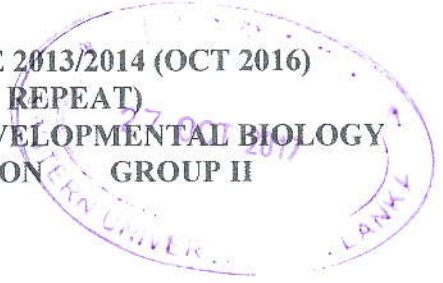


SECOND YEAR EXAMINATION IN SCIENCE 2013/2014 (OCT 2016)  
SECOND SEMESTER (PROPER & REPEAT)  
ZL 253 & ZL 255 EUKARYOTIC GENETICS & DEVELOPMENTAL BIOLOGY  
PRACTICAL EXAMINATION GROUP II



Time: 02 ½ hours.  
Answer all questions.

1. Match the following **A – J**.  
Attach this sheet with your answer scripts. ( 10 marks)
2. Write one significance or importance of the following **K – T** in the study of Genetics and Developmental Biology. ( 20 marks)
3. Answer the following questions based on the figure **U**.
  - i). Provide a heading for this figure / structure.
  - ii) Label **a – f** of the figure /structure .U.
  - iii). Name the hormone that is secreted by this figure/structure.
  - iv). Give the function of this hormone that you have mentioned in 2 ( iii).
  - v). Which substances could be transported through this figure/structure? ( 15 marks)
4. Identify the immature stages of **V – Z** and indicate the type of metamorphosis. ( 10 marks)
5. The MN blood group system in human is governed by a pair of codominant alleles  $L^M$  and  $L^N$ . A sample of 208 Bedouins in the Syrian Desert was tested for the presence of the M and N antigens and found to contain 119 group M, 76 group MN and 13 group N.
  - a). Calculate the gene frequencies of  $L^M$  and  $L^N$ .
  - b). If the frequency  $L^M = 0.3$ , how many individuals in a sample of size 500 would be expected to belong to group MN? ( 15 marks)
6. In the plant genus *Melandrium*, sex determination is similar to that in humans. A sex linked gene **b** is known to be lethal when homozygous is female. When present in hemizygous condition in males (**bY**) it produces blotchy patches of yellow green colour. The homozygous or heterozygous condition of the wild type allele (**BB or Bb**) in females or the hemizygous condition in males (**BY**) produces normal dark green colour. From a cross between heterozygous females and yellow green males, predict the phenotypic ratio expected in the progeny. ( 10 marks)  
(contd....)

7. A fully heterozygous *Drosophila* fly resulting from a cross between a wild type fly showing three recessive traits - rosy eyes ( r ), ebony body ( e ) and spineless was crossed with another *Drosophila* fly showing the recessive traits. The following offspring were obtained.

Wild type	410
ebony, rosy, spine less	411
rosy, spineless	58
ebony	56
ebony, spineless	28
rosy	29
spineless	05
ebony, rosy	03

Answer the following questions based on the above data.

- Are these genes linked?
- If so, give the middle gene and gene order.
- Give the map distance between the genes.
- Are there any interference between the genes?
- If so, give the coefficient of coincidence and interference.

XXXXXXXXXXXX

Q1. Match the following.

Index No:

Attach this sheet with your answer scripts (10 marks)

- |   |                              |                                   |
|---|------------------------------|-----------------------------------|
| A | DNA finger printing          | i). Screening for mutations       |
| B | IUI                          | ii). Forensic medicine            |
| C | Replica plating              | iii). Causes pregnancy            |
| D | Follicle stimulating hormone | iv). Progesterone                 |
| E | Endometrium                  | v). Chick                         |
| F | Blastema                     | vi). Grafian follicle development |
| G | IUD                          | vii). Contraceptive method        |
| H | Mongoloid                    | viii). Wound healing              |
| I | Telolecithal egg             | ix). Trisomy 18                   |
| J | Edwards syndrome             | x). Trisomy 21                    |