

KCET 2015 BIOLOGY QUESTION PAPER

1. Which vector can clone a small fragment of DNA?
 - a) Bacterial artificial chromosome
 - b) Yeast artificial chromosome
 - c) Plasmid
 - d) Cosmid
2. Continuous self-pollination results in
 - a) Inbreeding depression
 - b) Self-incompatibility
 - c) Formation of Unisexual flowers
 - d) Gametes lose vigour
3. Identify the wrong statement.
 - a) Alleles I^A and I^B produce sugars.
 - b) Both I^A and I^B are present together and they express because of co – dominance
 - c) Alleles b and c also produce sugar
 - d) When I^B and b or i are present only I^B is expressed.
4. The codon AUG had dual function. It is an initiation codon and also codes for
 - a) Formaldehyde
 - b) Methionine
 - c) Phenylalanine
 - d) Serine
5. Natural killer lymphocytes are an example for
 - a) Cytokine barrier
 - b) Physiological barrier
 - c) Physical barrier
 - d) Cellular barrier
6. Identify the phylum X:

ANIMALIA

↓

TISSUE GRADE

↓

BILATERAL

↓

ACOELOMATE

↓

X

 - a) Aschelminthes
 - b) Ctenophora
 - c) Hemichordata
 - d) Platyhelminthes
7. With respect to Eichhornia:

Statement X: It drains off Oxygen from water and is seen growing in standing water.

Statement Y: It is indigenous species of our country

 - a) Both statement X and Y are correct
 - b) Both Statement X and Y are wrong
 - c) Only statement X is correct and Y is wrong
 - d) Only statement Y is correct and X is wrong
8. Seeds without fertilization is obtained from
 - a) Parthenocarpy
 - b) Apomixis
 - c) Polyembryony
 - d) Dormancy
9. The hormone which acts on Sertoli cells and stimulates the process of spermiogenesis is
 - a) Androgen
 - b) LH
 - c) GnRH
 - d) FSH
10. The nitrogen base only in DNA is also called
 - a) 5 – methyl uracil
 - b) NH_4Cl
 - c) Uracil
 - d) Guanine
11. Hisardale is obtained by crossing
 - a) Merino ewes with Bikaneri Rams
 - b) Bikaneri ewes with Merino Rams
 - c) Horse with Donkey
 - d) Superior Bull with superior Cow
12. The ancestors of modern day Frogs and Salamanders are
 - a) Jawless Fish
 - b) Coelacanth
 - c) Ichthyopsis
 - d) Amphioxus
13. During sewage treatment biogas produced includes
 - a) Methane, Oxygen, Hydrogen sulphide
 - b) Hydrogen sulphide, Methane, Sulphur oxide
 - c) Hydrogen sulphide, Nitrogen Methane
 - d) Methane, Hydrogen sulphide, Carbon dioxide

14. If 30j of energy is trapped at producer level, then how much energy will be available to Peacock as food in the following chain?
Plant → Mice → Snake → Peacock

- a) 0.03j b) 0.003j
c) 0.3 j d) 0.0003j

15. Which of the following is not an ex - situ conservation?

- a) Seed bank b) Botanical garden
c) Cryopreservation d) Biosphere reserves

16. One hormone hastens maturity period in juvenile conifers, a second hormone controls xylem differentiation, while the third increases the tolerance of plants to various stresses. They are respectively

- a) Auxin, Gibberellins, Cytokinin
b) Auxin, Gibberellins, ABA
c) Gibberellin, Auxin, Cytokinin
d) Gibberellin, Auxin, ABA

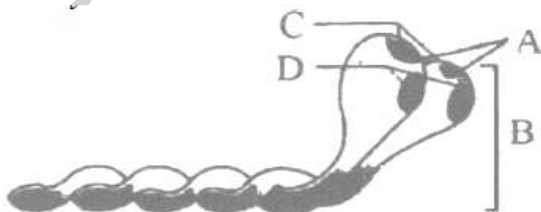
17. The element responsible for the ring structure of chlorophyll and maintenance of ribosome structure is

