Organisms & Its Environment

1 Mark Questions

1.Give an example of an organism that enters 'diapause' and why?[Delhi 2014]
Ans.Many zooplanktons in lakes and ponds enter diapause. They enter diapause to escape unfavourable environmental conditions and to delay the overall development.

2.Mention how do bears escape from stressful time in winter. [Delhi 2013c]
Ans. Bears escape from stressful time in winter by going into hibernation

3.Write the basis on which an organism occupies a space in its community/natural surroundings.[All India 2013]
Ans. An organism occupies individual or species level in its community. This level is occupied on the basis of ecological level of organisation or ecological hierarchy. Individual-> Population -> Biotic community -> Biome

4.Why are some organisms called as eurythermals and some other as stenohaline? [Foreign 2011]
Ans.Organisms, which can tolerate and thrive in a wide range of temperatures are called as eurythermal while organisms, which can tolerate and thrive in a narrow range of salinities are stenohaline

5.Why are green plants not found beyond a certain depth in the ocean? [HOTS; Delhi 2011]
Ans.Beyond a certain depth, green plants are not found, because light is unavailable in that zone.

6.Mention any two activities of animals, which get cues from diurnal and seasonal variations in light intensity, [Delhi 2011 c]
Ans.The two activities of animals which get cues from diurnal and seasonal variations in light intensity are:
(i) Timing their foraging
(ii) Migratory activities
(iii) Reproduction (any two)

7.How do animals like fishs and snails avoid summer related unfavourable conditions? [Delhi 2010]
Ans. Fish migrate and snails go into aestivation or summer sleep to avoid summer-related problems.

8.How do prickles help cactus survive in desert? Give two methods.[All India 2010 C]
Ans.The two methods by which prickles help cactus survive in desert are:
(i) By reducing and altering outer surface to reduce evaporation of water.
(ii) By providing defense against grazing animals.

9.Which one of the two, stenothermals or eurythermals shows wide range of distribution on earth and why?[HOTS; Delhi 2008]

Ans.Eurythermals show a wide range of distribution on earth, as they can tolerate and thrive in a wide range of temperatures

10.When and why do some animals like snails go into aestivation?[All India 2008]

Ans. During stressful conditions of the habitat and inability to migrate, animals like snails undergo aestivation and protect themselves

11.Why is the polar region not a suitable habitat for tiny humming birds? [HOTS; All India 2008]

Ans. Humming birds have a larger surface area compared to body volume. They tend to lose body heat very fast, when it is cold outside. Due to this, they need to spend more energy to generate body heat. Hence, polar region being a cold habitat is not suitable for tiny hummingbirds

12.When and why do some animals go into hibernation? [Foreign 2008]

Ans. When unfavourable conditions are for a short time and if the animals could not migrate, they undergo hibernation to avoid stressful winter conditions.

13.List any two physiological responses that help you to gradually get acclimatised to high altitudes when you go from the plains. [Delhi 2008 C]

Ans.The physiological condition or responses in order to get accl imatised to high attitudes are:

(i) To compensate low oxygen, the production of red blood cells is increased.

(ii) High haemoglobin content and its decreased binding capacity.

(iii) Faster breathing rate (any two).

14.Define homeostasis. [All India 2008 C]

Ans. The process to maintain the constancy of internal environment of the body, despite varying external environmental conditions is called homeostasis

15.When and why do some animals like frogs hibernate? [Delhi 2008]

Ans. When unfavourable conditions are for a short time period and animals are unable to migrate, they hibernate to avoid the stres winter.

16.Between amphibians and birds, which will be stable to cope with global warming? Give reason.[HOTS; All India 2008]

Ans.Birds will be stable to cope with global warming because they can tolerate a wide range of temperatures (eurythermals).

17.How do herbs and shrubs survive under the shadow of big canopied trees in forests? [Delhi 2008C]

Ans. The herbs and shrubs are adapted to perform photosynthesis optimally under very low light conditions due to growing in the forests under the shadow' of big canopied trees

18.Why many of the freshwater animals cannot live for long in seawater or vice versa?[HOTS; Delhi; All India 2008 C]

Ans.Seawater contains high quantity of salt that is not favourable for freshwater animals. They face osmotic problems, hence they cannot survive in seawater for long.

2 Marks Questions

19.Some organisms suspend their metabolic activities to survive in unfavourable condition. Explain with the help of any four examples.[Delhi 2012]

Ans. Examples of organisms that suspend their metabolic activities in unfavourable condition.
(i) Bacteria, fungi and lower plants They form thick-walled spores, which help them to survive in unfavourable conditions. Spores germinate on return of favourable conditions.
(ii) Higher plants Seeds and some other vegetative reproductive structures serve as means to tide over periods of stress. They reduce their metabolic activity and undergo dormancy.
(iii) Animals They undergo hibernation or aestivation, if unable to migrate. For example, some snails and fishes.
(iv) Zooplanktons They enter diapause (suspended development) under unfavourable conditions.

