AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX 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 colour 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.

Q.1. (Total 3 Marks)

For a gathering of 8 people, a chef makes 12 vegetable rolls in 30 minutes.

a. He plans to make 20 rolls for the same number of people at the next party. If he works at the same rate, how long will it take him to make the rolls? (2 Marks)

b. If 6 of these rolls are sold for Rs 120, then what will be the cost of 3 dozen rolls? (1 Mark)

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

Q.2. (Total 4 Marks)

a. Rashida owns gold of mass 95 grams for the past one year. The rate of gold is Rs 38,000 per 10 grams. She also has annual savings of Rs 30,500. What is the total amount of Zakat she should pay?

(**Note:** Rate of Zakat is 2.5% of annual savings.)

b. Sajid wants to divide his property and savings among his 4 daughters and 3 sons. He owned a house which he sold for Rs 4,000,000 and he has savings of Rs 930,000. Find the share of each son and daughter.

(**Note:** The son gets two times as much as a daughter gets.)

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

Q.3. (Total 5 Marks)

a. A cafeteria offers two family meals: meal *A* and *B*. The price of family meal *A* and *B* is Rs 1,500 and Rs 1,100 respectively. The cafeteria offers following discounts during holidays.

DISCOUNT OFFER 1:	BUY MEAL *A* OR *B*, GET 12% OFF
DISCOUNT OFFER 2:	BUY MEAL *A* AND *B* FOR Rs 1,950

A family visits this cafeteria during holidays and buys 2 meals *A* and 1 meal *B*. If they avail both discount offers, what is the amount of money they save? (5 Marks)

b. A man bought two motorbikes for Rs 70,000 each. He sells one of these bikes at a loss of 20% and the other bike at a profit of 25%.

Find the

i. selling price of each bike. (3 Marks)

ii. total profit or loss he made from selling the two bikes. (1 Mark)

iii. percentage profit or loss he made from selling the two bikes. (1 Mark)

Q.4. (Total 3 Marks)

Samar leased a car worth Rs 1,547,000 with a down payment of 50%. If the rate of simple interest on the remaining amount is 7% per annum for a period of 2 years, find the

a. total interest Samar pays in 2 years. (2 Marks)

b. total cost of the car. (1 Mark)

Q.5. (Total 5 Marks)

Rubab, Zahra and Naveed work for a software development company.

Rubab works on contract according to which she is required to complete 23 hour working week. She is paid at an hourly rate of Rs 2,000.

Zahra works on contract according to which she is required to complete 38 hour working week. She is paid at an hourly rate of Rs 1,100.

Naveed's annual salary is Rs 1,060,000.

Assuming that there are exactly 4 weeks in a month, find the monthly income of each person and state which person has the highest monthly income?

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

Q.6. (Total 5 Marks)

a. Find the value of x for the following logarithmic equations.

i. $\log_5(x+3) = 2$ (2 Marks)

ii. $\dfrac{\log_6 216}{\log_6 36} = x$ (3 Marks)

b. Express the following expressions in their simplest form in terms of x.

i. $\dfrac{\sqrt[3]{x^4}}{x}$ (2 Marks)

ii. $x\sqrt{81x^4}$ (3 Marks)

Q.7. (Total 4 Marks)

An office building has 5 floors. It accommodates 143 employees on the first floor, 118 employees on the second floor and 93 employees on the third floor. If the number of employees on each floor follows an arithmetic sequence, find the number of employees that can be accommodated on the 4^{th} and 5^{th} floor of the building.

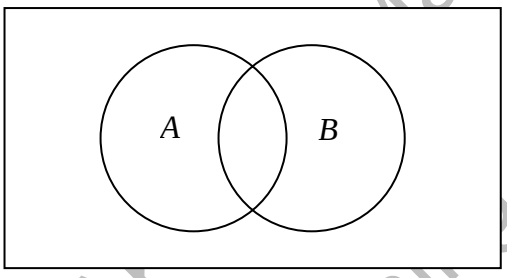
(ATTEMPT EITHER PART a OR PART b OF Q.8.)

Q.8. (Total 5 Marks)

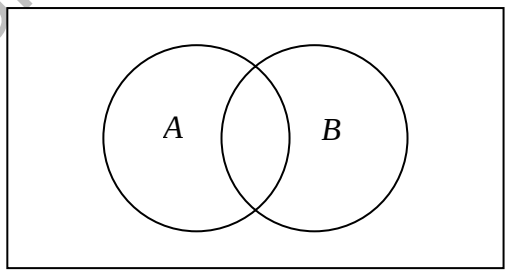
a. For sets $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{2, 4, 6, 8, 10\}$, verify that $(A \cap B) - A = (A \cap B) - B$. Also find $(A \cup B) - A$.

b. If A and B are any two non-empty and mutually overlapping sets, then represent the following by shading the given Venn diagrams.