- a) Mg^+ b) K^+
c) Ca^{++} d) S

18. Which of the following sentence is correct?

- a) Cells of all living organisms have a nucleus
b) Both animal and plant cells have a well - defined cell wall.
c) In prokaryotes there are no membrane bound cell organelles
d) Cells are formed de novo from abiotic materials

19. Label the correct parts of the Myosin monomer:



- a) A. Cross arm B. Actin Binding site
 C. Head D. ATP binding site
b) A. Head
 B. Cross arm
 C. Actin binding site
 D. ATP binding site

- c) A. Actin binding site
 B. Head
 C. ATP binding site
 D. Cross arm

- d) A. ATP binding site
 B. Actin binding site
 C. Head
 D. Cross arm

20. The 2000 - year - old seed excavated from Herod's place at dead sea belongs to

- a) Lupine arcticus
b) Strobilanthes Kunthiana
c) Dendrocalamus strictus
d) Phoenix Dactylifera

21. In a human foetus the limbs and digits develop after

- a) First trimester b) 8 weeks
c) 12 weeks d) 5th month

22. With respect to phenylketonuria identify which statement is not correct

- a) It is an example of pleiotropy
b) It is an error in metabolism
c) It is a case of aneuploidy
d) Caused due to autosomal recessive trait.

23. Match the following

- | | |
|----------------------|-----------------------|
| A. VNTR | p. Largest gene |
| B. Introns and Exons | q. DNA fingerprinting |
| C. Dystrophin | r. Bulk DNA |
| D. Satellite DNA | s. Splicing |
- a) A - q, B - s, C - p, D - r
b) A - s, B - p, C - q, D - r
c) A - r, B - s, C - p, D - q
d) A - q, B - p, C - s, D - r

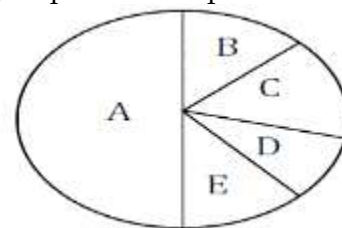
24. RNA polymerase - I transcribes eukaryotic ribosome which does not consist of

- a) 28 SrRNA b) 5 SrRNA
c) 5.8 SrRNA d) 18 SrRNA

25. The organism which completely lack a cell and can live without oxygen are

- a) Archaeobacteria
b) Thermoacidophiles
c) Mycoplasma
d) Methanogens

26. Green house crops such as tomatoes and bell pepper produce higher yields. This is due to
- CO_2 is a limiting factor to photosynthesis
 - Tomatoes and bell pepper are not C_3 plants.
 - CO_2 enriched atmosphere leads to higher yields
 - Diffused light in green house
27. A fall in glomerular filtration rate activates
- Juxta glomerular cells to release rennin
 - Adrenal cortex to release adrenaline
 - Adrenal medulla to release adrenaline
 - Posterior pituitary to release vasopressin.
28. The chromosome number in meiocyte is 34. The organism could be
- Dog
 - Apple
 - Ophioglossum
 - Onion
29. Progestasert in an IUD which makes the uterus unsuitable for implantation and cervix hostile to the sperms as they are
- Copper releasing IUDs
 - Non - medicated IUDs
 - Hormone releasing IUDs
 - Ideal contraceptive
30. Double line in pedigree analysis show
- Sex unspecified
 - Consanguineous marriage
 - Unaffected offspring
 - Normal mating
31. Smack and Crack are produced from
- Cannabis sativa and Atropa belladonna
 - Papaver somniferum and Erythroxyllum coca
 - Cannabis sativa and Papaver somniferum
 - Erythroxyllum coca and Atropa belladonna
32. Sonalika and Kalyan Sona are high yielding varieties of
- Rice
 - Maize
 - Sugarcane
 - Wheat
33. BOD refers to
- The amount of oxygen consumed if all the organic matter in 1000 ml of water were oxidized by bacteria.
 - The amount of oxygen released when all the organic matter was consumed by bacteria in 1 litre of water.
 - The oxygen required for bacteria to grow in 1 litre of effluent.
 - The amount of oxygen released if all the organic matter in 1000 ml of water were oxidized by bacteria.
34. During menstrual cycle the cyclical changes takes place in
- Endometrium
 - Myometrium
 - Perimetrium
 - Corpus luteum
35. Assisted Reproductive Technology does not include?
- In vitro fertilization and embryo transfer
 - Gamete intra fallopian transfer
 - Zygote extra fallopian transfer
 - Artificial insemination
36. In a 3.2 Kbp long piece of DNA, 820 adenine bases were found. What would be the number of cytosine bases?
- 1560
 - 1480
 - 780
 - 740
37. Given below is the representation of the extent of global diversity of vertebrates. What group does the portions represents.



