VSA Type Important Questions

1. Give one example each of the fungus which reproduces by :
(a) budding
(b) conidia

2. Which one of the following statements is true of ginger?
(i) Germinating bud appears from the eye of the stem tuber.
(ii) Germinating bud appears from the node of rhizome.
(iii) Germinating bud appears from the notch of the leaf margin.

3. Differentiate between xenogamy and geitonogamy.

4. A bilobed, dithecous anther has 100 microspore mother cells per microsporangium. How many male gametophytes this anther can produce?

5. Write the function of acrosome of human sperm.

6. State a difference between a gene and an allele.

7. Identify the examples of convergent evolution from the following :
(a) Flippers of penguins and dolphins
(b) Eyes of octopus and mammals
(c) Vertebrate brains

8. How do cytokine barriers help in evading viral infections?

9. Write the importance of MOET.

10. Write the scientific name of the microbe used for fermenting malted cereals and fruit juices.

SA-I Type Important Questions

11. (a) Mention the difference in the mode of action of exonuclease and endonuclease.
(b) How does restriction endonuclease function?

12. What does '*cry*' genes in *Bacillus thuringiensis* code for? State its importance in cotton crop.

13. Write the functions of adenosine deaminase enzyme. State the cause of ADA deficiency in humans. Mention a possible permanent cure for an ADA deficiency patient.

14. Differentiate between commensalism and mutualism by taking one example each from plants only.

15. How does the dead organic matter get decomposed in nature? Explain.

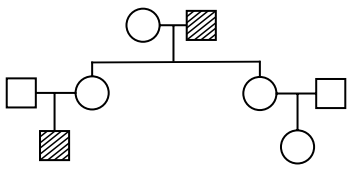
16. Explain how does the algal bloom eventually choke the water body in an industrial area.

17. Name the hormones influencing
(a) ovulation,
(b) development of corpus luteum.

18. Why does a breeder need to emasculate a bisexual flower? Mention a condition in a flower where emasculation is not necessary.

19. How does the gene '*I*' control ABO blood groups in humans? Write the effect the gene has on the structure of red blood cells.

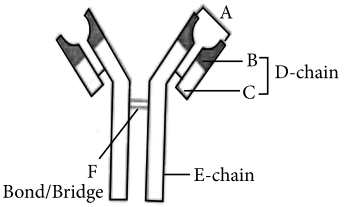
20.



This is the pedigree of a family tracing the movement of the gene for haemophilia. Explain the pattern of inheritance of the disease in the family.

21. Why are thorn of *Bougainvillea* and tendrils of *Cucurbita* called homologous? What does this homology indicate?

22. Identify A, D, E and F in the diagram of an antibody molecule given below:



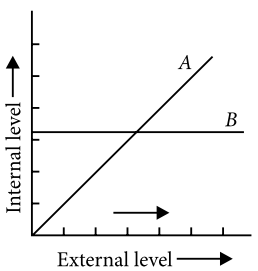
SA-II Type Important Questions

23. With the help of a flow chart, show the phenomenon of biomagnification of DDT in an aquatic food chain.

24. What are the two types of desirable approaches to conserve biodiversity? Explain with examples bringing out the difference between the two types.

25. Alien species are highly invasive and are a threat to indigenous species. Substantiate this statement with any three examples.

26. The following graph represents the organismic response to certain environmental condition (*e.g.*, temperature) :



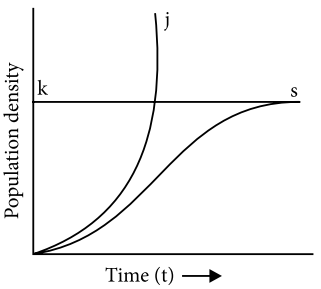
(a) Which one of these, '*A*' or '*B*', depicts conformers?

(b) What does the other line graph depict?

(c) How do these organisms differ from each other with reference to homeostasis?

(d) Mention the category to which humans belong.

27.



A forest hardly has any carnivores. Census of herbivorous mammals was taken and plotted as a graph shown above. Identify the curve that will explain the population growth of herbivores. Give reason to your answer.

