

NAME \_\_\_\_\_ INDEX NUMBER \_\_\_\_\_

SCHOOL \_\_\_\_\_ DATE \_\_\_\_\_

## PROBABILITY

<i>KCSE 1989 – 2012 Form 3 Mathematics</i>	Working Space
<p>1. <b>1989 Q10 P2</b></p> <p>A contractor applies for two contracts: A - building a school workshop and B - building a school library</p> <p>The probability of getting contract A IS 0.6. The probability of getting contract B depends on whether or not A is obtained and is 0.7 if A is obtained but only 0.4 if A is not obtained. What is the probability of getting at least one contract (3marks)</p>	
<p>2. <b>1990 Q10 P1</b></p> <p>A bag contains 10 balls which 3 are red, 5 are white and 2 are green. Another bag Contains 12 balls of which 4 are red, 3 are white and 5 are green. A bag is chosen at Random and then a ball chosen at random from the bag. Find the probability that the Ball so chosen is red. (4 marks)</p>	

		Working Space
3.	<p><b>1990 Q18 P2</b></p> <p>At a factory 120 candidates have to be interviewed: 48 for carpentry, 32 for Masonry and 40 for plumbing. Past experience indicates that 80% would pass Carpentry, 45% would pass masonry and 60% would pass plumbing.</p> <p><b>a)</b> A candidate is picked at random. Find the probability that</p> <p><b>i)</b> He is to be interviewed for carpentry (1 mark)</p> <p><b>ii)</b> He is to be interviewed for masonry (2 marks)</p> <p><b>iii)</b> He would pass the interview. (3 marks)</p> <p><b>b)</b> How many candidates are expected to pass their interviews? (2 marks)</p>	
4.	<p><b>1991 Q10 P1</b></p> <p>There are two boxes labeled A and B on a table. Box A contains 5 red balls and 3 white balls, while box B contains 2 red balls and 6 white balls. A box is chosen at random and two balls are drawn from it, one after the other without replacement. Find the probability that the two balls chosen are of different colours. (4 marks)</p>	
5.	<p><b>1991 Q18b P2</b></p> <p>In a shooting practice three soldiers A, B and C aim at a target. The probabilities of A, B and C hitting the target are <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math> and <math>\frac{1}{2}</math> respectively. The three soldiers shot at the target only once; one after the other. What is the probability that the target was hit only once? (6 marks)</p>	

		Working Space
6.	<p><b>1992 Q9 P2</b></p> <p>The probability that Kamau will be selected for his school's basketball team is <math>\frac{1}{4}</math>. If he is selected for the basketball team, then the probability that he will be selected for football is <math>\frac{1}{3}</math>. If he is not selected for basketball then the probability that he is selected for football is <math>\frac{4}{5}</math>. What is the probability that Kamau is selected for at least one of the two games?</p> <p>(3 marks)</p>	
7.	<p><b>1993 Q13 P1</b></p> <p>Chicks on Onyango's farm were noted to have either brown or black feathers. Of those with black feathers <math>\frac{2}{3}</math> were female while <math>\frac{2}{5}</math> of those male. Otieno bought two chicks from Onyango. One had black tail feathers while the other one had brown. Find the probability that Otieno's chicks were not to the same gender.</p> <p>(4 marks)</p>	
8.	<p><b>1994 Q8 P1</b></p> <p>The probability that a man wins a game is <math>\frac{3}{4}</math>. He plays the game until he wins. Determine the probability that he wins in the fifth round.</p> <p>(3 marks)</p>	

		Working Space
9.	<b>1995 Q 8 P1</b> 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 basket at random and picked at random a fruit from it. Determine the probability that the fruit picked was an orange.	
10	<b>1995 Q 19 P2</b> 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	

		Working Space
11	<p><b>1996 Q 24 P1</b>  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.</p> <p>a) Determine the probability that the first pen picked is</p> <p>i) Blue (1 mark)  ii) Either green or red (1 mark)</p> <p>b) Using either a tree diagram determine the probability that</p> <p>i) The first two pens picked are both green. (3 marks)  ii) Only one of the first two pens picked is red (3 marks)</p>	
12	<p><b>1996 Q 6 P2</b>  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 <math>\frac{3}{8}</math> and <math>\frac{4}{7}</math> respectively. Find the probability that</p> <p>a) Both their football and volleyball teams won. (2 marks)  b) At least one of their teams won (2 marks)</p>	
13	<p><b>1997 Q 21 P1</b>  The water supply in a town depends entirely on two water pumps. A and B. The probability of pump A filling is 0.1 and the probability of pump B failing is 0.2. Calculate the probability that</p> <p>(a) Both pumps are working  (b) There is no water in the town  (c) Only one pump is working  (d) There is some water in the town</p>	

		Working Space
14	<p><b>1998 Q 24 P1</b></p> <p>In a livestock research stations a new drug for a certain fowl disease is being tried. A sample of 36 fowls was diagnosed to have the disease. Twenty (20) fowls were treated with the drug and the rest were not.</p> <p>(a) Calculate the probability that a fowl picked at random is</p> <p>(i) treated with the drug</p> <p>(ii) Not treated with the drug</p> <p>b) If a fowl is treated, probability of dying is <math>\frac{1}{10}</math> while if not treated the probability is <math>\frac{7}{10}</math> calculate the probability that, a fowl picked at random from the 36 fowl is treated with the drug and will die</p> <p>(i) Not treated with the drug and will die</p> <p>(ii) Not treated with the drug and will not die</p>	
15	<p><b>1998 Q 14 P2</b></p> <p>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:</p> <p>(a) The club official are all boys</p> <p>(b) Two of the officials are girls</p>	
16	<p><b>1999 Q 7 P1</b></p> <p>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</p>	

