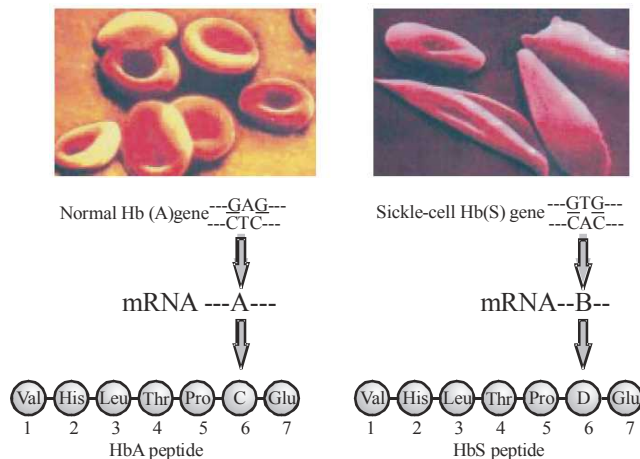






12. See this micrograph of the red blood cells and the amino acid composition of the relevant portion of  $\beta$ -chain of haemoglobin. Find out A, B, C, D represents which option :-



- (1) GAG, GUG, Glu, Val (2) GUG, GAG, Val, Glu  
(3) CTC, CAC, Glu, Val (4) CAC, CTC, Glu, Val
13. When 'Aa' is crossed with 'aa', (A is dominant over a)  
(1) all the offspring will have dominant phenotype.  
(2) all the offspring will have recessive phenotype.  
(3) 50% of offspring will have dominant phenotype and 50% will have recessive phenotype.  
(4) 75% of offspring will have dominant phenotype and 50% will have recessive phenotype.
14. A woman with normal vision has a colorblind father. She marries a colourblind man. What proportion of their children will be colourblind?  
(1) 0% (2) 25% (3) 50% (4) 100%
15. Conditions of a karyotype  $2n \pm 1$  and  $2n \pm 2$  are called:  
(1) Aneuploidy (2) Polyploidy (3) Allopolyploidy (4) Monosomy.
16. The DNA site where DNA-dependent RNA- polymerase binds for transcription, is called  
(1) operator (2) promotor (3) regulator (4) receptor
17. Eukaryotic RNA polymerase III catalyses the synthesis of  
(1) mRNA (2) rRNA (3) hnRNA (4) tRNA
18. The sequence of nitrogen bases in a segment of a coding strand of DNA is ' AATGCTTAGGCA. What will be the sequence of nitrogen bases in the mRNA transcribed by it ?  
(1) UUA CGA AUC CGU (2) AAU GCU AAC CGA  
(3) AAU GCA AUC CGU (4) AAU GCU UAG GCA
19. Homologous organs indicate  
(1) convergent evolution. (2) divergent evolution.  
(3) adaptive radiation. (4) natural selection.
20. Natural selection industrial melanism observed in moth, *Biston bitularia* is a type of  
(1) Stabilising (2) Directional (3) Disruptive (4) Artificial
21. The most accepted line of descent in human evolution is-  
(1) Australopithecus  $\rightarrow$  Ramapithecus  $\rightarrow$  Homo sapiens  $\rightarrow$  Homo habilis  
(2) Homo erectus  $\rightarrow$  Homo habilis  $\rightarrow$  Homo sapiens  
(3) Ramapithecus  $\rightarrow$  Homo habilis  $\rightarrow$  Homo erectus  $\rightarrow$  Homo sapiens  
(4) Australopithecus  $\rightarrow$  Ramapithecus  $\rightarrow$  Homo erectus  $\rightarrow$  Homo habilis  $\rightarrow$  Homo sapiens.

22. Match the following column-I with column-II:-

	Column-I		Column-II
A	Multiple alleles	1	Colour of snapdragon flower
B	Dominant epistasis	2	ABO blood group
C	Complementary genes	3	Fruit colour of <i>Cucurbita pepo</i>
D	Incomplete dominance	4	Flower colour of <i>Lathyrus odoratus</i>

Codes :

	A	B	C	D
(1)	1	2	3	4
(2)	2	3	4	1
(3)	3	4	1	2
(4)	4	3	2	1

23. The letter T in T-lymphocytes refers to

- (1) tonsil                      (2) thalamus                      (3) thymus                      (4) thyroid

24. The immunoglobulin abundant in colostrum, is

- (1) Ig D                      (2) Ig A                      (3) Ig G                      (4) Ig M

25. The technique of obtaining a large number of plantlets by tissue culture method is known as

- (1) organ culture.                      (2) micropropagation.                      (3) plantlet culture.                      (4) macropropagation.

