



# DOON ACADEMY OF DEFENCE (D.A.D.)

## MNS-2020 (Biology Questions)

(Note : These questions are memory based. The actual question in exam may vary)

- 1. Parthenogenesis** [Shift 1]  
Parthenogenesis is a form of asexual reproduction in which an unfertilized egg develops into a new individual. It is a method in which a new individual developed without fertilization. Here male do not have any role to play and only female gametes develop into new offspring. For eg: honey bees , ants , birds etc
- 2. Growth increase in plant by** [Shift 1]  
Growth in plants occurs as the stems and roots lengthen. Some plants, especially those that are woody, also increase in thickness during their life span. The increase in length of the shoot and the root is referred to as primary growth, and is the result of cell division in the shoot apical meristem. Secondary growth is characterized by an increase in thickness or girth of the plant, and is caused by cell division in the lateral meristem.
- 3. Bacteriophage** [Shift 1]  
Bacteriophage, also called phage or bacterial virus, any of a group of viruses that infect bacteria. Thousands of varieties of phages exist, each of which may infect only one type or a few types of bacteria or archaea. Phages are classified in a number of virus families; some examples include Inoviridae, Microviridae, Rudiviridae, and Tectiviridae.
- 4. In which phase of cell cycle , DNA synthesis** [Shift 1]  
S phase (Synthesis Phase) is the phase of the cell cycle in which DNA is replicated, occurring between G1 phase and G2 phase. Since accurate duplication of the genome is critical to successful cell division, the processes that occur during S-phase are tightly regulated and widely conserved.
- 5. Bones in cervical, thoracic, lumbar, sacral, and coccygeal respectively?** [Shift 1]  
In humans, the vertebral column usually consists of 33 vertebrae, placed in series and connected by ligaments and intervertebral discs. However, the number of vertebrae can vary between 32 and 35. Usually there are 7 cervical, 12 thoracic, 5 lumbar, 5 sacral and 4 caudal (coccygeal) vertebrae.
- 6. DOTS is for treatment of?** [Shift 1]  
Tuberculosis
- 7. Blood clotting is prevented in blood by which factor** [Shift 1]  
Heparin is an anticoagulant (blood thinner) that prevents the formation of blood clots. Heparin is used to treat and prevent blood clots caused by certain medical conditions or medical procedures. It is also used before surgery to reduce the risk of blood clots.
- 8. Accessory gland which found only in mamalian man** [Shift 1]  
Cowper's gland or bulbourethral gland are the accessory paired gland. They are part of the male reproductive system and are of pea size. They contribute to about 0.1 to 0.2 % of the ejaculation as they secrete clear white fluid rich in mucoproteins and therefore perform the accessory function of protecting and preserving the sperm.

- 9. Jute fibre is obtain from?** [Shift 1]  
Phloem vessel. The jute fiber comes from the stem and ribbon (outer skin) of the jute plant. The fibers are first extracted by retting. The retting process consists of bundling jute stems together and immersing them in slow running water.
- 10. How many heart chambers in cockroach ?** [Shift 2]  
Cockroaches are pests inhabiting the unhygienic and damp places. They are dark brown in colour belonging to the phylum Arthropoda, the Blattidae family, and class Insecta. A cockroach has a tubular heart which is 13 chambered. Oxygenated blood reaches each chamber through a pair of slits openings known as Ostia.
- 11. What does it mean if the BOD of a water body is less than 5ppm?** [Shift 2]  
The amount of oxygen required by bacteria to breakdown the organic matter present in a certain volume of a sample of water, is called Biochemical Oxygen Demand (BOD). If BOD of water is less than 5 ppm, it is clean. If BOD increases, water pollution increases.
- 12. Longest phase of cell cycle?** [Shift 2]  
Interphase is the longest part of the cell cycle. This is when the cell grows and copies its DNA before moving into mitosis. During mitosis, chromosomes will align, separate, and move into new daughter cells. The prefix *inter-* means between, so interphase takes place between one mitotic (M) phase and the next.
- 13. Types of bond in nucleotides?** [Shift 2]  
The type of bond that holds the phosphate group to the sugar in DNA's backbone is called a phosphodiester bond. Hydrogen bonds connect bases to one another and glycosidic bonds occur between deoxyribose groups and the base groups.
- 14. Method use to separate DNA fragments** [Shift 2]  
A technique used to separate DNA fragments according to their size is called gel electrophoresis where DNA samples are loaded into wells (indentations) at one end of a gel, then to pull them an electric current is applied through the gel.
- 15. Which of the animal cell has cell wall?** [Shift 2]  
Animal cell do not have cell wall
- 16. Which hormone is responsible for senescence in leaves.** [Shift 2]  
Senescence is an active genetically controlled developmental process in which cellular structure and macromolecules are broken down and translocated away from the senescing organ (typical leaves) to actively growing region that serve as nutrient sinks. Senescence is initiated by environmental cues and is regulated by the hormones, e.g. ABA (Abscisic Acid) Higher amount of ABA stops protein and RNA synthesis thus accelerating the senescence.
- 17. Hormone which make plant grow towards Sunlight.** [Shift 2]  
The bending of plant towards light is known as phototropism. It is due to plant hormone auxins. When the growing parts of a phototropic plant detect sunlight, auxins (synthesized at the shoot tips) help the cells grow longer. When light falls on one side of the plant, the auxins generally diffuse towards the shaded side of the shoot. This stimulates the cells in the shaded area to grow longer than the corresponding cells of the illuminated region. This results in the curvature of the plant stem tip towards the light.
- 18. Basidiomycetes** [Shift 2]  
Members of the division Basidiomycetes are known as club fungi. They include the common mushroom, the shelf fungi, puffballs, and other fleshy fungi. Sexual spores called basidiospores are formed on clublike structures called basidia (the singular is basidium).

