

Chapter 1

Reproduction in Organisms

Solutions

SECTION - A

Objective Type Questions

(Life Span)

1. Which of the following statements is **not** true?
- (1) Life span is the period from birth to the natural death of an organism
 - (2) All small organisms have very short life span
 - (3) Life expectancy is the characteristic of a population
 - (4) Maximum life span is the characteristic of a species

Sol. Answer (2)

Life spans of organisms are not necessarily correlated with their sizes e.g., life span of crow is 15 years, life span of parrot is 140 years, but their sizes do not show much difference.

2. Which of the following pairs of animals have almost similar maximum life spans?
- (1) Ant queen and squirrel
 - (2) Toad and house mouse
 - (3) Bull frog and house rat
 - (4) Carp and guinea-pig

Sol. Answer (1)

	Max. life span (years)
Ant queen	→ 15
Similar {	
Squirrel	→ 16
Carp	→ 47
Guinea pig	→ 7.5
Toad	→ 36
House mouse	→ 3.5
Bull frog	→ 30
House rat	→ 4.6

3. Which of the following is the largest animal?

- (1) Whale (2) Giant tortoise (3) Hippopotamus (4) Elephant

Sol. Answer (1)

Factual information.

(Reproduction)

4. Which of the following plays an important role in controlling reproduction?

- a. Day length
b. Nervous system
c. Endocrine system

- (1) c only (2) b only (3) b and c only (4) a, b and c

Sol. Answer (4)

Day length is related to circadian rhythm, maintained by pineal gland (an endocrine gland).

Nervous system is related to hypothalamic neurons releasing GnRH. GnRH stimulates pituitary to release gonadotropins

5. Which of the following pheromones is involved in sexual reproduction in silk moth?

- (1) Civetone (2) Bombykol (3) Ecdysone (4) Villikin

Sol. Answer (2)

Civetone is a pheromone in cats.

Ecdysone is moulting hormone in insects.

Villikin is a GIT hormone.

6. Eggs are covered with a tough, leathery coat in case of

- (1) Sharks (2) Bony fishes (3) Lizards (4) Urochordates

Sol. Answer (3)

Lizards have cleidoic eggs.

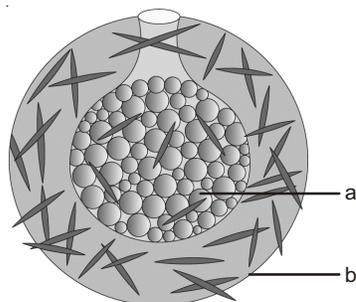
7. External syngamy occurs in case of

- (1) Reptiles (2) Birds (3) Mammals (4) Bony fishes

Sol. Answer (4)

External fertilization occurs in bony fishes. In reptiles, aves and mammals, internal fertilization occurs.

8. Look at the given figure and find out the statements **wrong** regarding the **gemmule formation**.



- A. 'b' refers to an archeocyte and 'a' refers to a gemmule
 B. Gemmule formation takes place only in marine sponges
 C. On germination, each gemmule gives rise to many offsprings
 D. Gemmule formation is a kind of spore formation
- (1) D only (2) A & B
 (3) A, B & C (4) A, B, C & D

Sol. Answer (4)

'a' refers to an archeocyte

'b' refers to outer wall of gemmule

Gemmule formation takes in all fresh water sponges and some marine sponges.

On germination, each gemmule gives rise to one offspring.

Gemmule formation is endogenous budding.

9. Which type of asexual reproduction is observed in *Hydra*?
- (1) Exogenous budding (2) Endogenous budding
 (3) Gemmule formation (4) Both (1) and (3)

Sol. Answer (1)

Hydra shows exogenous budding.

Endogenous budding = Gemmule formation.

10. Which of the following statement is **correct**?
- (1) Small number of gametes are released by animals performing external fertilisation
 (2) Chimpanzee exhibits oestrous cycle
 (3) Oviparous animals always lay fertilised eggs covered by hard calcareous shell
 (4) The type of parthenogenesis observed in honeybees is arrhenotoky

Sol. Answer (4)

Large number of gametes are released by animals performing external fertilization to increase the chances of successful syngamy.

Chimpanzee is a primate mammal exhibiting menstrual cycle.

Oviparous animals are egg-laying. Eggs may be fertilized or unfertilized.