- | A | B | C | D |
|------------|------------|----------|------------|
| a) Mammals | Birds | Fishes | Amphibians |
| E | | | |
| b) Fishes | Mammals | Birds | Reptiles |
| | Amphibians | | |
| c) Birds | Reptiles | Fishes | Mammals |
| | Amphibians | | |
| d) Fishes | Amphibians | Mammals | Birds |
| | Reptiles | | |

38. Choose the correct statement:

- Pyruvate is formed in the mitochondrial matrix
- During the conversion for Succinyl CoA to Succinic acid a molecule of ATP is synthesized.
- Oxygen is vital in respiration for removal for Hydrogen
- There is a complete breakdown of glucose in fermentation

39. According to Robert Costanza, 50% of the total cost for ecosystem services goes to

- Recreation
- Climate regulation
- Nutrient Cycling
- Soil formation

40. The function of a selectable marker is

- Identify ori site
- To destroy recognition sites
- Eliminating transformants and permitting non - transformants
- Elimination of non - transformants and permitting transformants

41. Find the wrongly matched pair:

- Endemism - Species confined to one region and also found in other regions.
- Alien species - *Clarias gariepinus*
- Lungs of the planet - Amazon rain forest
- Hot spots - Regions with species richness

42. If an inheritable mutation is observed in a population at high frequency, it is referred to as

- DNA polymorphism
- Expressed sequence Tag
- Sequence annotation
- Linkage

43. Which of the following would most likely help to slow down the greenhouse effect?

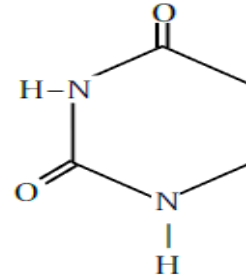
- Ensuring that all excess paper packaging is burned to ashes
- Promoting the use of private rather than public transport
- Converting tropical forests into grazing land for cattle
- Redesigning and fill dumps to allow methane to be collected

44. Select the mismatch pair from the following:

- Insulin - Gluconeogenesis
- Glucagon - Glycogenolysis

- Oxytocin - Contraction of Uterine muscles
- Prolactin - Milk production in Mammary glands

45. Identify this structure



- Uracil
- Adenosine
- Adenylic Acid
- Cholesterol

46. Which of the following is not correct in mass flow hypothesis?

- The sugar is moved bidirectionally
- Loading of the phloem sets up a water potential gradient that facilitates the mass movement in the phloem.
- As hydrostatic pressure in the phloem sieve tube increases pressure flow stops and sap is accumulated in phloem.
- The sugar which is transported is sucrose.

47. In prokaryotes the Glycocalyx when it is thick is called?

- Slime layer
- Mesosome
- Capsule
- Cell wall

48. The T - wave in an ECG represents

- Electrical excitation of atria
- Return of the ventricles from excited state
- Depolarisation of ventricles
- Beginning of systole

49. Ernest chain and Howard Florey's contribution was

- Discovery of Streptokinase
- Discovery of DNA sequence
- Establishing the potential of penicillin as an effective antibiotic
- Production of genetically engineered insulin

50. Which of the following is not correct with respect to malaria?

- Sporozoites multiply in blood
- Malignant malaria is caused by *Plasmodium falciparum*.
- RBCs rupture and release haemozoin which causes chills.
- Female anopheles mosquito is the vector.

51. Three copies of chromosome - 21 in a child with Down's syndrome have been analysed using molecular biology technology to detect any possible DNA polymorphism with reference to different alleles located on chromosome - 21. Results showed that out of 3 copies 2 of the chromosomes of the child contain the same alleles as one of the mother's alleles. Based on this when did the non - disjunction event most likely occur?

