



BOARD KCET PYQ (2022)

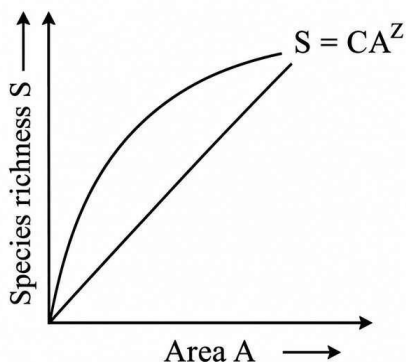
Kannada

BOTANY

1. A series of experiments were conducted by Frederick Griffith in 1928, on transforming principle with
(A) *Streptococcus pneumoniae*
(B) *Escherichia coli*
(C) *Bacillus thuringiensis*
(D) *Salmonella typhimurium*
2. The number of codons effective in coding twenty amino acids:
(A) 20 (B) 61
(C) 32 (D) 64
3. Which aspect forms the basis of DNA finger-printing?
(A) The amount of DNA found in samples of blood, saliva and skin
(B) The ratio of purines and pyrimidines present in DNA
(C) The Sequence of DNA present in the ridges and grooves of finger-prints
(D) The Satellite DNA showing high degree of repetition in DNA segments
4. The large holes in 'Swiss - Cheese' are made by a
(A) Fungus that releases a lot of gases during metabolic activities
(B) Machine
(C) Bacterium that produces methane gas
(D) Bacterium producing a large amount of CO₂
5. Which vitamin is increased by 'LAB' in curd?
(A) Vitamin E
(B) Vitamin C
(C) Vitamin B
(D) Vitamin B12
6. Enzyme which is useful to remove the oily stains in laundry?
(A) Lipase (B) Renin
(C) Protease (D) Amylase
7. DNA replicates semi conservatively was first shown in:
(A) Higher animals
(B) *Escherichia coli*
(C) Human cell
(D) Plants
8. Average natality rate in our village is 25, average mortality is 24, immigration 2 and emigration 3 and the net increase in population is:
(A) 27 (B) 0
(C) 5 (D) 10
9. Which of the following statement is incorrect related to biomes?
(A) Low temperature and less rainfall is a characteristics of Tundra biomes
(B) Variation in temperature and mean precipitation accounts for the major biomes
(C) More rainfall and low temperature is the characteristics of deserts
(D) High temperature and minimum rainfall help to form grasslands
10. The amount of Photosynthetically active radiation captured by plants is Options:
(A) 12-20 percent
(B) 20-30 percent
(C) 2-10 percent
(D) 60-70 percent



11. The given graph represents



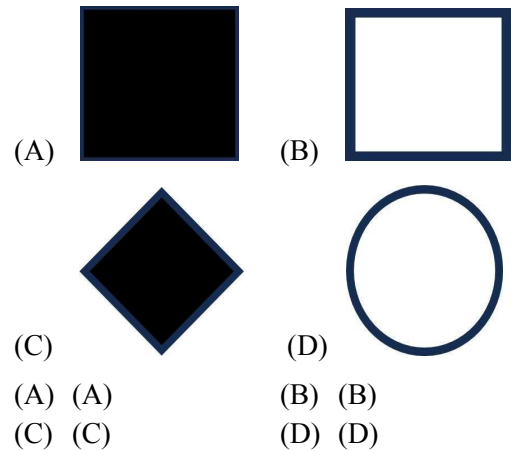
- (A) Population growth
(B) Enzyme activity
(C) Species area relationship
(D) Growth of organisms
12. *Cuscuta* is an example of
(A) Predation
(B) Broad Parasitism
(C) Endoparasitism
(D) Ectoparasitism
13. Bovine spongiform encephalopathy is caused by
(A) Fungi (B) Viroids
(C) Prions (D) Virus
14. Phycoerythrin and Floridian starch is found in
(A) Red algae
(B) Blue - green algae
(C) Green algae
(D) Brown algae
15. Which of the following plant is used to extract Colchicine?
(A) Tulip
(B) Colchicum
(C) Aloe
(D) Asparagus
16. Cell theory was formulated by
(A) Schwann and Robert Brown
(B) Schleiden and Schwann
(C) Robert Hook and Robert Brown
(D) Schleiden and Robert Brown