28. Draw a schematic diagram of the *E. coli* cloning vector pBR322 and mark the following in it :
(a) *ori*
(b) *rop*
(c) ampicillin resistance gene
(d) tetracycline resistance gene
(e) restriction site *Bam*HI
(f) restriction site *Eco*RI

29. Explain the various steps involved in the production of artificial insulin.

30. (a) How has biotechnology helped in producing *Meloidogyne incognita* resistant tobacco plant?
(b) Why does this nematode die on eating such a GM plant?

31. (a) How is activated sludge formed during sewage treatment?

(b) This sludge can be used as an inoculum or as a source of biogas. Explain.

32. Identify a, b, c, d, e and f in the table given below:

Scientific name of the organism	Product produced	Use in human welfare
Streptococcus	Streptokinase that was later modified	a
b	Cyclosporin A	c
Monascus purpureus	d	e
Lactobacillus	f	sets milk into curd

33. At what stage does *Plasmodium* gain entry into the human body? Write the different stages of its life cycle in the human body.

34. (a) Describe Hardy-Weinberg Principle.

(b) List any four factors which affect genetic equilibrium.

(c) Describe founder effect.

35. Differentiate between divergent and convergent evolution. Give one example of each.

36. (a) What are the transcriptional products of RNA polymerase III?

(b) Differentiate between 'Capping' and 'Tailing'.

(c) Expand hnRNA.

37. (a) Why is *t*RNA called an adaptor?

(b) Draw and label a secondary structure of *t*RNA. How does the actual structure of *t*RNA look like?

38. (a) Name the kind of diseases/disorders that are likely to occur in humans if

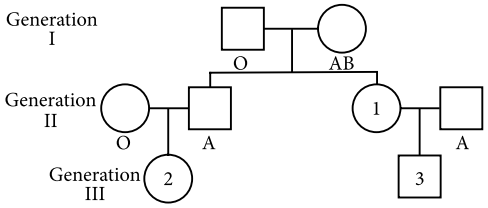
(i) mutation in the gene that codes for an enzyme phenylalanine hydrolase occurs

(ii) there is an extra copy of chromosome 21

(iii) the karyotype is XXY.

(b) Mention any one symptom of the diseases/disorders named above.

39. Study the following pedigree chart of a family starting with mother with AB blood group and father with O blood group.



(a) Mention the blood group as well as its genotype of the offspring numbered 1 in generation II.

(b) Write the possible blood groups as well as their genotypes of the offsprings numbered 2 and 3 in generation III.

40. Give an example of an autosomal recessive trait in humans. Explain its pattern of inheritance with the help of a cross.

41. Draw a diagram of a mature embryo sac of an angiosperm and label the following parts in it.

(a) Filiform apparatus (b) Synergids

(c) Central cells (d) Egg cell

(e) Polar nuclei (f) Antipodals

42. Draw a diagrammatic sectional view of human ovary to show the development of follicles and ovulation. Label the different stages in the diagram.

43. Enumerate the events in the ovary of a human female during:

(a) Follicular phase,

(b) Luteal phase of menstrual cycle.

44. (a) Explain a monohybrid cross taking seed coat colour as a trait in *Pisum sativum*. Work out the cross upto F_2 generation.

(b) State the laws of inheritance that can be derived from such a cross.

Long Answer Type Important Questions

45. (a) Describe the events of spermatogenesis with the help of a schematic representation.

(b) Write two differences between spermatogenesis and oogenesis.

46. (a) Differentiate between dominance and co-dominance.

(b) Explain co-dominance taking an example of human blood groups in the population.

47. In pea plantlet, symbol Y represent dominant yellow; symbol y, the recessive green; symbol R, the round seed shape and symbol r, the wrinkle seed shape. A typical Mendelian dihybrid cross was carried out in pea plants. Write the genotypes of

(a) Homozygous dominant and recessive parents

(b) Gametes produced by both the parents

(c) F_1 offspring

(d) Gametes produced by F_1 offspring

48. (a) Describe the various steps of Griffith's experiments that led to the conclusion of the transforming principle.

(b) How did the chemical nature of the transforming principle get established?

49. (a) List the different attributes that a population has and not an individual organism.

(b) What is population density? Explain any three different ways the population density can be measured, with the help of an example each.

50. Explain with the help of a flow chart recycling of phosphorus in nature. How is phosphorus cycle different from carbon cycle in nature?