



Name :
Roll No. :
Invigilator's Signature :

CS/B.Sc.(H), GENETICS/SEM-4/DEG-404/2012

2012

DEVELOPMENTAL GENETICS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct answers for any *ten* of the following :

10 × 1 = 10

- i) The Casein gene activation pathway is the example of
 - a) Smad pathway b) STAT pathway
 - c) Hedgehog pathway d) Wnt pathway.
- ii) Member of the Hedgehog protein family functions by binding to a receptor called
 - a) Bicoid b) Frizzled
 - c) Smoothened d) Patched.
- iii) The importance of the cell death pathway was recognized by awarding a Nobel Prize in the year
 - a) 2004 b) 2002
 - c) 2001 d) 2003.

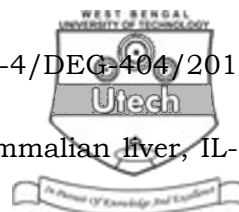
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- iv) Phenotypic plasticity in *Bicyclus anynana* is regulated by
- a) Food b) Temperature
- c) Pressure d) Gravity.
- v) Polyphenism in the tadpole of spadefoot toad is due to
- a) Alternative nutritional condition
- b) Alternative environmental condition
- c) Presence of predator
- d) None of these.
- vi) When proteins synthesized by one cell can diffuse over small distances to induce changes in neighboring cells' the event is called a
- a) juxtracrine interaction
- b) paracrine interaction
- c) endocrine interaction
- d) autocrine interaction.
- vii) 'TGF- β ' is a/an
- a) Paracrine factor b) Histone protein
- c) Mt protein d) Endocrine factor.
- viii) Placentation occurs in case of
- a) chick b) zebrafish
- c) worm d) mouse.
- ix) Terratogenesis means production of abnormal
- a) male b) female
- c) faetus d) none of these.
- x) The "germ plasm" theory was proposed by
- a) H. Driesch b) W. Roux
- c) A. Weismann d) none of these.

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- xi) In compensatory regeneration in mammalian liver, IL-6 is secreted by
- a) Stellate cells b) Kupffer cells
c) Hepatocytes d) none of these.
- xii) Cytoplasm that contains many nuclei is called
- a) Sarcoplasm b) Axoplasm
c) Syncytium d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What is apoptosis ? Compare the apoptotic pathway of nematodes and mammals. $1 + 4$
3. What are 'morphogenetic fields' ? Why morphogenetic field is called an important concept in developmental biology ?
4. Write short note on Oxidative damage as cause of Ageing.
5. Define autonomous and conditional specification with example.
6. Define genetic heterogeneity and pleiotropy.

GROUP – C

(Long Answer Type Questions)

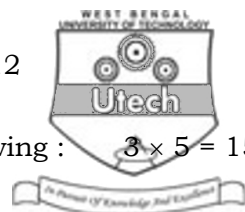
Answer any *three* of the following. $3 \times 15 = 45$

7. What is metamorphosis climax ? Describe the role of thyroid hormone in metabolism of anuran form. How does thyroid hormone-somatic interaction take place in amphibian species ? What is progenesis ? $2 + 6 + 4 + 3$

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8. Write short notes on any three of the following : $3 \times 5 = 15$
- a) The Wnt pathway
 - b) The Smad pathway
 - c) Hormonal role in insect metamorphosis
 - d) Syncytial cell specification.
9. a) What do you mean by environmental regulation of animal development ?
- b) What is phenotypic plasticity ? "Symbiotic relationship of some animals plays a role in their development." Describe this statement with suitable examples.
- $2 + 3 + 10$
10. a) What is molecular parsimony ?
- b) Describe about any two mechanisms of macroevolutionary change.
- c) Write a short note on environmentally adaptive nervous system.
- $2 + 8 + 5$
11. How mutation in splice sites and splicing factors produce inborn error ? Fragile X syndrome occurs due to the inborn error of translation. Explain. How retinoic acid causes teratogenicity in human ?
- $5 + 5 + 5$
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