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(NEP—2020)

(2nd Semester)

ZOOLOGY (MAJOR)

(Evolution and Ethology)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(Marks : 10)

Tick (✓) the correct answer in the brackets provided :

1×10=10

1. The theory of natural selection was independently discovered by Charles Darwin and

(a) Jean-Baptiste Lamarck ()

(b) August Weismann ()

(c) Ivan Pavlov ()

(d) Alfred R. Wallace ()

2. Industrial melanism is an example of

(a) defensive adaptation of skin against ultraviolet radiation ()

(b) drug resistance ()

(c) directional selection and camouflage ()

(d) protective resemblance with the surrounding ()

3. The inherited behaviour is called
- (a) imprinting ()
 - (b) maturation ()
 - (c) operant ()
 - (d) instinct ()
4. According to Out of Africa theory, modern human first evolved in
- (a) Europe ()
 - (b) Africa ()
 - (c) North America ()
 - (d) Asia ()
5. A sensitive phase and critical period are associated with what type of behaviour?
- (a) Cognitive ()
 - (b) Kinesis ()
 - (c) Imprinting ()
 - (d) Conspecific ()
6. In Müllerian mimicry, the mimic is
- (a) harmless but resembles an obnoxious model ()
 - (b) harmless but resembles the background ()
 - (c) harmless but resembles a non-toxic model ()
 - (d) harmless but resembles model which is also harmful to predators ()
7. The species *Homo habilis* was named because it was
- (a) able to use hand tools ()
 - (b) the first to use fire ()
 - (c) the originator of agriculture ()
 - (d) capable of speaking complex language ()

8. In *Angomonas deanei*, ATP is synthesized by
(a) a bacterium ()
(b) kinetoplast ()
(c) glycosome ()
(d) mitochondria ()
9. Melatonin is a hormone that regulates
(a) gestation (child birth) ()
(b) secondary sexual characters ()
(c) sleep-wake cycle ()
(d) mammary gland secretion ()
10. Infrasound is a communication used by
(a) elephants ()
(b) chimpanzees ()
(c) dolphins ()
(d) microbats ()

(SECTION : B—SHORT ANSWERS)

(Marks : 15)

Write notes on *five* of the following, taking at least *one* from each Unit : 3×5=15

UNIT—I

1. Main postulates of natural selection theory
2. Sickle cell trait

UNIT—II

3. Salient points of RNA world hypothesis
4. Mitochondrial eve

UNIT—III

5. Batesian mimicry
6. Innate behaviour

UNIT—IV

7. Adrenaline
8. Waggle dance

(SECTION : C—DESCRIPTIVE)

(Marks : 50)

Answer *five* questions, taking at least *one* from each Unit :

10×5=50

UNIT—I

1. Explain how industrial melanism provides a good example of natural selection.
2. Give an account of prebiotic soup theory with an emphasis on Miller's experiment with the help of diagram.

UNIT—II

3. Discuss the major hominin fossils leading to the origin of *Homo sapiens*.
4. Describe the concept of symbiogenesis based on *Mixotricha paradoxa* as an example.

UNIT—III

5. Write an essay on major types of coloration in animals.
6. What are the features of altruism? Discuss how reciprocal altruism is benefited by animals.

UNIT—IV

7. Describe the phenomenon of evolutionary arms race giving suitable examples.
8. What are the behavioural functions of steroids and melatonin?
