AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XI EXAMINATION

APRIL/ MAY 2019

Business Mathematics Paper II

Time: 1 hour 30 minutes Marks: 30

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**

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2. There are SIX 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 scientific calculator if you wish.

Q.1. (Total 5 Marks)

a. Ms Zubaida paid Rs 4,750 for a suit after a discount of 15% followed by a sales tax of 10% of the actual price. Find the actual price of the suit. (3 Marks)

b. It is given that $a:b=3:1$.

i. Express a in terms of b. (1 Mark)

ii. Hence, evaluate $\frac{a+b}{b}$. (1 Mark)

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

Q.2. (Total 5 Marks)

a.

i. Amina deposited Rs 50,000 in a saving scheme on annual simple interest basis. After 30 months, the amount deposited becomes Rs 57,500. Find the rate of simple interest. (3 Marks)

ii. What will be the amount of interest Amina gets after 6 years at the same rate as in part (i)? (2 Marks)

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

b. For a certain amount x, the compound interest compounded annually is Rs 100 more than the simple interest. The rate of simple and compound interest for 4 years is 6% per annum.

i. Find an expression, in terms of x, for

I. simple interest. (1 Mark)

II. compound interest. (2 Marks)

ii. Hence, find x. (2 Marks)

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

Q.3. (Total 5 Marks)

a. It is given that x and y are binary numbers, where $x = 1011$ and $y = 1101$.

i. Without using a calculator, show that the value of $(x + y)$ in base 10 is 24. (3 Marks)

ii. Hence, find $(x + y)_5 - 14_5$ (2 Marks)

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

b. Without using a calculator, express the sum of $(56)_{10}$ and $(101)_8$ in a binary number system.

(5 Marks)

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

Q.4. (Total 5 Marks)

a. The equation of straight line is given as $\frac{x-1}{a}+\frac{y}{2}=10$.

i. Reduce this equation in slope – intercept form, i.e. $y=mx+c$. (2 Marks)

ii. Hence, find the slope if y – intercept is 18. (3 Marks)

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

b. The equation of parabola is given by $y = mx^2 + nx + r$.

i. State the value of r if this equation passes through $(0, 15)$. (1 Mark)

ii. Given that the x – coordinates of vertex of parabola is $\frac{5}{2}$, show that $n = -5m$. (2 Marks)

iii. If $n + m = 8$, then find the value of m. Hence, state the concavity of the given equation. (2 Marks)

Q.5. (Total 5 Marks)

Akber subtracts 5 from the numerator and denominator of a fraction that results in $\frac{7}{2}$. This result is decreased by 1 when he adds -1 to numerator and denominator of the original fraction.

(**Note**: Let *x* be the numerator and *y* be the denominator)

a. Find two equations which satisfy the above conditions. (4 Marks)

b. Hence, find the denominator. (1 Mark)

Q.6. (Total 5 Marks)

Let $X = \begin{bmatrix} a & b & c \end{bmatrix}$, $Y = \begin{bmatrix} 3 & 4 \end{bmatrix}$ and $Z = \begin{bmatrix} 1 & 5 & 3 \\ 2 & 6 & 4 \end{bmatrix}$

The matrices X, Y and Z are given in such a way that $YZ = XI$, where I is an identity matrix.

a. State the order of I with a valid reason. (2 Marks)

b. Find the values of a, b and c. (3 Marks)

END OF PAPER

Please use this page for rough work

Please use this page for rough work