

PROBABILITY TOPIC

KCSE QUICK REVISION

*Compilation of Possible Questions in Mathematics Likely to be examined in
KCSE.*

*A Special Analysis of Prediction Questions that may be Tested in KCSE from this
Topic in Form 3.*

MATHEMATICS

SERIES 1

For Marking Schemes

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PROBABILITY

1. The probabilities that a husband and wife will be alive 25 years from now are 0.7 and 0.9 respectively.
Find the probability that in 25 years time,
 - (a) Both will be alive
 - (b) Neither will be alive
 - (c) One will be alive
 - (d) At least one will be alive

2. A bag contains blue, green and red pens of the same type in the ratio 8:2:5 respectively. A pen is picked at random without replacement and its colour noted
 - (a) Determine the probability that the first pen picked is
 - (i) Blue
 - (ii) Either green or red
 - (b) Using a tree diagram, determine the probability that
 - (i) The first two pens picked are both green
 - (ii) Only one of the first two pens picked is red.

3. A science club is made up of boys and girls. The club has 3 officials. Using a tree diagram or otherwise find the probability that:
 - (a) The club officials are all boys
 - (b) Two of the officials are girls

4. Two baskets A and B each contain a mixture of oranges and limes, all of the same size. Basket A contains 26 oranges and 13 limes. Basket B contains 18 oranges and 15 limes. A child selected a basket at random and picked a fruit at a random from it.
 - (a) Illustrate this information by a probabilities tree diagram
 - (b) Find the probability that the fruit picked was an orange.

5. In form 1 class there are 22 girls and boys. The probability of a girl completing the secondary education course is $\frac{3}{4}$ whereas that of a boy is $\frac{2}{3}$

- (a) A student is picked at random from class. Find the possibility that,
- (i) The student picked is a boy and will complete the course
- (ii) The student picked will complete the course
- (b) Two students are picked at random. Find the possibility that they are a boy and a girl and that both will not complete the course.

6. Three representatives are to be selected randomly from a group of 7 girls and 8 boys. Calculate the probability of selecting two girls and one boy.

7. A poultry farmer vaccinated 540 of his 720 chickens against a disease. Two months later, 5% of the vaccinated and 80% of the unvaccinated chicken, contracted the disease. Calculate the probability that a chicken chosen random contacted the disease.

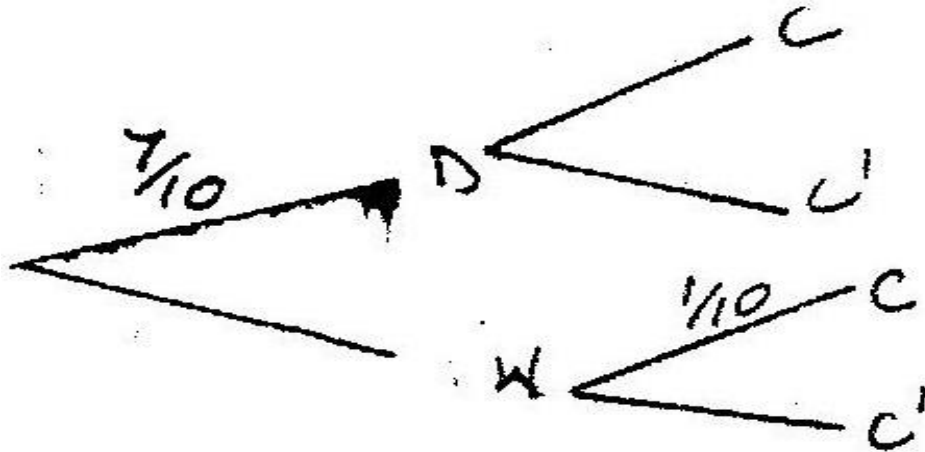
8. The probability of three darts players Akinyi, Kamau, and Juma hitting the bulls eye are 0.2, 0.3 and 1.5 respectively.

