CHRISTIAN SOCIAL SERVICES COMMISSION
An Ecumenical Body of Tanzania Episcopal Conference and Christian Council of Tanzania
P.O. Box 9433, Dar es Salaam, Tanzania

CSSC-SOUTHERN ZONE FORM FOUR JOINT EXAMINATION

033/2A **BIOLOGY 2A (ACTUAL PRACTICAL)** **AUGUST 2024**

MARKING SCHEME

1. (i) The piece placed in beaker A absorbed water and became hard and stiff (targed) while the piece placed in beaker B lost water and became thin and tender **(04 marks)**

(ii) Specimen in beaker A absorbed water by osmosis as it had high concentration compared to the surroundings while specimen in beaker B lost to the surrounding as had low concentration. **(04 marks)**

(iii) Osmosis **(2 marks)**

Osmosis is the process whereby water molecules move from the region of low concentration to the region of high concentration through semi-permeable membrane. **(2 marks)**

(iv) Factors affecting the rate of osmosis

- Temperature
- Concentration gradient
- Nature of the membrane **(any three @ 2 marks = 06 marks)**

(v) Application of osmosis in plants

- Absorption of water and dissolved mineral salts by plant roots
- Opening and closing of stomata
- Balancing of sugar in plant tissues **(any two @ 1.5 marks = 3 marks)**

(vi) Solution A was hypotonic solution **(2 marks)**

Solution B was hypertonic solution **(2 marks)**

2. a) (i) common names of the specimen

specimen	Common names
A	Cactus
B	Earthworm
C	Crab
E	Bean seed

(1mark @ = 4mark)

(ii) Classification of specimen A, B, C and E

specimen	Kingdom	Phylum	Class
A	Plantae	Angiospermophyta	Dicotyledoneae
B	Animalia	Annelida	Oligochaeta
C	Animalia	Arthropoda	Crustacea
E	Plantae	Angiospermophyta	Dicotyledoneae

(1/2mark @ = 6 marks)

b) (i) Adaptation of specimen A and C in their environment

Adaptation of specimen A	Adaptation of specimen C
i. leaves are reduced to spines to reduce water loss through transpiration ii. They have wide and deep roots to absorb water deep underground. iii. They have very thick cuticle made up of waxy material to reduce water loss iv. The stems of the cactus are modified to perform the functions of leaves, they become green to perform photosynthesis	i. They have an outer shell (exoskeleton) that offer protection against predation ii. They have claws (pincers) which they use to hunt prey or fight predators iii. They have gills for gaseous exchange iv. They exhibit a wide range of colors and patterns, this serve as camouflage making them difficult to be caught predators
(Any two 1mark @ = 2 marks)	**(Any two 1mark @ = 2 marks)**

(ii) Importance of specimen B to farmers

- They improve soil aeration through burrowing
- They are used for commercial production of composite manure
- Some are used as bait in fishing industry
- They are decomposers aid in soil nutrients circulation
- Their excretory waste increases soil particles. This in turn increases water holding capacity of the soil

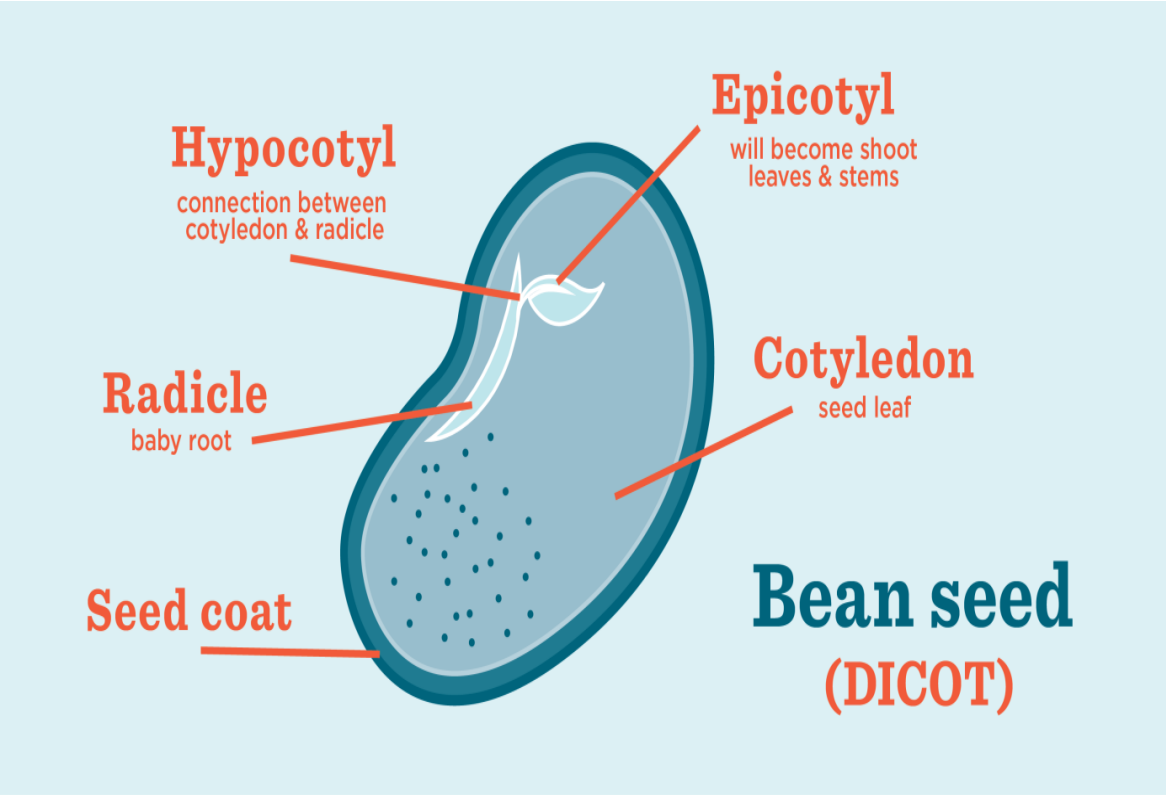
(Any four @1mark = 4 marks)

c) (i) They have perfect segmented bodies **(1 marks)**
Their body is made up of chaetae along the body **(1 marks)**

ii) Type of skeleton and their functions

specimen	Type of skeleton	Functions
B	Hydrostatic skeleton **½ mark**	• It maintain the shape of earthworms • It allows locomotion **Any one point = ½ mark**
C	Exoskeleton **½ mark**	• It offer protection to crabs • It allows movement **Any one point = ½ mark**

d)


Epicotyl
will become shoot leaves & stems
Hypocotyl
connection between cotyledon & radicle
Cotyledon
seed leaf
Radicle
baby root
Seed coat
Bean seed
(DICOT)

3 marks