ROLL NO.	
NAME	
CLASS & SECTION	

APEEJAY COMMON ANNUAL EXAMINATION, 2019-20 **09**

CLASS-XII

BIOLOGY (044)

Time allowed : 3 hrs. ***Maximum Marks : 70***

General Instructions :

1. ***There are a total of 27 questions and five sections in the question paper. All questions are compulsory.***
2. ***Section A contains question number 1 to 5, objective type questions of one mark each.***
3. ***Section B contains question number 6 to 12, Short Answer type I questions of two marks each.***
4. ***Section C contains question number 13 to 21, Short Answer type II questions of three marks each.***
5. ***Section D contains question number 22 to 24, case -based Short Answer type II questions of three marks each.***
6. ***Section E contains question number 25 to 27, Long Answer type questions of five marks each.***
7. ***There is no overall choice in the question paper; however, internal choices are provided in two questions of one mark, one question of two marks, two questions of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given options in the question paper with the same question number.***

SECTION–A

1. Higher energy level and shorter wavelength are features of (1)

(a) beta radiation (b) alpha radiation

(c) ultraviolet radiation (d) infrared radiation

OR

Which of the following area in India has the largest number of endemic plant species?

(a) Himalayan region (b) Malabar region

(c) Gangetic plains (d) Western Ghats

P.T.O.

14. (a) Name the selectable markers in the cloning vector pBR322? Mention the role they play. (3)

(b) Why is the coding sequence of an enzyme (β-galactosidase), a preferred selectable marker in comparison to the ones named above?

15. Continued self-pollination results in inbreeding depression. What are the out breeding devices developed in flowering plants to discourage self-pollination? Which type of pollination is seen in Papaya? (3)

16. Evolution is the change of gene frequencies in a population in response to changes in environment in the time scale of years and not centuries? Justify the statement with reference to DDT. How does the theory of Hugo de varies support this? (3)

OR

Explain convergent and divergent evolution with the help of one example each.

17. (a) How Oswald Avery, Colin Macleod and Maclyn MC Carty, while determining the biochemical nature of transforming principle in the Griffith's experiment proved that DNA is the heredity material? (3)

(b) How is the transforming principle explained by this experiment?

18. How does primary sludge differ from activated sludge? What changes the sludge undergo in an anaerobic sludge digester? (3)

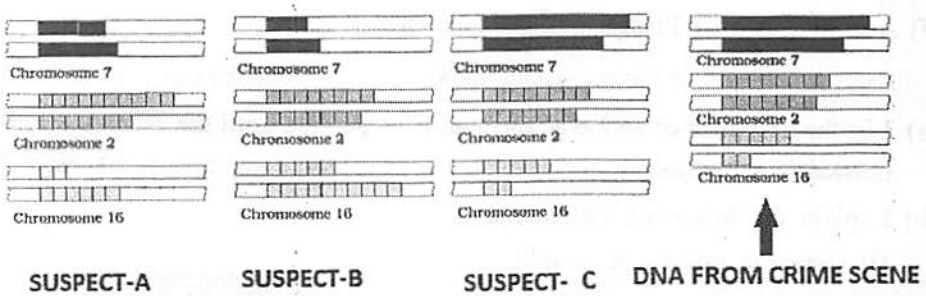
19. (a) How are the following animals adapted to their habitat : (3)

(i) whales (ii) kangaroo rat

(iii) polar bear (iv) Desert lizard.

(b) Why do cold regions not have small animals?

20. Tissue samples were collected from the victim's body as evidence from the crime scene and tissue samples from the suspects A, B and C were also collected by the forensic experts to find out the culprit. The results of DNA fingerprinting obtained are as follows : (3)



(a) Who according to the above DNA fingerprinting results is the culprit? And how was it possible to come to a conclusion, by the forensic experts.

(b) What forms the basis of DNA fingerprinting? Explain.

21. A vector is engineered with three features which facilitates its cloning within the host cell. List the three features and explain each one of them. (3)

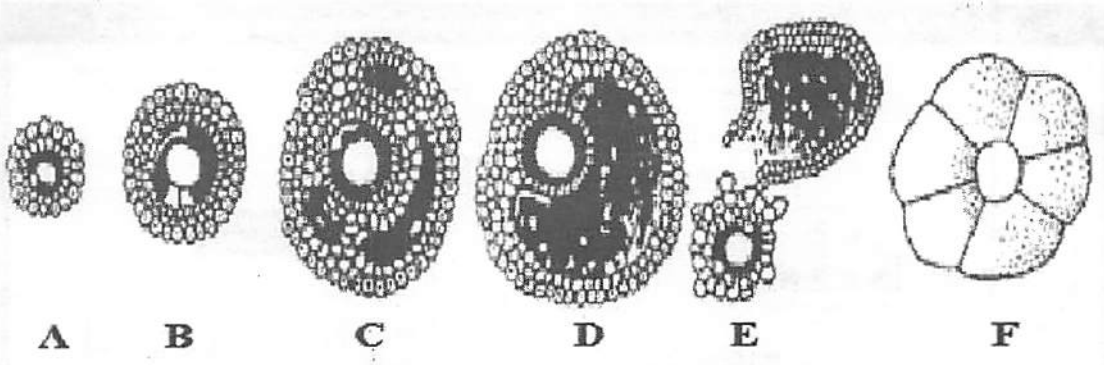
SECTION-D

22. Study the pictographic depiction which shows the development and maturation of ovarian follicle and answer the following questions : (3)

(a) Name the structure formed in the stage 'F'.

(b) Identify the stage in which ovulation occurs.

(c) Identify the stage 'B' and 'D' and distinguish between them.



