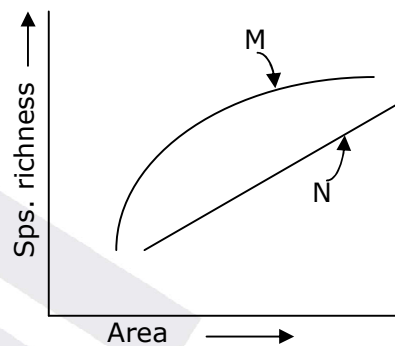


1. Match for M and N with species area relationship shown in the graphic representation below and choose the correct option.



- A) $M \rightarrow S = CA^Z$, $N \rightarrow \log S = \log C + Z \log A$
 B) $M \rightarrow S = CZ^A$, $N \rightarrow \log C = \log S + A \log Z$
 C) $M \rightarrow S = CA^Z$, $N \rightarrow \log S = \log X + A \log Z$
 D) $M \rightarrow S = AZ^C$, $N \rightarrow \log ZA = \log C + \log S$

Ans: (A)

2. Select the option from the following which is not a major characteristic feature of biodiversity hotspots:

- A) Large number of species
 B) Destruction of habitats
 C) Abundance of endemic species
 D) Large number of exotic species

Ans: (D)

3. The biomagnifications of which pollutant causes a decline in the bird population?

- A) Mercury
 B) SO₂
 C) DDT
 D) NO₂

Ans: (C)

4. Snow blindness is caused due to

- A) Global warming
 B) Ozone depletion
 C) Greenhouse effect
 D) Biomagnification

Ans: (B)

5. Match the items of Column I with those of Column II and Choose the correct answer.

	Column I		Column II
1.	Hepatitis B vaccine	I.	IgA
2.	Preformed antibodies	II.	Against snake venom
3.	Colostrum	III.	Neutrophils
4.	PMNL	IV.	Yeast
		V.	Basophils

	1	2	3	4
A	IV	II	I	III
B	I	II	IV	III
C	IV	II	I	V
D	V	II	IV	I

Ans: (A)

6. The correct sequence of taxonomic hierarchy is
- Genus → Family → Class → Order → Phylum → Kingdom → Species
 - Species → Genus → Family → Order → Class → Phylum → Kingdom
 - Species → Family → Genus → Kingdom → Order → Class → Phylum
 - Species → Genus → Family → Class → Order → Phylum → Kingdom

Ans: (B)

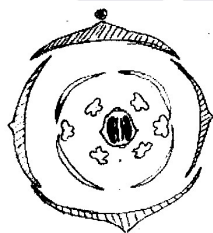
7. Match the animals of Column I with their respective classes in Column II and choose the correct answer.

	Column I		Column II
1.	Aptenodytes	I.	Aves
2.	Hemidactylus	II.	Chondrichthyes
3.	Carcharodon	III.	Mammalia
4.	Pteropus	IV.	Reptilia
		V.	Osteichthyes

	1	2	3	4
A	V	II	IV	I
B	I	IV	III	II
C	V	I	II	III
D	I	IV	II	III

Ans: (D)

8. Choose the correct floral formula of the given floral diagram.



A) $\oplus \begin{matrix} \nearrow \\ \searrow \\ \uparrow \\ \downarrow \end{matrix} K_{(2+2)} C_4 A_{4+2} G_{(3)}$

B) $\oplus \begin{matrix} \nearrow \\ \searrow \\ \uparrow \\ \downarrow \end{matrix} K_{(3)+2} \begin{matrix} \curvearrowright \\ \curvearrowleft \end{matrix} G_{(2+1)}$

C) $\oplus \begin{matrix} \nearrow \\ \searrow \\ \uparrow \\ \downarrow \end{matrix} K_{2+2} C_4 A_{2+4} G_{(2)}$

D) $\oplus \begin{matrix} \nearrow \\ \searrow \\ \uparrow \\ \downarrow \end{matrix} K_{2+2} C_4 A_{2+4} G_2$

Ans: (C)

9. In which type of vascular bundles are Xylem and Phloem present at the same radius?
- Radial
 - Closed
 - Conjoint
 - Exarch

Ans: (C)

10. Conjunctive tissue is present between i and ii in iii.

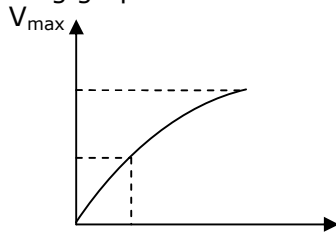
- (i) Pericycle (ii) Endodermis (iii) Dicot root
- (i) Xylem (ii) Phloem (iii) Dicot root
- (i) Palisade Parenchyma (ii) Spongy parenchyma (iii) Dicot leaf
- (i) Xylem (ii) Phloem (iii) Dicot stem

Ans: (B)

11. Identify the major site of biosynthesis of lipids.
- A) Golgi apparatus B) Mitochondria
C) Smooth endoplasmic reticulum (SER) D) Rough endoplasmic reticulum (RER)

Ans: (C)

12. The following graph shows concentration of substrate on enzyme activity:



What does the Y-axis represent?

