FORM FOUR CLUSTER KCSE MODEL 4

BIOLOGY PAPE 2 ANSWERS

SECTION A (20 Marks)

Answer all questions in the spaces provided.

1. (a) Pollen tube.√

(b) Embryo part C√ Endosperm part D √

(c) C Diploid.√ D Triploid.√

(d) Polar nuclei chemic ally leads growth of pollen tube to be micropyle of embryo sac;

Generative nucleus in the process mitotically divides into two nuclei namely; 1st and 2

and male nucleus; √ 1st male nucleus fuses with egg/ovum to form zygote while 2nd

male nucleus fuses with polar nuclei to form a triploid endosperm; √

2.

√

(b) Removal of cats will result into reduction in Hyena and leopard populations, leading

to increase in Zebra;√

(c) Python√ because it will accumulate the substances that cause pollution from

feeding on many other organisms;√

(d) Dry mass reflect accurate increase in biomass/living mass loss water mass in the

living organism; √ 3

3. (a) (i) Damp cotton provides moisture within the glass bottles. √

(ii) Silica gel absorbs moisture away within the glass bottle; √

(iii) Wax is used to seal the joints of bottles air-tight; √

(b) Termite ants in the glass bottle B moved to A √ in response to changes in moisture

concentration; √

(c) To avoid higher rate of excess moisture moving from A to B; √

(d) Damp cotton wool; √

4. (a) Parental genotypes :RR x rr √

(b) Parental genotypes for F2: Rr x Rr√

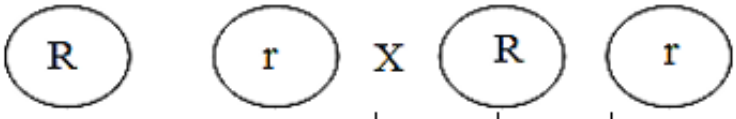
Gametes R, r x R, r Or

(a) Parental genotypes :RR x rr √

(b) Parental genotypes for F_2: Rr x Rr√

Gametes R, r x R, r

Or



Crossing

	R	r
R	RR	Rr
r	Rr	rr

F_2 Genotype		Phenotype
R R	———	Red flowered (Homozygous)
R r	———	Red flowered (Heterozygous)
R r	———	Red flowered (Heterozygous)
r r	———	Yellow flowered (Homozygous) √

(c) $\frac{1}{4} \times 3214$ √=803.5 (803) plants√ 2mks

5. (a) (i) Phagocytes attack and destroy foreign cells by engulfing. √ (1mk)

(ii) Lymphocytes attack and destroy foreign cells by way of secreted antibodies (1mk)

(b) (i) Damaged tissues release an enzyme called Thromboplastin (Thrombokinase). √