20.Explain the response of all communities to environment over time. [All India 2011]

Ans.Response of communities to environment:
(i) Some organisms maintain homeostasis by physiological or behavioural means (regulate).

(ii)The internal environment in majority of animals and nearly all plants change with the change of external environment (conform).
(iii)Some organisms leave their habitats temporarily during unfavourable conditions and return back when conditions become favourable (migrate).
(iv)Some organisms suspend their metabolic activities to avoid stress by timely escaping, e.g. hibernation and aestivation.

21.Bear hibernates, whereas some species of zooplanktons enter diapause to avoid stressful external conditions. How are these two ways different from each other?[Foreign 2011]
Ans.Difference between diapause and hibernation:

Diapause	Hibernation
State of suspended development during unfavourable condition.	Process of spending winter's extreme cold conditions in a dormant state.
e.g. zooplanktons.	e.g. some animals like bear.

22.How does our body adapt to low oxygen availability at high altitudes?[Foreign 2011]
Ans. Body adaptations at high altitudes are:
The physiological condition or responses in order to get accl imatised to high attitudes are:
(i) To compensate low oxygen, the production of red blood cells is increased.
(ii) High haemoglobin content and its decreased binding capacity.
(iii) Faster breathing rate (any two).

23.Why are small animals rarely found in the polar regions? Explain.[HOTS; Foreign 2010]
Ans.Small animals have a large surface area relative to their volume. So, they tend to lose body heat very fast during cold conditions. They need to spend more energy to generate body heat. Due to this smaller animals are rarely found in polar regions.

24.How do seals adapt to their natural habitat? Explain. [Foreign 2010]
Ans.Seals adapt to the natural habitat (cold climate) by developing a thick layer of fat (blubber) below their skin that acts as an insulator and reduce excess loss of body heat.

25.Humming birds ,, live among the bushes in tropics, while penguins live on icebergs. They cannot survive if their habitats are reversed. Justify. [HOTS; Delhi 2010 C]
Ans.Humming birds are natural habitats of tropics. They have large surface area relative to their volume. So, they tend to lose heat very fast, even when it is cold outside.Penguins live on icebergs (natural habitat). They have less surface area to volume ratio. The lesser the ratio, more effective will be the thermoregulation. Also, they hide in group to escape from cold conditions. Therefore, both of them will not survive if their habitats are reversed

26.How does human body maintain constant temperature both in summers and winters? Explain.[Delhi 2009 C]
Ans.Human body maintains constant body temperature (37°C) as follows:
In summers, the outside temperature is very high than our body temperature. Due to this, profuse sweating occurs. This causes evaporation and cooling effect on the body.
In winters, the outside temperature is much lower than our body temperature. This causes shivering, a kind of exercise that produces heat and raises the body temperature.

3 Marks Questions

27.(i)State how the constant internal environment is beneficial to organisms.

(ii)Explain any two alternatives by which orgnaisms can overcome stressful external conditions.[All India 2014]

Ans.(i)Constant internal environment is beneficial to organisms as it permits all biochemical reactions and physiological functions to proceed with maximal efficiency, thereby enhancing the overall efficiency of organism.

(ii) The two alternatives by which organisms can overcome stressful external conditions are

- Migration-organisms move temporarily to a favourable area under stressful conditions and return back when the period is over.
- Hibernation and aestivation are ways to escape the stress during winters and summers respectively.

28.Water is very essential for life. Write any three features both for plants and animals which enable them to survive in water scarce environment,

or

How do organisms cope with stressful external environmental conditions which are localised or of short duration? [ah India 2011]

Ans.Adaptation in plants

(i) Thick cuticle on their leaf surface.

(ii) Stomata are arranged in deep pits (sunken) to minimise water loss through transpiration.

(iii) Leaves are reduced to spines. The photosynthetic function is carried out by thick, fleshy flattened stems.

Adaptation in animals

(i) Kangaroo rat meets the water requirement through internal oxidation of fat. They concentrate their urine, so that minimum volume of water is excreted.

(ii) Snails undergo aestivation during summers.

Organisms either migrate or suspend their metabolic activities when conditions are stressful for short duration.In such conditions, organisms are as follow:

(i) Moving away from stressful habitat to more favourable area and return to their habitat when stressful period is over. For example, birds from Siberia and other cold countries migrate to Bharatpur Sanctuary of Rajasthan.