	15 limes. A child selected a basket at random and picked a fruit at a random from it.	Working Space
17	<p><b>2000 Q 18 P1</b></p> <p>In form 1 class there are 22 girls and boys. The probability of a girl completing the secondary education course is <math>\frac{3}{5}</math> whereas that of a boy is <math>\frac{2}{3}</math></p> <p>(a) A student is picked at random from class. Find the possibility that,</p> <p>(i) The student picked is a boy and will complete the course</p> <p>(ii) The student picked will complete the course</p> <p>(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.</p>	
18	<p><b>2000 Q 10 P2</b></p> <p>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.</p>	
19	<p><b>2001 Q 9 P1</b></p> <p>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.</p>	

Working Space

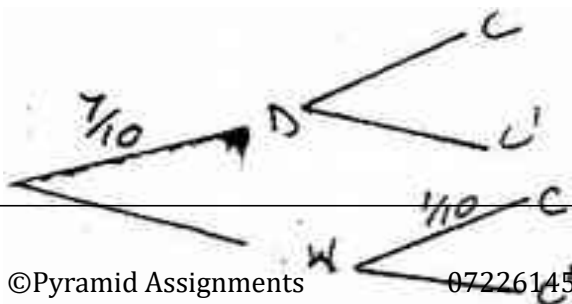
20 **2001 Q 23 P1**

The probability of three darts players Akinyi, Kamau, and Juma hitting the bulls eye are 0.2, 0.3 and 0.5 respectively.

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

21 **2002 Q 19 P1**

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.





	<p>What is the probability that:-</p> <p>i) The driver completes the rally</p> <p>ii) The weather was wet and the driver did not complete the rally?</p>	Working Space
22	<p><b>2003 Q 9 P1</b></p> <p>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.</p> <p>a) A wins the race</p> <p>b) Either B or C win the race. (3marks)</p>	
23	<p><b>2004 Q 7 P1</b></p> <p>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.</p> <p>Find the probability that the person visited a VCT centre and was in the age group 15 – 60 years.</p>	
24	<p><b>2005 Q 8 P1</b></p> <p>Two teachers are chosen randomly from a staff Consisting 3 women and 2 men to attend a HIV/AIDs</p>	

	<p>seminar. Calculate the probability that the two teachers chosen are:</p> <p>(a) Of the same sex</p> <p>(b) Of opposite sex</p>	Working Space
25	<p><b>2000 Q 10 P2</b></p> <p>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.</p>	
26	<p><b>2006 Q 20 P2</b></p> <p>(a) Two integers <math>x</math> and <math>y</math> are selected at random from the integers 1 to 8. If the same integer may be selected twice, find the probability that</p> <p>(i) <math>x - y = 2</math> (2 marks)</p> <p>(ii) <math>x - y</math> is more (2 marks)</p> <p>(iii) <math>x &gt; y</math> (2 marks)</p> <p>(b) A die is biased so that when tossed, the probability of a number <math>r</math> showing up, is given by <math>p \propto Kr</math> where <math>K</math> is a constant and <math>r = 1, 2, 3, 4, 5</math> and <math>6</math> (the number on the faces of the die</p> <p>(i) Find the value of <math>K</math> (2 marks)</p> <p>(ii) if the die is tossed twice, calculate the probability that the total score is 11 (2 marks)</p>	

	marks)	
27	<p><b>2007 Q 24 P2</b></p> <p>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.</p> <p>(a) If a ball is drawn at random from each bag, find the probability that both balls are of the same colour. (4 marks)</p> <p>(b) If two balls are drawn at random from each bag, one at a time without replacement, find the probability that:</p> <p>(i) The two balls drawn from bag A or bag B are red (4 marks)</p> <p>(ii) All the four balls drawn are red (2 marks)</p>	Working Space
28	<p><b>2008 Q 6 P2</b></p> <p>A student at a certain college has a 60% chance of passing an examination at the first attempt. Each time a student fails and repeats the examination his chances of passing are increased by 15% Calculate the probability that a student in the college passes an examination at the second or at the third attempt. (3marks)</p>	

		Working Space
29	<p><b>2009 Q 12 P2</b></p> <p>On a certain day, the probability that it rains is when it rains the probability that Omondi carried an umbrella is <math>\frac{2}{5}</math>. When it does not rain the probability that Omondi carries an umbrella is <math>\frac{1}{6}</math>. Find the probability that Omondi carried an umbrella that day</p> <p>(2 marks)</p>	

30

**2011 Q 6 P2**

The ages in years of five boys are 7, 8, 9, 10 and 11 while those of five girls are 4, 5, 6, 7 and 8. A boy and a girl are picked at random and the sum of their ages is recorded.

(i) Draw a probability space to show all the possible outcomes. (1 mark)

ii. Find the probability that the sum of their ages is at least 17 years (1 mark)