ASSIGNMENT

Bachelor in Science Programme
(B.Sc.)

DEVELOPMENTAL BIOLOGY

(Valid from 1st July, 2012 to 31st March, 2013)

Please Note

- You can take electives (56 to 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 lab. 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.
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/2012-13
Max. Marks: 100

PART-1 (Plant Developmental Biology)

1. Make a diagrammatic sketch of a mature anther as seen in transverse section. Write the characteristic features of the cells that constitute a fully developed anther. 4

2. What is the direction of flow of nutrients in an ovule? Which tissues are involved in flow of nutrients? Use a diagram to clarify your answer. 4

3. Describe the finer details of the events that follow the release of the contents of the pollen tube in the embryo sac. 4

4. Differentiate between simple and multiple polyembryony. Mention the names of the sexual and asexual tissues/structures that give rise to polyembryos and write the ploidy levels of these embryos. 4

5. Using clear and labelled diagrams highlight the histological changes that occur in the ovule of Gossypium spp. during the development of its seed coat, fuzz and lint hairs. 4

6. Prepare an account on floral development in plants including these aspects: conditions required by plants for floral initiation, morphological changes accompanying floral induction, and the prominent molecular events that follow floral induction. 4

7. Elaborate the ensuing aspects of senescence in plants: different ways of senescence, Richmond & Long effect, roles of light-dark periods and plant growth regulators. 4

8. Give any two applications of apical dominance in plants. 4

9. Write the source, origin, properties and uses of commercial cork. The cork is cut in which plane for use as bottle-cork and why? 4

10. ‘The phenomenon of embryogenesis is not necessarily confined to the reproductive cycle’. Justify this statement. 4

11. Citing any two examples describe the structure of micropylar and chalazal haustoria of endosperm. Mention the names of the structures where these haustoria extend. Make labelled diagrams of the two examples discussed. 5

12. Where is the male germ unit organized? What are its components? Mention their roles. Name the techniques that helped us in knowing their finer details. 5
13. With the help of a well labelled diagram describe the three phases of spermatogenesis in vertebrates.  

14. Define cleavage and elaborate upon the characteristic features of cleavage.  

15. (a) Differentiate between regulative and mosaic embryos.  
(b) Describe with the help of well labelled diagrams the process of neurulation in amphibian embryo.  

16. (a) Diagrammatically show the stages of development of cornea in chick embryo.  
(b) During vertebrate limb development what would happen and why if from the prospective fore limb area:  
(i) the central part of the disc (including mesoderm and ectoderm or mesoderm alone) is removed?  
(ii) if the entire disc including the outer ring is removed?  

17. (a) Match the animal groups given in Column I with their respective larval forms given in Column II.  

<table>
<thead>
<tr>
<th>Column I (animal group)</th>
<th>Column II (larval form)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Sponges</td>
<td>(a) tornaria</td>
</tr>
<tr>
<td>(ii) Trematodes</td>
<td>(b) bipinnaria</td>
</tr>
<tr>
<td>(iii) Hemichordates</td>
<td>(c) sporocyst</td>
</tr>
<tr>
<td>(iv) Echinoderms</td>
<td>(d) amphiblastula</td>
</tr>
</tbody>
</table>
(b) List the various patterns of metamorphosis that occur in insects and describe the process of metamorphosis that takes place in Apterygota insects.  

18. (a) Differentiate between allometric and isometric growth.  
(b) Describe the role of extrinsic factors in governing growth.  

19. Describe the foetal development in the human embryo from the third month up to the eighth month.  

20. Write short notes on the following:  
(a) Embolic morphogenetic movements  
(b) Ooplasmic determinants and somatic differentiation in tunicates  
(c) Lens regeneration from iris in Notophthalmus viridescens  
(d) Proto-oncongenes