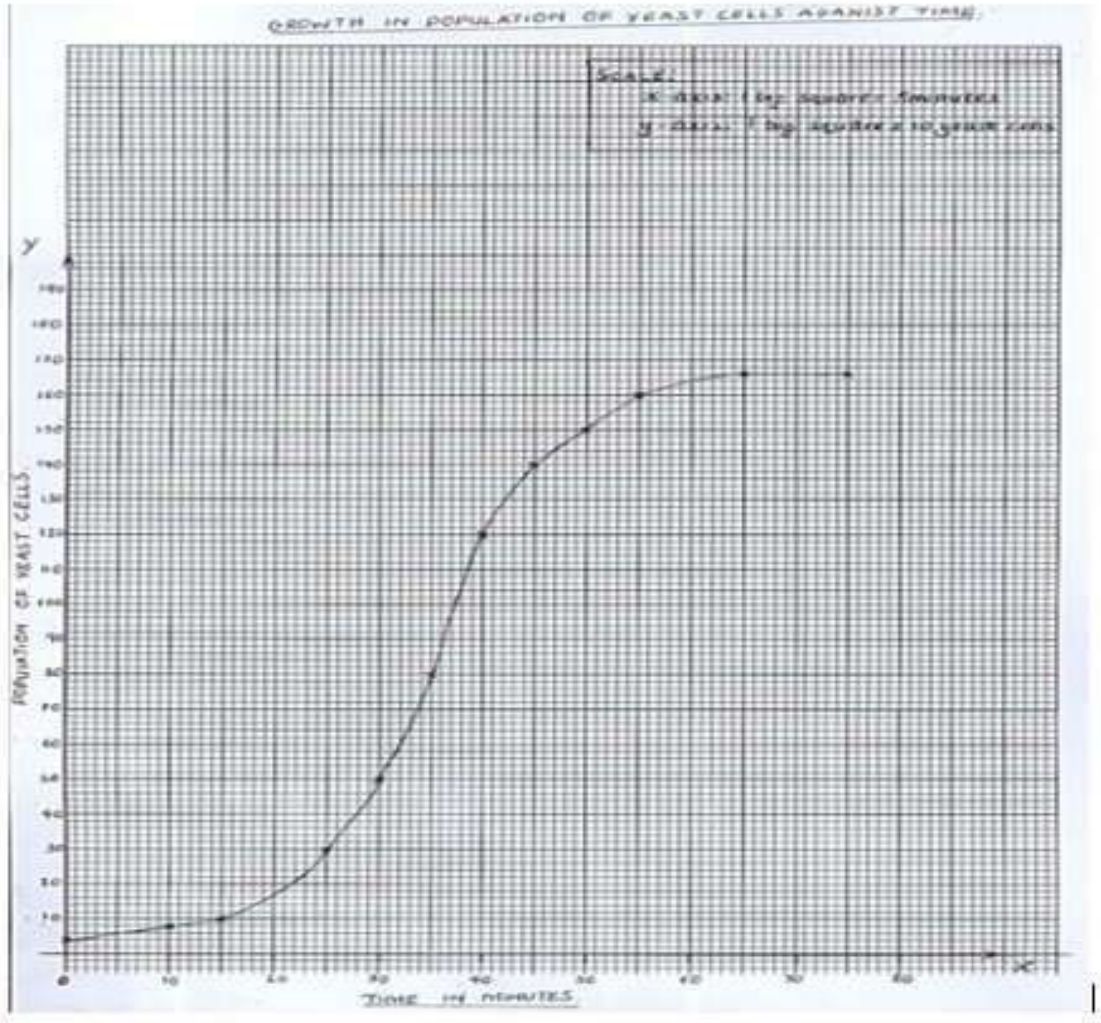
Thrombin changes fibrinogen (soluble) to insoluble fibrin. √Fibrin is made up of a meshwork of fibres that seals the wound by trapping red blood cells into a clot. √

(ii) Blood lose results into dehydration√ that may lead to changes in concentration of

body fluids away from normal ranges. √

SECTION B (20 Marks)

ANSWER QUESTION 6 (COMPULSORY) AND EITHER 7 OR 8



(b) Sigmoid curve (s) –curve √ (1mk)

(c) 92 yeast cells (1mk)

(d) 46.5 minutes. √ (2mks)

(e) $\frac{126-58}{42-32}$ minutes $= \frac{68}{10}$ √=6.8 yeast cells/minute (Reject where no units are shown) (3mks)

(f) The rate of increase in the number of yeast cells began to reduce. √This is because food resources started to limit increase in the number of yeast cells as a result of fairly increased population of yeast cells per unit area over the Petri dish, √ (2mks)

(g) -Death rate equals division rate of cells. √This will result into maintaining the population by replacing equal numbers of yeast cells that die out. √ (2mks)

-Temperature of the medium. √This is because temperature determines the rate of yeast division. Therefore if the temperature is repulated slightly below optimum the rate of cell division and death will be equaled by temperature. √

7. (a) External intercostal muscles contract; Internal intercostal muscles relax; Ribcage moves upwards and outwards; Diaphragm muscles contract such that the diaphragm flattens; volume of thoracic cavity increases; while pressure decreases; Air is drawn in through the nostrils; making the lungs to inflate; Oxygen diffuses in the moisture; and then diffuses across the alveoli into the blood; (10mks)

(b) In the presence of sunlight; photosynthesis takes place in the guard cells; glucose therefore increases in the cytoplasm of the guard cells; High glucose concentration increases solute concentration in the guard cells; osmotic pressure in the guard cell increases; This makes the guard cells to draw water by osmosis; from the adjacent

cells; This increases turgidity of guard cells; and because the inner walls of guard cells

are more thick than the outward; results in the opening of the stomata; √ (10mks)

8. Fossil record;

These are remains of ancient organism preserved in natural occurring materials for

many years; the show morphological changes of group of related organisms over a long

period of time; e.g. the human skull;

Geographical distribution;

The theory of continental drift supports that one time, the present continent formed

one large landmass; which later broke up and its parts drifted away from each other

due to the continental drifting; animals with common ancestry became isolated and

evolved into different species; egg camels of South America resemble those in Africa;

long tailed monkeys in Amazon resemble short tailed monkeys in Africa, the big cats in

Africa resemble a lot to those in other continents;

Comparative embryology;

Studies of the development of embryos in different vertebrates like fish, mammals