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STUDENT NAME: …….
MATHEMATICS EXAMINATION FOR S6 LFK
Duration: 3hrs *Total marks:* *..... /100*

SECTION A **:ATTEMPT ALL QUESTIOS** **/55marks**

Choose the correct answer

1. The mean of the data set X = {2, 4, 6, 8} is: /4marks
   a. 4
   b. 5
   c. 6
   d. 7
2. Covariance between X and Y shows: /4marks
   a. Strength of relationship only
   b. Direction of relationship only
   c. Both strength and direction
   d. Neither strength nor direction
3. Which of the following is ALWAYS true? /4marks
   a. $-2 \leq r \leq 2$
   b. $0 \leq r \leq 1$
   c. $-1 \leq r \leq 1$
   d. $-1 \leq r \leq 0$
4. If you toss 3 coins, the total number of outcomes is: /4marks
   a. 2
   b. 3
   c. 6
   d. 8
5. If X increases as Y decreases, the correlation is: /4marks
   a. Zero
   b. Positive
   c. Negative
   d. Undefined
6. The regression equation of Y on X is generally of the form: /5marks
   a. $Y = bX + a$
   b. $Y = aX^2 + b$
   c. $Y = XY + a$
   d. $X = bY + a$
7. In regression, the slope represents: /5marks

a. The average of X
b. Change in Y for a unit change in X
c. Total change in Y.
d. Total variation

8. Choose the solutions set of the following quadratic equations $3x^2 - x - 24 = 0$ /5marks

a. (-3,8)
b. $(\frac{8}{3}, 3)$
c. $(3, -\frac{8}{3})$

9. Spearman's rank correlation is used when: /5marks
   a. Data is normally distributed
   b. Data is ranked
   c. Data is nominal
   d. Data has more than two variables
10. The number of ways to choose 2 students from 10 is: /5marks
   a. 20
   b. 40
   c. 90
   d. 45
11. How many ways can 3 books be arranged on a shelf? /5marks
   a. 3
   b. 6
   c. 9
   d. 27
12. If you toss 3 coins, the total number of outcomes is: /5marks
   a. 2
   b. 3
   c. 6
   d. 8

SECTION B: CHOOSE ONLY THREE QUESTIONS /45marks

13. A researcher recorded the following data of students' study hours (X) and their test scores (Y):

X (hours)	**2**	**3**	**4**	**5**	**6**
Y (score)	50	55	60	65	70

(a) Calculate the mean of X and the mean of Y. /3marks
(b) Compute the covariance between X and Y. /5marks
(c) State whether the relationship is positive or negative. /2marks
(d) Calculate the correlation coefficient. /5marks

14. Given the following data for variables X and Y:

X	**1**	**2**	**3**	**4**
Y	2	3	5	8

(a) Fit a linear regression line of Y on X. / 8marks
(b) Use the regression equation to estimate Y when X = 6. /5marks
(c) Interpret the meaning of the slope. /2marks

15. In a survey of 50 people about which Hotels they patronize among Hilltop, Serena, and Lemigo. We find that 15 people eat at Hilltop, 30 people eat at Serena, 19 people eat at Lemigo 8 people eat at Hilltop and Serena, 12 people eat at Hilltop and Lemigo,7 people eat at Serena and Lemigo. 5 people eat at Hilltop, Serena, and Lemigo.

a. What is the chance that a person selected at random eats only at Hilltop? /4marks
b. How many eat at Hilltop and Serena, but not at Lemigo? /3marks
c. How many people don't eat at any of these three hotels? /3marks
d. What is the probability that a person selected at random do not eat at any of the hotelsmentioned? / 5marks

16. A bag contains 4 cards numbered 2, 4, 6, 9. A second bag contains 3 cards numbered 2, 3, and 6. One card is drawn at random from each bag.

a. Draw a tree diagram for the experiment. /5marks
b. With the help of the tree diagram, calculate theprobability that the two numbers obtained:
    i. Have different values. /2marks
    ii. Are both even. /2marks
    iii. Are both prime. /2marks
    iv. Have a sum greater than 5. /2marks
    v. Have a product greater than 16. /2marks

GOOD LUCK!!!