26. How many statements correct for biological oxygen demand (BOD) ?

- (i) The acceleration of microbial activity decreases BOD of water.  
 (ii) BOD is very high in pure water.  
 (iii) If BOD is increases dissolved oxygen also increases in water  
 (iv)  $BOD \propto$  is input of organic wastes

- (1) One                      (2) Two                      (3) Three                      (4) Four

27. Inbreeding is carried out in animal husbandry because it

- (1) increases vigour.                      (2) improves the breed.  
 (3) increases heterozygosity.                      (4) increases homozygosity.

28. *Bacillus thuringiensis* is used to control

- (1) fungal pathogens                      (2) nematodes  
 (3) bacterial pathogens                      (4) insect pests.

29. The vitamin whose content increases following the conversion of milk into curd by lactic acid bacteria is

- (1) vitamin C                      (2) vitamin D                      (3) vitamin B<sub>12</sub>                      (4) vitamin E.

30. Biolistics (gene gun) is suitable for

- (1) introducing rDNA into plant cells                      (2) introducing rDNA into animal cells  
 (3) disarming the pathogen vectors                      (4) DNA Fingerprinting.

31. Plasmids in bacterial cells are
- (1) extra-chromosomal DNA, which cannot replicate
  - (2) extra-chromosomal DNA, which can self-replicate
  - (3) extra DNA associated with the genome
  - (4) extra DNA, associated with the genome, but cannot replicate.
32. The DNA polymerase enzyme used in PCR is obtained from
- (1) *Thermus aquaticus*
  - (2) *Escherichia coli*
  - (3) *Agrobacterium tumefaciens*
  - (4) *Salmonella typhimurium*.
33. Animals from colder climates generally have shorter limbs. This is called
- (1) Allen's rule
  - (2) Johnson's rule
  - (3) Arber's rule
  - (4) Niche rule
34. Niche is defined as
- (1) a component of an ecosystem
  - (2) an ecologically adapted zone of a species
  - (3) the physical position and functional role of a species within the community
  - (4) all plants and animals living at the bottom of a water body.
35. Which of the following is correct statement ?
- (1) In tropical rain forests more energy flows in DFC than GFC
  - (2) In tropical rain forests more energy flows in GFC than DFC
  - (3) In tropical rain forests no energy flows in DFC
  - (4) In tropical rain forests no energy flows in GFC
36. Which of the following represents the sedimentary type of nutrient cycle?
- (1) Nitrogen cycle
  - (2) Carbon cycle
  - (3) Phosphorus cycle.
  - (4) Oxygen cycle
37. Ultraviolet rays causes :-
- (A) Skin cancer
  - (B) High blood pressure
  - (C) Blood sugar
  - (D) DNA damage
- (1) A, B
  - (2) B, C
  - (3) A, D
  - (4) C, D
38. The last stable community in succession that is in equilibrium with the environment, is called
- (1) serai community
  - (2) pioneer community
  - (3) climax community
  - (4) all of these

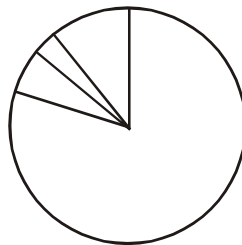
39. The sequence of communities of primary succession in water is
- (1) phytoplankton, sedges, free-floating hydrophytes, rooted hydrophytes, grasses and trees.
  - (2) phytoplankton, free-floating hydrophytes, rooted hydrophytes, sedges, grasses and trees.
  - (3) free-floating hydrophytes, sedges, phytoplankton, rooted hydrophytes, grasses and trees.
  - (4) phytoplankton, rooted submerged hydrophytes, floating hydrophytes, reed swamp, sedges, meadow and trees.

40.  $\log S = \log C + Z \log A$

In the given equation of species-area relationship, the value of regression coefficient for a large continent, would be

- (1) 0.1-0.2                      (2) 0.5-0.7                      (3) 0.6-1.2                      (4) 0.3-0.5

41. In given graph of invertebrates which type of species is maximum :



- (1) Insects                      (2) Molluscs                      (3) Fungi                      (4) Angiosperm

42. Consider the table given below

Crop	Variety	Insect pests
(A)	Pusa Gaurav	Aphids
Flat bean	(B)	Jassids
Okra	Pusa sawani	(C)

Which one of the following option, gives the correct fill ups for the respective blank (A to C)

A	B	C
(1) Wheat	Pusa Shubhra	Boll worms
(2) Brassica	Pusa Komal	Fruit borer
(3) Wheat	Pusa Komal	Boll worms
(4) Brassica	Pusa Sem 2	Short borer

43. If the chromosome number of cells of nucellus of megasporangium of Pinus is 16, what would be the chromosome number of endosperm cells ?