17. Enzyme involved in crossing over
(A) Ligase
(B) Recombinase
(C) Polymerase
(D) Endonuclease
18. Kranz anatomy can be seen in
(A) Maize (B) Tomato
(C) Potato (D) Pea
19. Respiratory quotient of glucose is
(A) 1.0 (B) 0
(C) 0.7 (D) 0.9
20. Binomial nomenclature is introduced by
(A) John Ray
(B) Carolus Linnaeus
(C) Lamarck
(D) Bentham and Hooker
21. An example of dioecious plant :
(A) Papaya (B) Cucurbita
(C) Coconut (D) Mango
22. Stalk of the Stamen is:
(A) Peduncle (B) Filament
(C) Pedicel (D) Petiole
23. The ovule of angiosperm is technically known as :
(A) Megaspore
(B) Megasporangium
(C) Megasporophyll
(D) Megaspore mother cell
24. Typical mature embryosae of angiosperm is
(A) 8 nucleated 1 celled structure
(B) 8 nucleated 8 celled structure
(C) 8 nucleated 7 celled structure
(D) 7 nucleated 8 celled structure
25. One of the 2000 years old viable seed, discovered during the archeological excavation at King Herold's near dead sea.
(A) Lupin

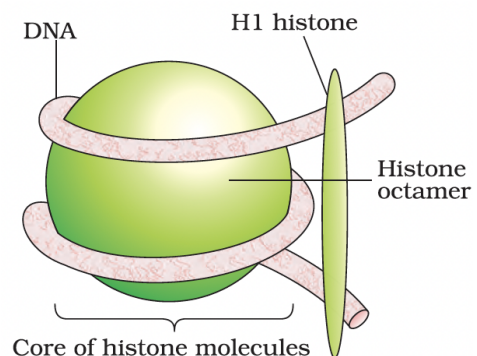


- (B) Sunflower
(C) *Phoenix dactylifera*
(D) Maize
26. XO type of sex determination and XY type of sex determination are the examples of
(A) Female Homogamety
(B) Male Heterogamety
(C) Female Heterogamety
(D) Male Homogamety
27. Example for Non-Mendelian disorder:
(A) Cystic fibrosis
(B) Haemophilia
(C) Down's syndrome
(D) Thalassemia
28. Gynecomastia is a symptom of
(A) Cri-du-chat syndrome
(B) Down's syndrome
(C) Klinefelter's syndrome
(D) Turner's syndrome

29. The affected male in the pedigree chart is symbolized by :



30. The given diagram represents:



- (A) Mesosome (B) Chromosome
(C) Ribosome (D) Nucleosome



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Hint & Solution

1. (A)
Frederick Griffith performed experiments on *Streptococcus pneumoniae*.
He used virulent S strain and non-virulent R strain bacteria.
Heat-killed S strain transformed live R strain into virulent form.
This experiment demonstrated transforming principle.
Later this transforming material was identified as DNA.
2. (B)
Total number of codons in genetic code is 64.
Three codons function as stop codons.
Remaining 61 codons code for amino acids.
More than one codon may code for same amino acid.
Thus 61 codons are effective in coding amino acids.
3. (D)
DNA fingerprinting is based on satellite DNA sequences.
These regions show high degree of repetition.
Satellite DNA exhibits polymorphism among individuals.
Variation in repeat sequences produces unique DNA patterns.
Thus, repetitive satellite DNA forms basis of DNA fingerprinting.
4. (D)
Swiss cheese contains large holes due to bacterial activity.
Propionibacterium shermanii is involved in cheese formation.
This bacterium releases large amount of carbon dioxide.
Accumulated gas forms characteristic holes.
Thus CO₂-producing bacteria create Swiss cheese holes.
5. (D)
Lactic acid bacteria convert milk into curd.
LAB improves nutritional quality of curd.
Vitamin B₁₂ content increases during curd formation.
Curd also suppresses disease-causing microbes.
Thus, LAB increases vitamin B₁₂ in curd.
6. (A)
Lipase breaks down fats into fatty acids and glycerol.
Laundry detergents contain lipase enzymes.
Oily stains mainly contain lipid substances.
Lipase helps remove grease effectively.
Thus, lipase removes oily stains from clothes.
7. (B)
Semi-conservative replication
Meselson and Stahl demonstrated semi-conservative DNA replication.
Their experiment was conducted on *Escherichia coli*.
Nitrogen isotopes were used to trace DNA strands.
Each daughter DNA molecule contained one parental strand.
Thus, semi-conservative replication was shown in *E. coli*.