- A) Temperature B) Velocity of reaction
C) pH D) Pressure

Ans: (B)

13. In the maize plant, CO₂ fixation occurs in both mesophyll and bundle sheath cells. The enzymes involved in these cells for the process respectively are,
- A) RuBisCO and PEP Kinase B) PEP Kinase and Pepsin
C) RuBisCO and PEP Carboxylase D) PEP Carboxylase and RuBisCO

Ans: (D)

14. In the following reaction, identify X and Y respectively:



- A) Water, Acetyl CoA B) Acetyl CoA, Pyruvate dehydrogenase
C) Pyruvate dehydrogenase, Acetyl CoA D) Pyruvate dehydrogenase, Oxalo – acetic acid

Ans: (C)

15. Which of the following factors favourable for the formation of oxyhaemoglobin in the alveoli of human lungs?

- A) High pCO₂ B) Lower temperature
C) High H⁺ concentration D) Low pO₂

Ans: (B)

16. Digestion of both starch and proteins is carried out by enzymes of

- A) gastric juice B) Saliva C) Bile Juice D) Pancreatic juice

Ans: (D)

17. The type of epithelium found in the inner lining of PCT is

- A) Squamous epithelium B) Cuboidal epithelium
C) Glandular epithelium D) Ciliated epithelium

Ans: (B)

18. Select the correct Rh-blood groups of the parents, whose child is affected with erythroblastosis foetalis.

- A) Both father and mother are Rh +ve B) Mother is Rh +ve and father is Rh –ve
C) Both father and mother are Rh-ve D) father is Rh +ve and mother is Rh –ve

Ans: (D)

19. In which of the following groups do the male and female gametophytes have independent, free living existence?

- A) Bryophytes and Gymnosperms B) Bryophytes and Pteridophytes
C) Pteridophytes and Gymnosperms D) Algae and Gymnosperms

Ans: (B)

20. The hormones of "Fright, Fight and Flight" are
 A) Thyroxin and Oxytocin B) Thyroxin and Melatonin
 C) Adrenalin and Nor-adrenalin D) Gastrin and Secretin

Ans: (C)

21. In the given options, which one cannot propagate by vegetative means?
 A) A marginal piece of Bryophyllum leaf B) A middle piece of sugarcane internode
 C) A piece of potato tuber with eyes D) A piece of ginger rhizome

Ans: (B)

22. Among the following statements related to pollen grains, choose the correct one.
 Statement I: In 40% of angiosperms pollen grains are shed at 3-celled stage
 Statement II: Intine is made of cellulose and pectin and it is discontinuous with germ pores
 A) Both I and II are correct B) Both I and II are incorrect
 C) I is correct and II is incorrect D) I is incorrect and II is correct

Ans: (C)

23. Match the animals of Column I with the Column II and select the correct options among the following:

	Column I		Column II
1.	DNA replication	I.	RNA polymerase
2.	Translation	II.	DNA polymerase
3.	Transcription	III.	Reverse transcriptase
4.	Reverse transcriptase	IV.	Aminoacyl synthetase

	1	2	3	4
A	II	IV	III	I
B	II	IV	I	III
C	II	III	IV	I
D	II	I	IV	III

Ans: (B)

24. When pollen grain is shed at 3-celled stage, name the cells it contains.
 A) 1 vegetative cell and 2 male gametes B) 2 vegetative cells and 1 male gamete
 C) 2 generative cells and 1 male gamete D) 2 male gametes and 1 generative cell

Ans: (A)

25. Even in the absence of pollinators, assured seed set will be there in
 A) Chasmogamous flowers B) Geitonogamy
 C) Cleistogamous flowers D) Xenogamy

Ans: (C)

26. The process of conversion of non-motile spermatids into motile spermatozoa is called
 A) Spermiogenesis B) Oogenesis C) Sporogenesis D) Spermatogenesis

Ans: (A)

27. Several mammary ducts join to form a wider structure called
 A) Lactiferous duct B) Mammary lobe
 C) Mammary ampulla D) Mammary tubules

Ans: (C)