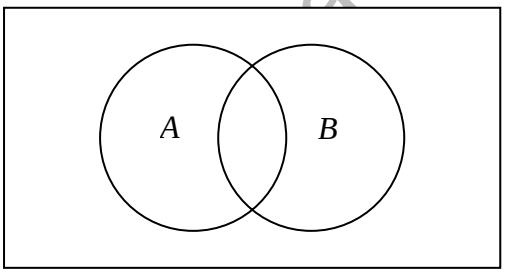
i. $A \cup B$



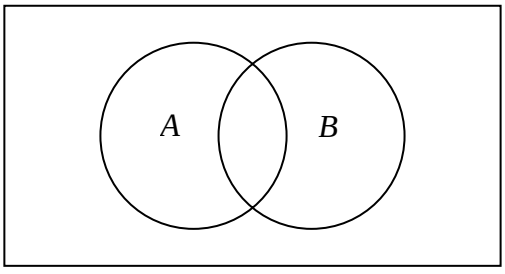
ii. $A \cap B$



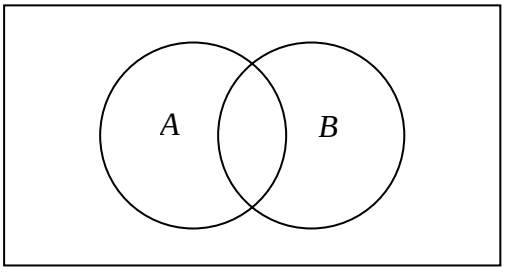
iii. $B - A$



iv. $A - B$



v. A^c



Q.9. (Total 5 Marks)

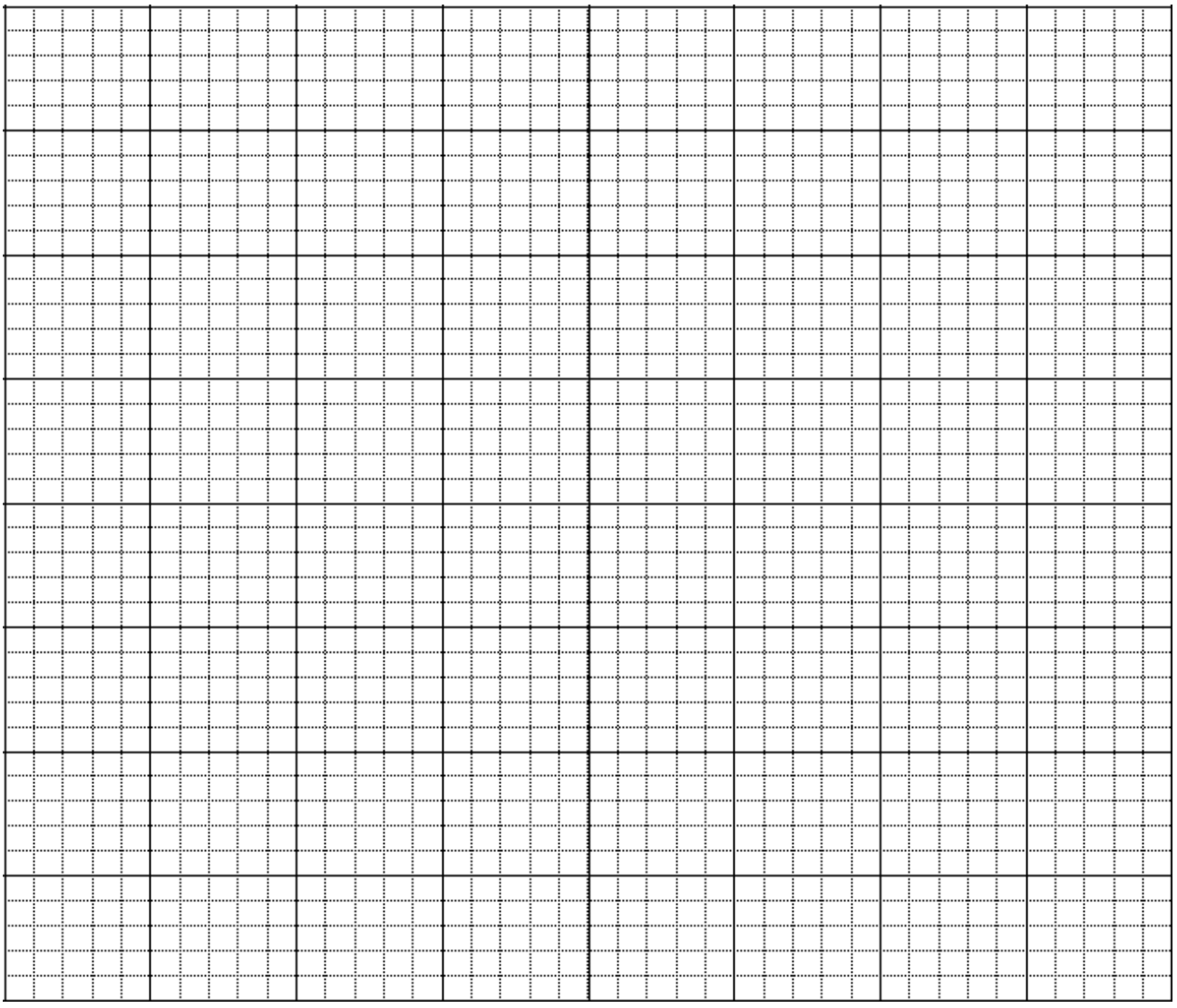
In the given graph, draw the following lines.