Arrhenotoky is a type of parthenogenesis in which only males are produced e.g., honey bees, wasps, turkeys, rotifers.

11. Monoestrous animals have
- (1) One ovulation each month
 (2) One heat period each month
 (3) One breeding season in a year
 (4) One menstrual cycle each month

Sol. Answer (3)

Monoestrous animals undergo only one oestrous cycle in their breeding period/season.

12. In mammals the sheep, cow, rat etc. show reproduction during

- (1) Oestrus phase
- (2) Anoestrous phase
- (3) Menstrual phase
- (4) Diapause phase

Sol. Answer (1)

In non-primate mammals like cow, sheep, rat, deer, dog, tiger etc, cyclical changes (in ovaries and accessory ducts) that occur during reproduction are referred to as oestrus cycle. These mammals show reproduction during oestrus phase. Menstrual phase is present in primate females.

Diapause phase : Delay in development in response to regularly and recurring periods of adverse environmental conditions. It is dynamic phase in insects.

SECTION - B

Previous Years Questions

1. Development of an organism from female gamete/egg without involving fertilization is

- (1) Adventitive embryony
- (2) Polyembryony
- (3) Parthenocarpy
- (4) Parthenogenesis

Sol. Answer (4)

Polyembryony is presence of more than one embryos.

2. A population of genetically identical individuals, obtained from asexual reproduction is

- (1) Callus
- (2) Clone
- (3) Deme
- (4) Aggregate

Sol. Answer (2)

Clone refers to morphologically and genetically similar individuals. Each individual of a clone is referred to as ramet.

3. Syngamy means

- (1) Fusion of gametes
- (2) Fusion of cytoplasm
- (3) Fusion of two similar spores
- (4) Fusion of two dissimilar spores

Sol. Answer (1)

Fusion of similar gametes → Isogamy

Fusion of dissimilar gametes → Anisogamy

4. Estrous cycle is indication of
(1) Breeding period (2) Estrogen secretion (3) Pregnancy (4) Menopause

Sol. Answer (1)

Estrous cycle refers to cyclical changes in ovaries and accessory ducts occurring during reproduction in non-primates females..

5. Estrous cycle is characteristic of
(1) Human females (2) All mammalian females
(3) Mammalian females other than primates (4) Mammals

Sol. Answer (3)

Primate females exhibit menstrual cycle.

Non primate mammals (females) exhibit estrous cycle.

6. Binary fission is a type of
(1) Vegetative propagation (2) Asexual reproduction
(3) Sexual reproduction (4) Nuclear fragmentation

Sol. Answer (2)

In binary fission a cell divides into two daughter cells e.g., *Amoeba*, *Paramecium*.

7. Maximum life span of dog in years is
(1) 5 (2) 10 (3) 15 (4) 20

Sol. Answer (4)

Fact (maximum life span is characteristic of species)

8. Menstrual cycle occurs in
(1) Female primates (2) Human females (3) All mammalian females (4) Rabbit

Sol. Answer (1)

Female primates include human females.

9. Hermaphrodite animal is
(1) Spider (2) Honey bee (3) *Ascaris* (4) Leech

Sol. Answer (4)

Leech is bisexual/hermaphrodite, others are unisexual.

10. Transverse binary fission occurs in
(1) *Euglena* (2) *Amoeba*
(3) *Hydra* (4) *Paramecium*

Sol. Answer (4)

Euglena → Longitudinal binary fission.

Amoeba → Simple binary fission.

Hydra → Exogenous budding and fragmentation.

11. The mode of asexual reproduction in *Euglena* is
- (1) Transverse binary fission (2) Irregular binary fission
(3) Multiple fission (4) Longitudinal binary fission

Sol. Answer (4)

In longitudinal binary fission, plane of fission passes along longitudinal axis of animal.

12. Animals which possess cleidoic eggs exhibit
- (1) External fertilization and internal development
(2) Internal fertilization and internal development
(3) Internal fertilization and external development
(4) External fertilization and external development

Sol. Answer (3)

Example → Reptiles and birds.

13. Regarding fertilization which among the following statements is **incorrect**?
- (1) It restores diploid condition in the zygote
(2) It activates egg both physiologically and metabolically
(3) Paternal and maternal sets contribute to the diploid number without causing any variation
(4) It determines the sex of the offspring

Sol. Answer (3)

Variations are caused in sexual reproduction, upon fertilization occurs.