28. The signals for the population process originates from
 A) Muscles of uterus
 B) Fully developed foetus and placenta
 C) Placenta
 D) Hormones of ovaries and uterus

Ans: (B)

29. Match the following Column I with Column II:

	Column I		Column II
1.	Surgical methods	I.	Condom
2.	Barrier methods	II.	Pills
3.	Natural methods	III.	Tubectomy
4.	Chemical methods	IV.	Lactational amenorrhea

Select the code for the correct answer from the options given below:

	1	2	3	4
A	III	I	IV	II
B	III	IV	I	II
C	IV	III	II	I
D	II	I	III	IV

Ans: (A)

30. The following factors indicate improved reproductive health of the society. Choose the correct option.

1. Better detection and cure of disease 2. Better post natal care
 3. Medically assisted deliveries 4. Increased MMR

Select the code for the correct answer from the options given below:

- A) 2, 3 and 4 only B) 1, 2 and 3 only C) 1, 3 and 4 only D) 1, 2 and 4 only

Ans: (B)

31. ABO blood type in man is an example of

- 1) Pleiotropy 2) Incomplete dominance
 3) Co-dominance 4) Multiple allelism

Select the code for the correct answer from the options given below:

- A) 1, 2 and 3 only B) 1, 3 and 4 only C) 3 and 4 only D) 1, 2 and 4 only

Ans: (C)

32. The codon on mRNA are

CAU – CCU – AAA – CUG

Identify the correct sequence of amino acids.

- A) His – Pro – Lys – Leu B) Pro – His – Lys – Leu
 C) His – Pro – Leu – Lys D) Pro – Leu – Lys – His

Ans: (A)

33. Choose the possible genotypes responsible for lightest skin colour in human beings

- A) AABbCC b) AaBbCc c) aabbcc d) AABbCc

Ans: (C)

Genotype all the recessive (aabbcc) will have lightest skin colour.

34. Both male and female have normal vision though their fathers were colour blind, and mothers did not have any gene for colour blindness. The probability of their daughter becoming colour blind is
- A) 0% B) 15% C) 25% D) 50%

Ans: (A)

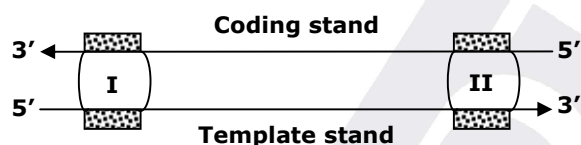
35. Find the nucleotide sequence of the mRNA which codes for the sequence of amino acids – 'Met – Leu – Val – Arg – Ala' and Choose the correct option from below:
- A) AUG – GAU – GAA – UAU – UGU B) AGU – GAU – GAA – CGU – GCC
C) AUG – CUA – GUG – UAU – UGU D) AGU – CUA – GUG – CGU – GCC

Ans: (D)

36. Sickle-cell anaemia is due to the following mutant gene:
- A) CTC – CAC B) CTC – GAG C) CAC – GUG D) GAG – GUG

Ans: (A)

37. In the given transcription unit, identify the regions I and II respectively.



- A) Promoter and Terminator B) Rho factor and Sigma factor
C) Terminator and Promoter D) Operator and Inhibitor

Ans: (C)

38. Which of the following sequences of mRNA are required for translation process but are not translated?
- A) Stop codons B) Anticodons C) Sense codons D) UTR

Ans: (D)

39. Identify the palindromic sequence in the following base sequence :

- A) 5'—C G A T A—3'
3'—G C T A T—5'
- B) 5'—C G A T C C—3'
3'—C C T A G G—5'
- C) 5'—C C T G C—3'
3'—G G A C G—5'
- D) 5'—G A A T T G—3'
3'—C T T A A C—5'

Ans: (B)

40. DNA, present in the nucleus, was named as 'Nuclein' by
- A) James Watson and Crick B) Friedrich Miescher
C) Maurice Wilkins D) Rosalind Franklin

Ans: (B)

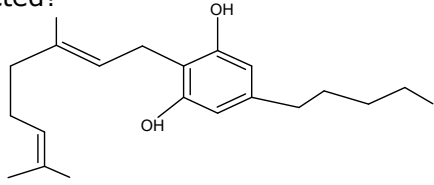
41. When does the lac-operon in E.Coli becomes "switched on"?
- A) Repressor binds to operator
B) RNA polymerase binds to operator
C) Lactose is present and it binds to the repressor
D) Lactose is present and it binds to RNA polymerase

Ans: (C)

42. The Primary gases that were used by Miller in his experiment are
- A) CH₄, NH₃, H₂O, H₂ B) CH₄, CO₂, N₂, SO₂
C) CH₄, CO₂, N₂, NH₃ D) CH₄, N₂, NH₃, H₂