- (1) 32                      (2) 16                      (3) 48                      (4) 8

44. Wind pollinated flowers are
- (1) Small, producing large number of dry pollens
  - (2) Large, producing abundant nectar and pollen
  - (3) Small, producing nectar and dry pollen
  - (4) Small, brightly coloured, producing large number of pollen grains
45. Golden rice is a promising transgenic crop. When released for cultivation, it will help in
- (1) Alleviation of vitamin A deficiency
  - (2) Pest resistance
  - (3) Herbicide tolerance
  - (4) Producing a petrol-like fuel from rice
46. Eutrophication causes a/an
- (1) decrease in organic matter
  - (2) increase in inorganic nutrients
  - (3) decrease in dissolved oxygen
  - (4) increase in dissolved oxygen.
47. Catalytic converters are fitted into automobiles to reduce emission of harmful gases. Catalytic converters change unburnt hydrocarbons into
- (1) carbon dioxide and water
  - (2) carbon mono oxide
  - (3) methane
  - (4) carbon dioxide and methane.
48. Which of the following sets of codons contains only termination codons?
- (1) UAA, UGA, UAG
  - (2) UAA, UUU, UGG
  - (3) UAA, UAG, UAC
  - (4) UUU, UCC, UGG
49. The promoter site and the terminator site for transcription are located at
- (1) 3' (downstream) end and 5' (upstream) end, respectively of the transcription unit.
  - (2) 5' (upstream) end and 3' (downstream) end, respectively of the transcription unit.
  - (3) the 5' (upstream) end.
  - (4) the 3' (downstream) end.
50. The genes cryIAb and cryIIAb produce toxins against \_\_\_\_\_ and \_\_\_\_\_, respectively.
- (1) cotton bollworms, corn borer
  - (2) nematode, cotton bollworm
  - (3) corn borer, cotton bollworm
  - (4) corn borer, nematodes

## **PART-B**

Time Allowed : 2 Hour

Maximum Marks : 50

### **Instructions :**

- Write in a clear legible handwriting.
- There are three sections in Part-B of the question paper and total 1 to 19 question are there.
- All the questions are compulsory. Internal options are given.
- Start new section on new page.
- The numbers at right side represent the marks of the question.
- Maintain sequence.

---

### SECTION-A

❖ **Answer the following 1 to 8. Each question carries 2 marks.**

1. Mention any two differences between asexual reproduction and sexual reproduction. [2]
2. What is evolutionary biology? [2]

**OR**

Mention any two significant roles of LAB.

3. Mention two functions of sertoli cells. [2]
4. What are biocontrol agents? Give one example each of Bacteria, Virus, Fungi and insect, which are used as biocontrol agents? [2]
5. Differentiate homozygous and heterozygous conditions. [2]
6. Write the characteristics of genetic code. [2]
7. Name any two theories that explain the origin of life. [2]
8. What are infectious diseases? Mention an example. [2]

**OR**

Name any two poultry birds which are used for food and eggs.



**SECTION-B**

❖ Answer the following 9 to 14. Each question carries 3 marks.

9. What is biopiracy? Explain it with respect to Basmati rice. [3]
10. What is mutualism? Why plant – animal interaction often involves co - evolution of mutualists? [3]
11. What are ecological pyramids? Mention any two types. [3]

**OR**

What is triple fusion?

12. Write any two examples of homologous organs and analogous organs. [3]
13. Draw a labelled diagram of human sperm. [3]
14. Define pleiotropy. Explain it with respect to phenylketonuria. [3]

**OR**

Define placenta. Mention the functions of placenta.

**SECTION-C**

❖ Answer the following 15 to 18. Each question carries 4 marks.

15. Describe Menstrual cycle in detail. [4]
16. “Mendel’s work was not recognized during his time.”? Give any three reasons. [4]

**OR**

Explain the structure of transcription unit with a labeled diagram.

17. Describe the development of female gametophyte in angiosperm. [4]
18. Write the meaning of the following:  
(a) Algal bloom      (b) Biomagnification      (c) Eutrophication      (d) Greenhouse effect [4]

\*\*\*\*\*