- 8. (B)**
Population change depends on natality, mortality, immigration and emigration.
Net increase = (births + immigration) – (deaths + emigration).
Given values are $25 + 2 - 24 - 3$.
Result becomes zero.
Thus, there is no net population increase.
- 9. (C)**
Deserts are characterized by very low rainfall.
Temperature may be extremely high during daytime.
Water availability remains limited.
Sparse vegetation is commonly seen in deserts.
Thus, “more rainfall and low temperature” is incorrect for deserts.
- 10. (C)**
Only small fraction of solar radiation is captured by plants.
Photosynthetically active radiation ranges from 400–700 nm.
Green plants capture nearly 2–10% of PAR.
Captured light energy drives photosynthesis.
Thus, plants capture about 2–10% PAR.
- 11. (C)**
Species richness increases with explored area.
This relation forms rectangular hyperbola graphically.
Larger habitats support more species diversity.
Alexander von Humboldt observed this relationship.
Thus, graph represents species-area relationship.
- 12. (D)**
Cuscuta grows externally on host plant stem.
It absorbs nutrients through haustoria.
Parasite remains outside host body.
Dependence occurs for nutrition and survival.
Thus, Cuscuta is ectoparasite.
- 13. (C)**
- 14. (B)**
Red algae contain phycoerythrin pigment.
This pigment imparts red coloration.
Stored food material is Floridean starch.
Most members are marine algae.
Thus, phycoerythrin and Floridean starch occur in red algae.
- 15. (B)**
- 16. (B)**
Schleiden and Schwann formulated cell theory.
They concluded all organisms are composed of cells.
Cells are structural and functional units of life.
Schleiden studied plants and Schwann studied animals.
Thus, both scientists proposed cell theory.
- 17. (B)**
Crossing over occurs during pachytene stage of meiosis.
Exchange occurs between non-sister chromatids.
Recombinase enzyme catalyses the process.
Genetic recombination produces variations.
Thus, recombinase is involved in crossing over.
- 18. (A)**
Kranz anatomy occurs in C₄ plants like maize.
Bundle sheath cells surround vascular bundles prominently.
These cells contain large chloroplasts.
This adaptation reduces photorespiration.
Thus, maize shows Kranz anatomy.
- 19. (A)**
Respiratory quotient is ratio of CO₂ evolved to O₂ consumed.
Complete oxidation of glucose produces equal CO₂ and O₂ values.
Therefore, RQ becomes one.
Glucose undergoes aerobic respiration completely.
Thus, respiratory quotient of glucose is 1.0.



- 20. (B)**
Carolus Linnaeus introduced binomial nomenclature.
Each organism receives genus and species names.
Scientific naming became universal and standardized.
Names are generally Latinized.
Thus, Linnaeus introduced binomial nomenclature.
- 21. (A)**
Dioecious plants bear male and female flowers on separate plants.
Papaya is dioecious plant.
Cross-pollination becomes compulsory.
Self-pollination cannot occur in separate sexes.
Thus, papaya is dioecious.
- 22. (B)**
Stamen consists of filament and anther.
Filament acts as stalk of stamen.
Anther contains pollen sacs.
Filament supports anther for pollen dispersal.
Thus, stalk of stamen is filament.
- 23. (B)**
Ovule is technically called megasporangium.
Megaspore mother cell develops within ovule.
Embryo sac forms inside nucellus.
After fertilization ovule develops into seed.
Thus, ovule represents megasporangium.
- 24. (C)**
Typical embryo sac is 8-nucleate and 7-celled.
Egg apparatus occurs at micropylar end.
Three antipodal cells occur at chalazal end.
Central cell contains two polar nuclei.
Thus, mature embryo sac is 8-nucleate and 7-celled.
- 25. (C)**
Phoenix dactylifera seed remained viable for nearly 2000 years.
It was discovered near the Dead Sea.
Under suitable conditions the seed germinated successfully.
- Seed longevity depends on storage conditions.
Thus, date palm showed remarkable viability.
- 26. (B)**
XO and XY systems represent male heterogamety.
Males produce two different gametes.
Females produce similar X-bearing gametes.
Sex determination depends on sperm type.
Thus, XO and XY are male heterogametic systems.
- 27. (C)**
Klinefelter's syndrome has XXY chromosome complement.
Affected males develop feminine characteristics.
Gynecomastia refers to development of breasts in males.
Sterility may occur in affected individuals.
Thus, gynecomastia is symptom of Klinefelter's syndrome.
- 28. (C)**
1. mRNA is complementary to template DNA.
 2. Uracil replaces thymine in RNA.
 3. RNA forms in 5' to 3' direction.
 4. Sequence becomes UACGAAGGCUUA.
 5. Transcription forms RNA molecules.
- 29. (A)**
Square symbol represents male individual.
Shaded symbol indicates affected condition.
Circle represents female individual.
Thus, affected male is shown by shaded square.
Pedigree analysis traces inheritance of traits.
- 30. (D)**
Nucleosome is structural unit of chromatin.
DNA wraps around histone octamer.
Histones help in DNA packaging.
Nucleosomes appear as bead-like structures.
Thus, diagram represents nucleosome.