Ans: (A)

43. From which of the given plants is the drug whose skeletal structure is given below extracted?



- A) *Papaver somniferum* B) *Atropa belladonna*
 C) *Cannabis sativa* D) *Erythroxylum coca*

Ans: (C)

44. The allele frequency of 'A' and 'a' in a population are 0.6 and 0.4 respectively. The expected frequency of heterozygous individuals is
- A) 48% B) 36% C) 16% D) 24%

Ans: (A)

45. Identify the odd one from the following:
- A) α -Interferon B) Oncogenic virus C) Proto-oncogenes D) UV rays

Ans: (A)

46. During replication of retrovirus
- A) Viral protein is introduced in the host cell
 B) Viral RNA is introduced into the host cell
 C) Viral DNA is introduced into the host cell
 D) Transcriptase enzyme is introduced in to the host cell

Ans: (B)

47. In malignant tumors, the cells divide rapidly and move to distant parts of the body and cause new tumors. This property is called
- A) Metastasis b) Metagenesis C) Teratogenesis D) Mitosis

Ans: (A)

48. The breeding technique that is useful to expose harmful recessive genes is
- A) Outbreeding B) Artificial insemination
 C) Inbreeding D) MOET

Ans: (C)

49. Germplasm collection refers to
- A) Collection of all alleles for all genes in a crop
 B) Collection of all alleles for few genes in a crop
 C) Collection of different alleles for all genes in different crop plants
 D) Collection of few alleles for all genes in several crop plants.

Ans: (A)

50. The microorganisms involved in floc formation during sewage treatment are
- A) Anaerobic bacteria and fungus B) Aerobic bacteria and fungus
 C) Autotrophic bacteria and yeast D) Fungus and algae

Ans: (B)

51. Match the following bacteria of List I with their commercial products of List II:

List I		List II	
1.	<i>Lactobacillus</i>	I	Butyric acid
2.	<i>Aspergillus niger</i>	II	Acetic acid
3.	<i>Acetobacteraceae</i>	III	Lactic acid
4.	<i>Clostridium butyricum</i>	IV	Citric acid

Select the code for the correct answer from the options given below:

	1	2	3	4
(A)	III	II	IV	I
(B)	I	IV	III	II
(C)	III	IV	II	I
(D)	III	IV	I	II

Ans: (C)

52. The technique of bombarding plant cells with high velocity microparticles of gold or tungsten, coated with DNA, is

- A) Microinjection
 B) Biolistic method
 C) Heat shock method
 D) By disarmed pathogen vector

Ans: (B)

53. Choose the bacterium which is not a source of REN.

- A) *Haemophilus influenzae*
 B) *Escherichia coli*
 C) *Agrobacterium tumefaciens*
 D) *Bacillus amyloliquefaciens*

Ans: (C)

54. Silencing of specific mRNA translation could be achieved through

- A) Antisense RNA
 B) RNA interference technique
 C) Both (A) and (B)
 D) Microinjection

Ans: (C)

55. In which of the following steps in DNA fingerprinting technique are labelled VNTR probes used?

- A) During isolation of DNA
 B) During digestion of DNA by REN
 C) During electrophoresis
 D) During hybridization

Ans: (D)

56. dsRNA is used to develop pest resistant tobacco plant by a technique called

- A) Polymerase Chain Reaction (PCR)
 B) RNA interference (RNAi)
 C) Electrophoresis
 D) Insertional Activation

Ans: (B)

57. The interaction between "Cuckoo and Crow" is an example for

- A) Competition
 B) Predation
 C) Brood parasitism
 D) Mutualism

Ans: (C)

58. Verhulst-Pearl logistic growth is described by the equation $\frac{dN}{dt} = rN \left[\frac{K-N}{K} \right]$, where 'r' and 'K' represent.

- A) r – intrinsic rate of natural decrease, K – carrying capacity
- B) r – intrinsic rate of natural increase, K – carrying capacity
- C) r – extrinsic rate of natural increase, K – productive capacity
- D) r – extrinsic rate of natural decrease, K – carrying capacity

Ans: (B)

59. Net primary productivity (NPP) in an ecosystem is

- A) $GPP - R = NPP$
- B) $GPP + R = NPP$
- C) $GPP - NPP = R$
- D) $R - NPP = GPP$

Ans: (A)

60. Which among the following is not a functional unit of the ecosystem?

- A) Decomposition
- B) Nutrient cycling
- C) Energy flow
- D) Pollution

Ans: (D)