- (a) Draw a probability tree diagram to show the possible outcomes
- (b) Find the probability that:
- (i) All hit the bull's eye
- (ii) Only one of them hit the bull's eye
- (iii) At most one missed the bull's eye

9. (a) An unbiased coin with two faces, head (H) and tail (T), is tossed three times, list all the possible outcomes.

Hence determine the probability of getting:

- (i) At least two heads
- (ii) Only one tail
- (b) During a certain motor rally it is predicted that the weather will be either dry (D) or wet (W). The probability that the weather will be dry is estimated to be $\frac{7}{10}$. The probability for a driver to complete (C) the rally during the dry weather is estimated to be $\frac{5}{6}$. The probability for a driver to complete the rally during wet weather is estimated to be $\frac{1}{10}$. Complete the probability tree diagram given below.



What is the probability that:

- (i) The driver completes the rally?
- (ii) The weather was wet and the driver did not complete the rally?

10. There are three cars A, B and C in a race. A is twice as likely to win as B while B is twice as likely to win as C. Find the probability that.

- a) A wins the race
- b) Either B or C wins the race.

11. In the year 2003, the population of a certain district was 1.8 million. Thirty per cent of the population was in the age group 15 – 40 years. In the same year, 120,000 people in the district visited the Voluntary Counseling and Testing (VCT) centre for an HIV test.

If a person was selected at random from the district in this year. Find the probability that the person visited a VCT centre and was in the age group 15 – 40 years.

12.(a) Two integers x and y are selected at random from the integers 1 to 8. If the same integer may be selected twice, find the probability that

- (i) $|x - y| = 2$
- (ii) $|x - y|$ is 5 or more
- (iii) $x > y$

- (b) A die is biased so that when tossed, the probability of a number r showing up, is given by $p \propto Kr$ where K is a constant and $r = 1, 2, 3, 4, 5$ and 6 (the number on the faces of the die)
- (i) Find the value of K
- (ii) If the die is tossed twice, calculate the probability that the total score is 11
- 13.** Two bags A and B contain identical balls except for the colours. Bag A contains 4 red balls and 2 yellow balls. Bag B contains 2 red balls and 3 yellow balls.
- (a) If a ball is drawn at random from each bag, find the probability that both balls are of the same colour.
- (b) If two balls are drawn at random from each bag, one at a time without replacement, find the probability that:
- (i) The two balls drawn from bag A or bag B are red
- (ii) All the four balls drawn are red
- 14.** During inter – school competitions, football and volleyball teams from Mokagu high school took part. The probability that their football and volleyball teams would win were $\frac{3}{8}$ and $\frac{4}{7}$ respectively.
- Find the probability that
- (a) Both their football and volleyball teams
- (b) At least one of their teams won
- 15.** A science club is made up of 5 boys and 7 girls. The club has 3 officials. Using a tree diagram or otherwise find the probability that:
- (a) The club officials are all boys
- (b) Two of the officials are girls
- 16.** Chicks on Onyango's farm were noted to have either brown feathers brown or black tail feathers. Of those with black feathers $\frac{2}{3}$ were female while $\frac{2}{5}$ of those with brown feathers were male. Otieno bought two chicks from Onyango. One had black tail feathers while the other had brown find the probability that Otieno's chicks were not of the same gender

17. Three representatives are to be selected randomly from a group of 7 girls and 8 boys. Calculate the probability of selecting two girls and one boy
18. The probability that a man wins a game is $\frac{3}{4}$. He plays the game until he wins. Determine the probability that he wins in the fifth round.
19. The probability that Kamau will be selected for his school's basketball team is $\frac{1}{4}$. If he is selected for the basketball team. Then the probability that he will be selected for football is $\frac{1}{3}$ if he is not selected for basketball then the probability that he is selected for football is $\frac{4}{5}$. What is the probability that Kamau is selected for at least one of the two games?
20. Two baskets A and B each contains a mixture of oranges and lemons. Basket A contains 26 oranges and 13 lemons. Basket B contains 18 oranges and 15 lemons. A child selected a basket at random and picked at random a fruit from it. Determine the probability that the fruit picked was an orange.

For Marking Schemes/Answers

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