14. Which is connected to asexual reproduction?
- (1) Gemmules (2) Gametes (3) Gonads (4) Genitalia

Sol. Answer (1)

15. Why is asexual reproduction sometimes disadvantageous?
- (1) It allows sedentary animals to produce offspring without mates
(2) It allows animals to produce many offspring quickly
(3) It saves time and energy of gamete formation
(4) It produces genetically uniform population

Sol. Answer (4)

There is no significant variation.

SECTION - C

Assertion-Reason Type Questions

1. A : Maximum life span is the characteristic of a population.
R : It is the maximum time period upto which a population has survived.

Sol. Answer (4)

Maximum life span is the characteristic of a species. It is the maximum age reached by any member of a species.
Life expectancy is the characteristic of a population.

2. A : Reproduction is means of self perpetuation of a race.
R : It introduces variations essential for adaptability and struggle for existence.

Sol. Answer (2)

Variations are necessary so that some individuals of the species showing beneficial variations can survive in extreme environments and there is no extinction of species.

3. A : Asexual reproduction is a rapid mode of reproduction.
R : It plays an important role in evolution.

Sol. Answer (3)

Asexual reproduction is rapid but does not play important role in evolution because there are no significant variations.

4. A : Animals are either unisexual or bisexual.
R : Most of the bisexual animals reproduce by cross-fertilization.

Sol. Answer (2)

Cross-fertilization may be due to protandrous (maturation of male gonads first) or protogynous (maturation of female gonads first) conditions. These both prevent self-fertilization.

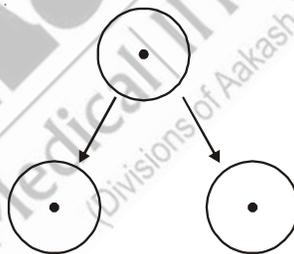
5. A : Development of embryo from the zygote is known as embryogenesis.
R : Embryogenesis involves cell division and cell differentiation.

Sol. Answer (2)

6. A : The term 'limited life span' cannot be associated with many unicellular organism.
R : The unicellular organisms divide as soon as they get mature and continue to live as two or more daughter organisms.

Sol. Answer (1)

The single-celled organisms divided into two daughter cells. This division will continue. Hence, unicellular organisms are said to be immortal.



7. A : Life expectancy is based on average life span.
R : It is the age at which half the population still survives.

Sol. Answer (2)

Life expectancy refers to the number of years an individual can expect to live in a population.

8. A : Complete parthenogenesis is also called obligatory parthenogenesis.
R : It occurs in animals which breed exclusively by this method.

Sol. Answer (1)

It is obligatory because they reproduce only by parthenogenesis .

9. A : Meiocyte is the gamete mother cell.

R : Meiocyte is always haploid.

Sol. Answer (3)

Meiocytes → Specialized cells in diploid organisms.

→ Undergo meiosis

→ Gametes mother cells

→ Hence diploid

10. A : The unicellular zygote develops into a multicellular embryo during embryogenesis.

R : Organogenesis forms an important part of the process of embryogenesis.

Sol. Answer (2)

Organogenesis refers to formation of organs.

11. A : Sex pheromones are volatile substances that are released by animals to attract their partners.

R : Bombykol is a sex pheromone released by the male *Bombyx mori* to attract the female.

Sol. Answer (3)

Bombykol is released by female *Bombyx mori*.

12. A : The ovoviviparous organisms give birth to young ones.

R : The eggs are incubated within the uterus and receive nourishment from the placenta during development.

Sol. Answer (3)

There is no placenta formation in ovoviviparous organisms.

13. A : The single-celled organisms are immortal.

R : Cell division is a mode of reproduction in single-celled organisms.

Sol. Answer (1)

14. A : External syngamy is considered disadvantageous as compared to the internal syngamy.

R : The offspring produced by external syngamy are more vulnerable to predators.

Sol. Answer (1)

External fertilization results in formation of organism outside the body of its parent, hence it is more prone to predation.

15. A : The number of male gametes produced is always greater than the number of female gametes produced.

R : A large number of male gametes fail to reach the female gamete.

Sol. Answer (1)

Large number to male gametes are produced to enhance the chances of successful syngamy.

