marks)

- a. The width w units of a rectangular solid with a fixed volume, is inversely proportional to its length l units and breadth b units.

Width (w units)	Length (l units)	Breadth (b units)
3	4	2
?	6	2.5

Using the table, find the missing width of the rectangular solid.

- b. If $\frac{a}{b} = \frac{c}{d}$, then prove that $\frac{5a+3c}{5b+3d} = \sqrt[5]{\frac{a^5}{b^5}}$ using K-method.

AKU-EB May 2019
for
Teaching & Learning C

PLEASE TURN OVER THE PAGE

Q.7. (Total 5 Marks)

a. Find the value of p and q for the given matrix equation.

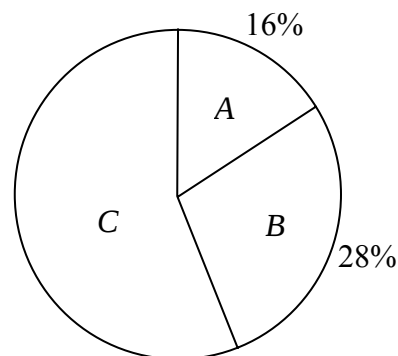
$$2 \begin{bmatrix} 2 & p \\ 1 & 5 \end{bmatrix} + \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix} = \begin{bmatrix} 5 & 2 \\ q & 10 \end{bmatrix} \quad (3 \text{ Marks})$$

b. Given that $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 1 \end{bmatrix} \times \begin{bmatrix} 0 & 2 \\ 1 & 3 \\ 5 & 1 \end{bmatrix}$. State the reason why these two matrices are conformable for multiplication. (2 Marks)

Q.8.

(Total 4 Marks)

In a survey, employees of a company were asked their preferred lunch menu from choices A, B and C. The results are represented in the given pie chart containing three sections.



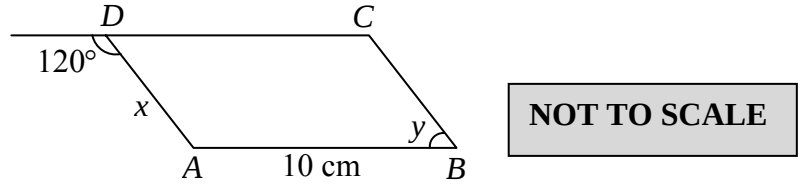
Use the given information to complete the given table.

Menu	Percentage of Employee	Number of Employee	Angle of Section
A	16%	64	
B	28%		
C			

PLEASE TURN OVER THE PAGE

Q.9. (Total 4 Marks)

The perimeter of the given parallelogram $ABCD$ is 38 cm. Find x and y .

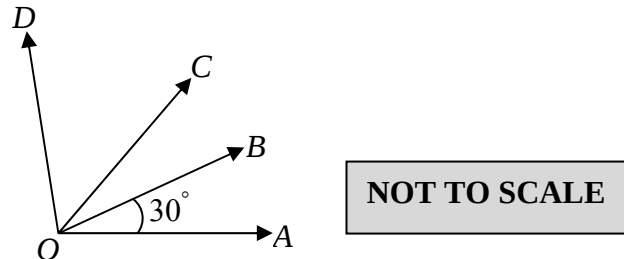


(ATTEMPT EITHER PART a OR PART b OF Q.10.)

Q.10.

(Total 4 Marks)

- a. In the following figure, OB and OC are angle bisectors of $\angle COA$ and $\angle DOA$ respectively.



Find

i. $\angle DOC$

(2 Marks)

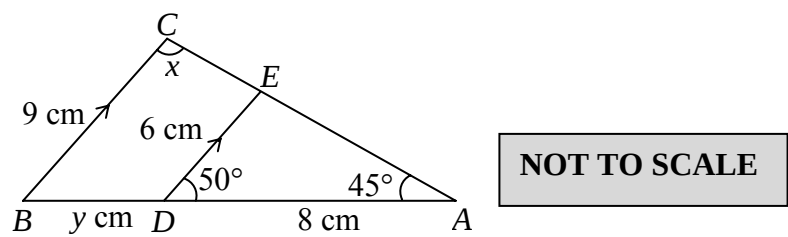
ii. $\angle DOA$

(2 Marks)

PLEASE TURN OVER THE PAGE

(ATTEMPT EITHER PART a OR PART b OF Q.10.)

- b.
- In the following diagram, BC is parallel to DE . Find the values of x and y .
- (4 Marks)



Q.11.

(Total 4 Marks)

Construct a triangle ABC with $AB = 10$ cm, $\angle A = 30^\circ$ and $BC = 6$ cm. Also draw two medians of the triangle.

Space for diagram

AKU-EB May 2018
for
Teaching & Learning Only

END OF PAPER

Please use this page for rough work

AKU-EB May 2018
for
Teaching & Learning Only

Please use this page for rough work

AKU-EB May 2018
for
Teaching & Learning Only

Please use this page for rough work

AKU-EB May 2018
for
Teaching & Learning Only