a. $y = 2$ (1 Mark)

b. $y = 2x$ (2 Marks)

c. $y = 2x + 2$ (2 Marks)

(**Note:** For part b and c, find two points only for plotting each line.)



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

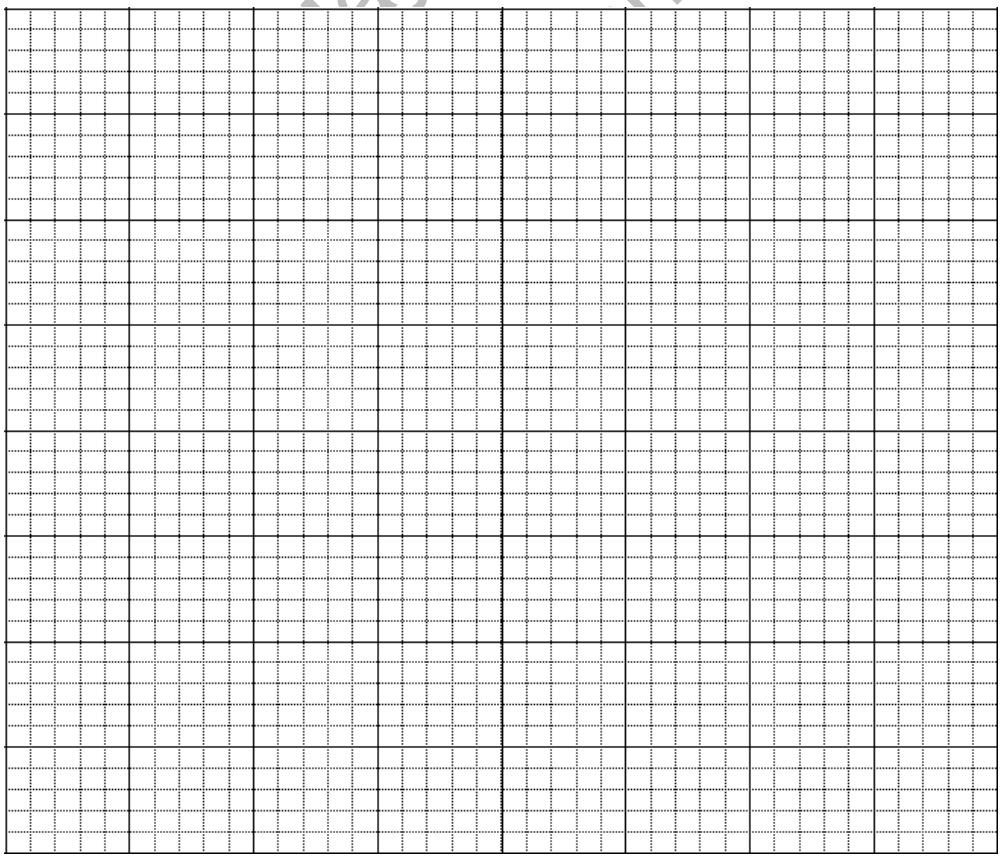
Q.10. (Total 6 Marks)

a. The given table shows the length (in centimetres) of 28 leaves.

i. Find the class boundaries in the given table. (1 Mark)

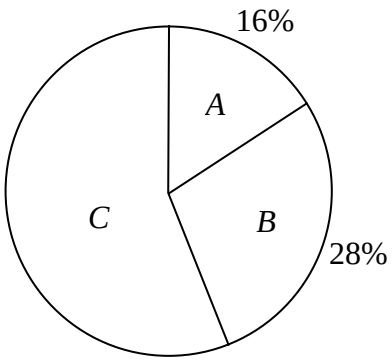
Length (cm)	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25
Class Boundary					
Frequency	2	5	10	8	3
Cumulative Frequency	2	7	17	25	28

ii. After completing the table in part i, draw cumulative frequency curve of the given data and estimate the median graphically. (5 Marks)



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

b. In a survey, 400 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. (6 Marks)



NOT TO SCALE

Use the given information to complete the given table.

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

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