LSE-06

ASSIGNMENT

Bachelor in Science Programme (B.Sc.)

DEVELOPMENTAL BIOLOGY

(Valid from 1st January, 2013 to 31st December, 2013)

Please Note

- You can take electives (56 or 64 credits) from a minimum of TWO and a maximum of FOUR science disciplines, viz. Chemistry, Life Sciences, Physics and Mathematics.
- You can opt for elective courses worth a MINIMUM OF 8 CREDITS and a MAXIMUM OF 48 CREDITS from any of these four disciplines.
- At least 25% of the total credits that you register for in the elective courses from Chemistry, Life Sciences and Physics disciplines must be from the laboratory courses. For example, if you opt for a total of 64 credits of electives in these 3 disciplines, at least 16 credits should be from laboratory courses.
- You cannot appear in the Term-End Examination of any course without registering for the course. Otherwise, your result will not be declared and the onus will be on you.

SCHOOL OF SCIENCES
Indira Gandhi National Open University
Maidan Garhi
New Delhi – 110 068

(For January 2013 Cycle)

ASSIGNMENT

Developmental Biology

Valid from 1st January, 2013 to 31st December, 2013

Dear Student,

You are required to do one assignment for this elective course. The instructions for doing the assignment are given in the Programme Guide under the **Section 7.1 – Assignments. Please read the instructions carefully before you start to prepare your assignment response.**

- You are required to submit your assignment response *within fourteen weeks* of the receipt of this assignment to **the Coordinator** of your Study Centre.
- Please **retain a copy** of your assignment response for your record.

We wish you good luck

Course Team
(Developmental Biology, LSE-06)

ASSIGNMENT

Assignment Code: LSE-06/TMA/2013
Max. Marks: 100

PART-1 (Plant Developmental Biology)

1. What is polyembryony? Briefly explain the main types of polyembryony in flowering plants. Describe its utility in agriculture and horticulture. **10**

2. With the help of examples describe the agents that mediate cross-pollination in plants. Detail the devices evolved by plants to encourage cross-pollination. **10**

3. With the help of clear and well-labelled diagrammes explain the production process of virus-free plants through shoot tip culture. **10**

4. Write short notes on the following:

   (i) Incompatibility
   (ii) Double fertilization **10**

5. Represent the following with the help of clear and well-labelled diagrammes:

   (i) *Avena* coleoptile growth experiment of F.W. Went
   (ii) A typical ovule in longitudinal section **10**

PART-2 (Animal Developmental Biology)

6. (a) With the help of a well labelled diagram describe the structure of the egg in amphibians and compare it with the structure of the ovum in mammals. What is the role of secondary egg envelops in vertebrates? **5**

   (b) Define gastrulation. Stepwise list the features of gastrulation in chick. How is it different from gastrulation in anamniotes? **5**

7. (a) Describe neurulation in chick with the help of suitable diagrams. What types of morphogenetic processes are involved in neurulation? **5**

   (b) Make a chart to show the interaction of various hormones which cause metamorphosis in amphibians and insects. **5**

8. (a) In *Xenopus* embryo what type of cells are produced by: **3**

(i) Animal cells
(ii) Vegetal cells
(iii) Equatorial cells

(b) Describe the experiment that showed primary induction of the mesodermal cells in *Xenopus*. **2**

(c) Giving an example explain the secondary permissive induction of embryonic tissue. **5**

9. (a) Define the following terms: **5**

(i) Neoteny
(ii) Incomplete metamorphosis
(iii) Imaginal disc
(iv) Morphollaxis
(v) Epimorphosis

(b) Describe the sequence of events in limb regeneration in urodele amphibians. What is the importance of AER? **5**

10. (a) What kinds of physiological and biochemical changes in the body can be correlated with aging? Explain the concept of programmed cell death in relation to aging. **5**

(b) Explain why cancer is considered a result of error in development processes. **5**