23. When new and aggressive specie is introduced into an ecosystem, in absence of natural predators or controls, it breeds and spreads quickly, taking over an area. Native wildlife may not have evolved defenses against the new species, or they may not be able to compete with the species that has no natural predators in the food chain. (3)

There are direct as well as indirect threats created by such species. Such species can also modify the bio diversity of species in the native wildlife habitat.

Introduction of Lantana camara in India, whose Nativity is Trop. America was an invasive plant

(a) Why exotic species do not have predators?

(b) What could be the possible reasons for the reduction in the population of Native species?

(c) What had happened when

(i) Nile perch was introduced in Lake Victoria

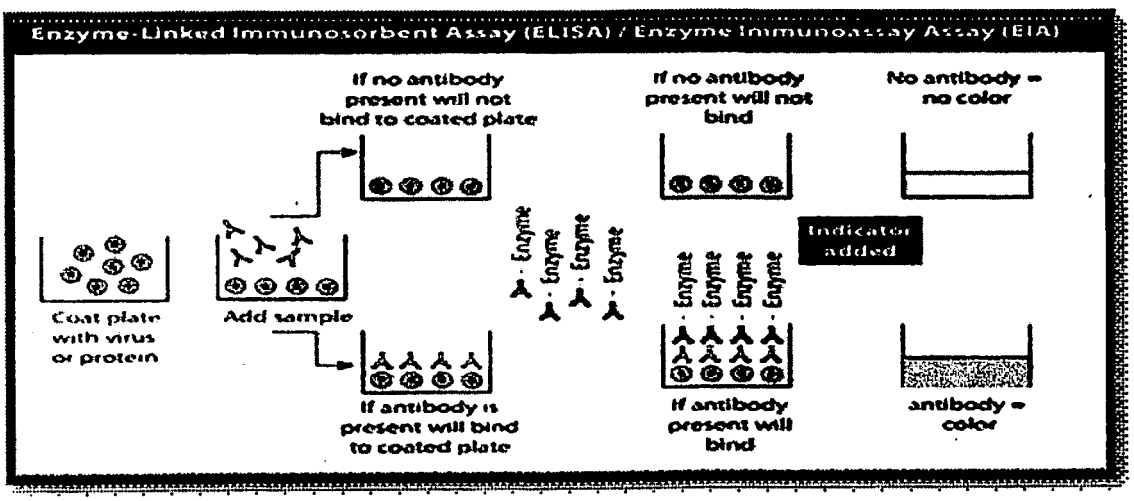
(ii) The African catfish was introduced in the inland water bodies.

24. ELISA is an abbreviation for "enzyme-linked immunosorbent assay." In 1974, P. Perlmann and E. Engvall developed the test as a substitute for certain radioimmunoassay tests. It uses components of the immune system (such as IgG or IgM antibodies) and chemicals for the detection of immune responses in the body to infectious microbes. (3)

The ELISA test involves

- An enzyme
- An antibody or antigen that may form an antigen-antibody reaction to confirm the test.

The test is based on a micro titer plate that has a solid phase substrate (target protein, antigen) at a known concentration fixed to the plate that when exposed to an antibody that has an indicator attached (dye for color change or enzyme-labeled antibody) that can produce a color change.



Medical professionals frequently use ELISA tests to detect antigens that may be present in the blood. The substances detected by ELISA tests can include hormones, allergens, viral and bacterial antigens and antibodies. They can also identify an infectious disease agent in patients.

(a) What is a primary antibody?

(i) the second antibody used to detect foreign particle

(ii) particle produced by the antigen

(iii) the first antibody used to detect foreign particle

(iv) second cell produced by the macrophage

(b) What is another name for antibodies?

(i) helper to cells (ii) hemoglobin

(iii) immunoglynocists (iv) immunoglobulins

(c) During an immune response, which of the following is the first cell responder to attack a pathogen's antigen? What happens later to it?

(i) B cell (ii) T cell

(iii) macrophage (iv) leukocyte

(d) Why the colour change in ELISA test is observed only in case of infected samples?

SECTION-E

25. (a) Explain the observations of Meselson and Stahl when (5)

(i) They cultured *E. coli* in a medium containing $^{15}NH_4Cl$ for a few generations and centrifuged the content.

(ii) They transferred one such bacterium to the normal medium of NH_4Cl.

(b) What does the above experiment prove?

(c) Which is the first genetic material identified?

OR

Inheritance pattern of flower colour in garden pea plant and snapdragon differs. Why do we observe such differences? Support your explanation by depicting it in Punnett squares.

26. (a) Explain the property that prevents normal cells from becoming cancerous. (5)

(b) All normal cells have inherent characteristic of becoming cancerous. Explain

(c) Explain any two alternative sources of food that prevent the occurrence of malnutrition diseases in humans.

OR

(a) How is innate immunity different from the immunity that you acquire through vaccines?

(b) Describe any two ways by which innate immunity can be accomplished.

(c) What is the composition of biogas? Name the category of microorganisms responsible for its production. Mention the advantages of having a biogas plant in the rural areas.

27. (a) Particulate and gaseous pollutants along with harmless gases are released from the thermal power plants. (5)

(i) Name any two harmless gases released.

(ii) Name the most widely used device of removing particulate pollutants from the air. Explain how the device is used.

(b) Name the type of food chains responsible for the flow of larger fraction of energy in an aquatic and a terrestrial ecosystem, respectively and distinguish between the two.

OR

(a) Explain, giving one example, how co-extinction is one of the cause leading to loss of biodiversity.

(b) Draw a 'pyramid of numbers' of a situation where a large population of insects feed upon a very big tree and the insects are in turn eaten by small birds, which in turn are fed upon by big birds.

(c) Eutrophication is the natural aging of a lake. Explain.

BEST OF LUCK!