- Maternal meiosis - I
- Maternal meiosis - II
- Paternal meiosis - III
- Paternal meiosis - II

52. In 125 amino acid sequence if the codon for 25th amino acid is mutated to UAA, then

- A polypeptide of 124 amino acid is formed
- A polypeptide of 25 amino acids is formed
- A polypeptide of 24 amino acids is formed
- No polypeptides are formed

53. A scrubber in the exhaust of a chemical industrial plant removes

- Gases like sulphur dioxide
- Particulate matter of the size 5 micrometers or above
- Gases like ozone or methane
- Gases like Nitrous oxide

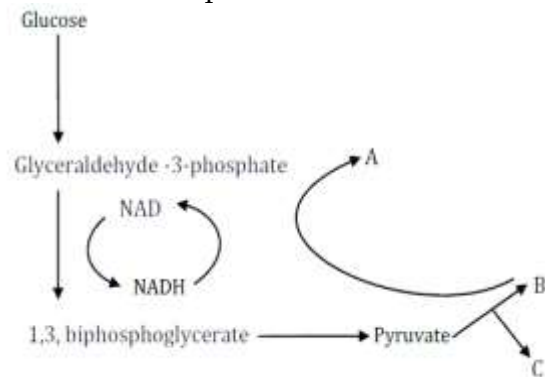
54. The formation of two species from one ancestral species is known as

- Phyletic evolution
- Divergent evolution
- Convergent evolution
- Allopatry

55. The breakdown of detritus into small particles by detritivores is called

- Humification
- Catabolism
- Leaching
- Fragmentation

56. Choose the correct combination of labelling the molecules involved in the pathway of anaerobic respiration in Yeast.



- A - Ethanol, B - CO₂, C - Acetaldehyde
- A - CO₂, B - Ethanol, C - Acetaldehyde
- A - Acetaldehyde, B - CO₂, C - Ethanol
- A - Ethanol, B - Acetaldehyde, C - CO₂

57. Which of the following conditions correctly describes the manner of determining the sex in the given example?

- XO type of sex determines male sex in grasshopper.
- XO condition in humans as found in Klinefelter's syndrome determines female sex.
- Homozygous sex Chromosome XX produce male in *Drosophila*
- Homozygous sex chromosomes ZZ determines female sex in birds

58. Hibernating animals have tissue containing mitochondria with a membrane protein that accelerates electron transport while blocking the synthesis of ATP. What is the consequence of this?

- Energy is saved because glycolysis and the citric acid cycle shuts down.
- The energy of respiration is converted into heat
- Hibernating animals can synthesize fat instead of wasting energy of respiration
- Pyruvate is converted to lactic acid by anaerobic fermentation

59. The pioneer species in Hydrarch and Hydrach succession are respectively
- Lichens and sedges
 - Lichens and rooted hydrophytes
 - Lichens and phytoplanktons
 - Phytoplanktons and lichens
60. With respect to DNA fragmentation
- Statement A: Gel electrophoresis and elution are two important processes.
- Statement B: After staining with ethidium bromide it has to be exposed to U.V. light
- Both A and B are correct statements
 - Only A is correct and B is not correct
 - Only A is correct
 - Only B is correct

ANSWER KEYS

1. (c)	2. (a)	3. (c)	4. (b)	5. (d)	6. (G)	7. (c)	Q8. (b)	9. (d)	10. (a)
11. (b)	12. (b)	13. (d)	14. (a)	15. (d)	16. (d)	17. (a)	18. (c)	19. (b)	20. (d)
21. (b)	22. (c)	23. (a)	24. (b)	25. (c)	26. (c)	27. (G)	28. (b)	29. (c)	30. (b)
31. (b)	32. (d)	33. (a)	34. (a)	35. (c)	36. (c)	37. (b)	38. (c)	39. (d)	40. (d)
41. (a)	42. (a)	43. (d)	44. (a)	45. (G)	46. (c)	47. (c)	48. (b)	49. (c)	50. (a)
51. (a)	52. (c)	53. (a)	54. (b)	55. (d)	56. (d)	57. (a)	58. (b)	59. (c)	60. (a)