- 19.ETS** [Shift 2]  
The electron transport system occurs in the cristae of the mitochondria, where a series of cytochromes (enzymes) and coenzymes exist. These cytochromes and coenzymes act as carrier molecules and transfer molecules. They accept high-energy electrons and pass the electrons to the next molecule in the system. At key proton-pumping sites, the energy of the electrons transports protons across the membrane into the outer compartment of the mitochondrion
- 20. One organism is benefitted and other has no effect** [Shift 2]  
Parasitism is the relationship where one organism is benefitted at the expense of other. Commensalism refers to the relationship wherein one organism is benefitted while other remain unaffected.
- 21. Most abundant antibody** [Shift 2]  
IgG is the most abundant circulating antibody, making up 80% of the total antibodies and 75% of that found in serum. IgG provides the majority of antibody-based immunity against pathogens. IgG can be split into 4 sub-isotypes, each with its own effector function.
- 22. Leaves Fall Water on dry day because** [Shift 2]  
On a hot, dry day , transpiration causes more water to be lost than is coming in, and the water balance within the plant can get thrown off. The dehydrated collapsing cells in the leaves and stems can no longer remain erect, and the plant begins to wilt.
- 23. Immunity** [Shift 2]  
Immunity refers to the body's ability to prevent the invasion of pathogens. Pathogens are foreign disease-causing substances, such as bacteria and viruses, and people are exposed to them every day. Antigens are attached to the surface of pathogens and stimulate an immune response in the body. An immune response is the body's defense system to fight against antigens and protect the body.
- 24. A cell which can generate a whole new plant is called** [Shift 2]  
The capacity to generate a whole plant from any cell/ explant is called totipotency.
- 25. Flowers which are sessile are found in** [Shift 2]  
Sessile flowers are those flowers which do not have a pedicel. They may be found solitary or in an inflorescence. Spike and spadix inflorescences have sessile flowers. Some common examples of sessile flowers found in India are Achyranthes, saffron etc.
- 26. Aquatic plants transport water through** [Shift 2]  
Transpiration is absent in truly submerged plants, but the presence of guttation verifies that long-distance water transport takes place. Use of tritiated water showed that the water current arises from the roots, and the main flow of water is channeled to the youngest leaves.
- 27. The movement of food in phloem is** [Shift 2]  
The transport of food in plants is called translocation. It takes place with the help of a conducting tissue called phloem. Phloem transports glucose, amino acids and other substances from leaves to root, shoot, fruits and seeds. Sieve tube and companion cells help in transporting the food in upward and downward directions
- 28. Larvae of cockroach is called.** [Shift 2]  
Nymph. Cockroaches develop through a process called gradual metamorphosis. In this process, the immature roaches look almost like the mature roaches. This process has three stages: egg, nymph, and adult.

**29. Secondary sexual character hormone [Shift 2]**

Estrogens are hormones that are important for sexual and reproductive development, mainly in women. They are also referred to as female sex hormones. The term "estrogen" refers to all of the chemically similar hormones in this group, which are estrone, estradiol (primary in women of reproductive age) and estriol. It is responsible for the development of secondary sexual characteristics, that is, growth and development of the breasts and reproductive organs, fat redistribution (hips, breasts), and bone maturation.

**30. Plants which can tolerate narrow range of salinity [Shift 2]**

A halophyte is a salt-tolerant plant that grows in soil or waters of high salinity, coming into contact with saline water through its roots or by salt spray, such as in saline semi-deserts, mangrove swamps, marshes and sloughs and seashores.

**31. Plants breathe through \_\_\_\_\_ in old trees crevices. [Shift 2]**

A lenticel is a porous tissue consisting of cells with large intercellular spaces in the periderm of the secondarily thickened organs and the bark of woody stems and roots of dicotyledonous flowering plants. It functions as a pore, providing a pathway for the direct exchange of gases between the internal tissues and atmosphere through the bark, which is otherwise impermeable to gases.

**32. Snake plant belongs to [Shift 2]**

Snake plants, also referred to as mother-in-law's tongue, are native to rocky, dry habitats in tropical Africa. The plants most in household cultivation are *Sansiveria trifasciata* and its cultivars and *Sansiveria cylindrica*, both of which are stiff, erect plants. It is an evergreen perennial plant forming dense stands.