(ii) Hibernating (frogs) or aestivating (snails) or undergo diapause (zooplanktons).

(iii) Thick-walled spores are formed in stressful conditions and germinate under suitable conditions, e.g. bacteria, fungi and lower groups of plants.

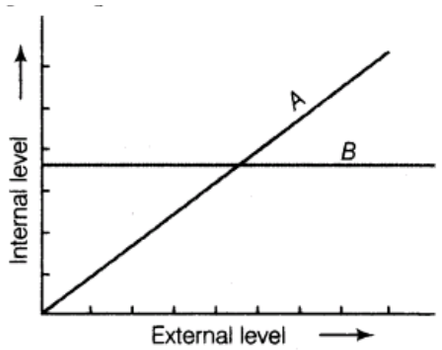
29.How do organisms like fungi, zooplanktons and bears overcome the temporary short-lived climatic stressful conditions? Explain.[All India 2010; Delhi 2008]

Ans.(i)Fungi They produce various kinds of thick-walled spores to survive under unfavourable conditions, which germinate on return of favourable conditions.

(ii) Zooplanktons They enter diapause, a stage of suspended development under unfavourable conditions.

(iii)Bears They hibernate during winter to escape the time of unfavourable conditions.

30.The following graph represents the organismic response to certain environmental condition (e.g. temperature)



(i)Which one of these A or B depicts conformers?
(ii)What does the other line graph depict?
(iii)How do these organisms differ from each other with reference to homeostasis?
(iv)Mention the category to which human belong. [All India 2009]
Ans.(i)A depicts conformers.
(ii) The other line B depicts regulators.
(iii) Differences between conformer and regulator are:

Conformer	Regulator
These cannot maintain a constant internal environment and change according to the ambient atmospheric conditions.	These organisms maintain a constant internal environment despite changes in the environment.
They show a narrow range of distribution.	They show a much wider range of distribution.

(iv) Humans are regulators.

5 Marks Questions

31.(i) Explain giving reasons why the tourists visiting Rohtang Pass or Mansarovar are advised to resume normal active life only after a few days of reaching there.
(ii) It is impossible to find small animals in the polar regions. Give reasons. [All India 2012]
Ans.(i)Tourists visiting to Rohtang Pass near Manali (> 3500 m) may suffer from altitude sickness. They resume normal active life only after a week because in low atmospheric pressure at high altitudes, the body does not get enough oxygen. Gradually, the body compensates low oxygen availability by
(a)Increasing red blood cell production.
(b)Decreasing the binding affinity of haemoglobin.
(c)Increasing the breathing rate.
(ii)Small animals have a large surface area relative to their volume. So, they tend to lose body heat very fast during cold conditions. They need to spend more energy to generate body heat. Due to this smaller animals are rarely found in polar regions.

32.list the different ways by which organisms cope or manage with abiotic stresses in nature. Explain any three ways. [All India 2009c]
Ans.Organisms cope up with abiotic stress by:
(i)Regulating Some organisms maintain homeostasis by physiological and behavioural means. They are called regulators, e.g.

- In summers, when outside temperature is more, we sweat profusely that results in evaporative cooling to bring down the body temperature.
- In winters, when temperature is low, we shiver (a kind of exercise) that produces heat

and raise the body temperature.

(ii) Conformating Organisms that cannot maintain a constant internal environment. Their body temperature changes with the ambient temperature. Such animals are called conformers. For example, small animals have larger surface area relative to their volume. They lose body heat very fast in low temperature. So, they expend energy to generate body heat through metabolism for adjusting.
(iii) Migrating The temporary movement of organisms from the stressful habitat to a more hospitable area and return when favourable conditions reappear is called migration. The long distance migration is very common in birds.

33.(i) List any four abiotic components that lead to variations in the physical and chemical conditions of habitats.
(ii) Explain the impact of these components on the distribution of organisms in different habitats.
[All India 2009 C]
Ans.(i)Temperature, water, light and soil.
(ii) (a) Temperature influences the kinetics of enzymes and thereby the metabolism and other physiological functions of the organisms.
Organisms may be eurythermal and can tolerate a wide range of temperature and stenothermal that can tolerate only a narrow range of temperature.
(b)Water is important to sustain life and productivity and distribution of plants is dependent on water.
Freshwater forms cannot thrive in sea water and vice versa.
(c)Light influences photosynthesis of plants. Light also influences the flowering in plants and timing of foraging, reproduction and migratory activities of animals.
Aquatic plants occupy different depths depending on their pigments and the light available.
(d)Soil influences vegetation by the water holding capacity, topography and its composition.