



Name :

Roll No. :

Invigilator's Signature :

**CS/PBIR(PHMB/PHMC)/SEM-2/PHMB/PHMC-202/2013
2013**

NEUROBIOLOGY & DEVELOPMENTAL BIOLOGY

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
(Neurobiology)**

Answer Question No. 1 any *three* from Module I.

1. Answer *True* or *False* (*T/F*) : 5 × 1 = 5
- a) GABA is a fast excitatory neurotransmitter in the central nervous system.
 - b) Drugs for schizophrenia generally decrease dopamine activity in one of the circuits.
 - c) In skeletal muscle, acetyl choline (Ach), binds to muscarinic AChR and in cardiac muscle it binds to nicotinic AChR.

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- d) Inhibitors of acetylcholine esterase are used as drugs for Alzheimer's disease.
- e) The NMDA receptor of glutamate is generally associated with Ca^{++} channel.

Module - I

Answer any *three* of the following. $3 \times 10 = 30$

2. Describe at least three properties that distinguish a neurotransmitter from a neuromodulator. Can you describe the basic steps involved in the action of a neuromodulator ?
3. State the procedure employed for the identification of the GABA circuits in the mammalian brain. Name the different drugs/chemicals that exert their effect by interaction with GABA receptor.
4. What are the different types of glutamate receptors that you are familiar with ? State briefly the experiments that indicate their involvement with the storage/retrieval of memory.
5. Describe how dopamine, norepinephrine and serotonin differ in terms of their biological function. How do the following drugs modulate their activity ?
 - a) Reserpine
 - b) Amphetamine
 - c) Pargyline
 - d) Chlorpromazine
 - e) Desipramine.



GROUP - B
(Developmental Biology)

Answer Question No. 1 any *four* from Module I.

6. Answer any *five* of the following : 5 × 1 = 5
- a) Name two genes responsible for imparting pleuro-potency in embryonic cells.
 - b) In which stage of development are totipotent cells present ?
 - c) Name a teratogenic agent responsible for mimicking hormones.
 - d) What is the function of homeotic gene ?
 - e) What is Progeria ?
 - f) What is the function of acrosome in sperm ?
 - g) What is capacitation ?

Module - I

Answer any *four* of the following. 4 × 7½ = 30

- 7. What is metamorphosis ? Explain the morphological changes and hormonal control of amphibian metamorphosis.
- 8. What are the causes of aging ? Explain the genetic pathway that regulated aging in different organisms.
- 9. What are the functions of homeotic selector genes in *Drosophila* ? Explain.

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10. What is teratogenesis ? Describe the period of maximum susceptibility of teratogen during embryonic development.
11. What is tubal pregnancy ? Explain the mechanism of implantation of an embryo in the uterus.
12. Explain the molecular mechanism of flagellar movement of sperm.

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