**33. Lateral roots arise from which part? [Shift 3]**

Lateral roots is an extension of primary root which starts to develop in the pericycle, which is the outermost cell layer in the vascular cylinder.

**34. Which of the following have bone marrow?? [Shift 3]**

Bone marrow is found in the center of most bones and has many blood vessels. There are two types of bone marrow: red and yellow. Red marrow contains blood stem cells that can become red blood cells, white blood cells, or platelets. In adults, the highest concentration of red marrow is in the bones of the vertebrae, hips (ilium), breastbone (sternum), ribs, skull and at the metaphyseal and epiphyseal ends of the long bones of the arm (humerus) and leg (femur and tibia).

**35. Study of humans under which phylum? [Shift 3]**

Chordata

**36. Silk formed by silk worm on which stage [Shift 3]**

The life cycle of silk moth starts when a female silk moth lays eggs. The caterpillar or larvae are hatched from the eggs of the silk moth. The silkworms feed on mulberry leaves and give rise to pupa. In the pupa stage, a weave is netted around by the silkworm to hold itself. After that it swings its head, spinning a fibre made of a protein and becomes a silk fibre. Several caterpillars form a protective layer around pupa and this covering is known as the cocoon. The silk thread (yarn) is obtained from the silk moth's cocoon.

**37. Catalytic property shown by which type of RNA during translocation. [Shift 3]**

Ribozymes are RNA molecules that act as chemical catalysts. In contemporary cells, most known ribozymes carry out phosphoryl transfer reactions.

**38. Aerobic respiration [Shift 3]**

Aerobic respiration is a biological process in which food glucose is converted into energy in the presence of oxygen. Aerobic respiration is defined as a catabolic pathway that uses the molecule oxygen.

**39. Vertical distribution of species called as**

**[Shift 3]**

The vertical distribution of various species that occupy different levels in a biotic community is known as Stratification. For example, trees occupy top vertical strata or layer of a forest, shrubs the second and herbs and grasses occupy the bottom layers.

**40. Bryophytes plant differ from other plant in**

They do not have vascular bundle.

**41. Before life established on earth, its nature was reducing, name the organism which turned earth's nature oxidizing**

Cyanobacteria are aquatic and photosynthetic, that is, they live in the water, and can manufacture their own food. Because they are bacteria, they are quite small and usually unicellular, though they often grow in colonies large enough to see. They are believed to be one of the oldest organisms on Earth with fossil records dating back 3.5 billion years. Cyanobacteria are responsible for the Earth's transition from a carbon dioxide-rich atmosphere to the present relatively oxygen-rich atmosphere as a consequence of oxygenic photosynthesis.

**42. In some plants leaves are modified into?**

- **Leaf tendril to provide support:** in many climbers, the leaf is modified into a thin-thread like coiled structure called tendril. A tendril stretches out and twines around a suitable object to provide support to the weak stems.
- **Leaf spines to provide protection and reduce the loss of water:** In certain plants, leaves or parts of leaves get modified into pointed structures called spines. Spines help to reduce the loss of water by transpiration. They also protect the plant from grazing animals. Example spines on cactus.
- **Scale leaves to protect buds and store food and water:** in some plants, the leaves are modified into scale leaves and perform the function of protecting the buds. They also store food and water.

**43. Photoperiodism is because of which hormone?**

Florigen. It is produced in the leaves, and acts in the shoot apical meristem of buds and growing tips. It is known to be graft-transmissible, and even functions between species.

**44. Hormone responsible for accessory development in females?**

Estrogens are the primary female sex hormones. They promote the development of female accessory/secondary sexual characteristics such as breasts and are also involved in the thickening of the endometrium and other aspects of regulating the menstrual cycle.

**45. Aquaculture related to?**

Aquaculture is the controlled process of cultivating aquatic organisms, especially for human consumption. It's a similar concept to agriculture, but with fish instead of plants or livestock. Aquaculture is also referred to as fish farming.

**46. What happens in Balbiani rings?**

Balbiani rings (puffs) are site of RNA and protein synthesis. These chromosomes show distinct dark and light bands. Euchromatin is present in dark bands and heterochromatin is present in light bands. These bands helps in mapping of chromosomes in cytogenetic studies. These chromosomes form puffs or loops (in region of dark bands) which are called Balbiani puffs or Balbiani rings where synthesis of wRNA occurs.

**47. Oasis related to?**

It is a place in the desert where there is water and where plants grow.

**48. Chemical theory of origin of species given by?**

Haldane and Oparin

**49. Rhabditiform larva**

Rhabditiform larva is characteristic to nematodes (roundworm). Splitting of egg shells of intestinal parasite *Ascaris* (roundworm) release rhabditiform larvae in the intestine from where they reach to the liver via portal circulation and to the heart via pulmonary circulation then finally to lungs where they moult.



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