

## K-CET EXAMINATION – 2024

### BIOLOGY – B-3 with Key & Solutions

1. The water potential of pure water is  
(A) One (B) More than one  
(C) Zero (D) Less than zero

Ans. (C)

Sol. The water potential of pure water is Zero.

2. Match the pigment given in List I with their colour in chromatogram given in List II

**List I**  
(Pigments)

1. Chlorophyll 'b'  
2. Carotenoids  
3. Chlorophyll 'a'  
4. Xanthophylls

**List II**  
(Colour in chromatogram)

- p. Yellow orange  
q. Orange red  
r. Yellow  
s. Blue green  
t. Yellow green

Choose the correct option from the following:

- (A) 1-s, 2-t, 3-r, 4-q  
(B) 1-t, 2-p, 3-s, 4-r  
(C) 1-p, 2-q, 3-r, 4-t  
(D) 1-t, 2-p, 3-r, 4-s

Ans. (B)

Sol. Matching:- 1-t, 2-p, 3-s, 4-r

3. Which is the intermediate compound that links the end product of Glycolysis with TCA cycle?  
(A) Acetyl CoA (B) Pyruvic Acid  
(C) OAA (D) Bolting

Ans. (A)

Sol. Acetyl CoA is the intermediate compound that links the end product of Glycolysis with TCA cycle

4. Auxins : Apical dominance : : Gibberellins : \_\_\_\_\_.  
(A) Adventitious shoot formation  
(B) Accelerates abscission  
(C) Closure of stomata  
(D) Bolting

Ans. (D)

Sol. Auxins : Apical dominance : : Gibberellins : Bolting

5. The term Uremia refers to  
(A) Accumulation of Urea in blood  
(B) Presence of Glucose in the urine  
(C) Accumulation of Uric acid in blood  
(D) Accumulation of Uric acid in kidneys

Ans. (A)

Sol. Renal failure leads to accumulation of urea in blood.

6. The typical 'lub-dub' sound heard during heartbeat are produced due to  
(A) Closure of semilunar valves  
(B) Closure of bicuspid and tricuspid valves  
(C) Closure of bicuspid and tricuspid valves followed by semilunar valves  
(D) Opening of bicuspid and tricuspid valves followed by semilunar valves

Ans. (C)

Sol. The typical 'lub' sound is produced during initiation of ventricular systole by closure of bicuspid and tricuspid valves.

The typical 'dub' sound is produced during initiation of ventricular diastole by closure of semilunar valves.

7. The functional unit of contraction is a  
(A) Portion of myofibril between two successive Z – lines  
(B) Portion of myofibril between two successive M – lines  
(C) Centre of the H – zone  
(D) Centre of the I – band

Ans. (A)

Sol. The functional unit of contraction is a Sarcomere which lies between two successive Z – lines.

8. Match the parts of the brain given in List I with their functions given in List II

**List I**  
(Parts of the brain)

1. Medulla oblongata  
2. Hypothalamus  
3. Cerebral cortex  
4. Limbic system

**List II**  
(Functions)

- p. Body temperature  
q. Olfaction  
r. Respiration  
s. Motor function

Choose the correct option from the following

- (A) 1-p, 2-r, 3-s, 4-q  
(B) 1-q, 2-s, 3-r, 4-p  
(C) 1-s, 2-p, 3-q, 4-r  
(D) 1-r, 2-p, 3-s, 4-q

Ans. (D)

Sol. Matching:- 1-r, 2-p, 3-s, 4-q

9. Hydra reproduces asexually by producing  
(A) Zoospores (B) Conidia  
(C) Buds (D) Gemmule

Ans. (C)

Sol. Hydra reproduces asexually by producing buds

10. When male and female gametes are morphologically distinct, the conduction is known as
- (A) Homogametes  
(B) Heterogametes  
(C) Hermaphrodites  
(D) Sexual Dimorphism

Ans. (B)

Sol. The male and female gametes are morphologically distinct, the conduction is known as Heterogametes

11. The role of Filiform apparatus in synergids is to
- (A) Protect the egg apparatus  
(B) Endosperm formation  
(C) Guide the entry of pollen tube  
(D) Prevention of gamete entry

Ans. (C)

Sol. The role of Filiform apparatus in synergids is to Guide the entry of pollen tube

12. Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called
- (A) Xenogamy  
(B) Autogamy  
(C) Cleistogamy  
(D) Geitonogamy

Ans. (D)

Sol. Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called Geitonogamy

13. Match the content of list I with List II

List – I	List – II
1. Polyembryony	p. Black pepper
2. Perisperm	q. Banana
3. False fruit	r. Lemon
4. Parthenocarpy	s. Apple

Choose the correct option from the following

- (A) 1-r, 2-p, 3-s, 4-q  
(B) 1-p, 2-r, 3-s, 4-q  
(C) 1-q, 2-p, 3-s, 4-r  
(D) 1-r, 2-s, 3-p, 4-q

Ans. (A)

Sol. 1-r, 2-p, 3-s, 4-q

14. Which of the following hormones is not secreted by human placenta?
- (A) Progesterone (B) hCG  
(C) Estrogen (D) LH

Ans. (D)

Sol. LH is produced and released by Anterior pituitary

15. In human females, the endometrium of uterus consists of
- (A) Smooth muscle (B) Glandular layer  
(C) Adipose layer (D) Cartilaginous layer

Ans. (B)

Sol. Endometrium is the inner layer of uterus which is glandular.

16. If two primary spermatocytes and two primary oocytes undergo meiosis simultaneously, what will be the ratio of spermatozoa and ova produced at the end of gametogenesis?
- (A) 2 : 1 (B) 4 : 1  
(C) 6 : 2 (D) 1 : 2

Ans. (B)

Sol. 1 Primary spermatocyte produces – 4 sperms  
1 Primary oocyte produces – 1 egg  
2 Primary spermatocytes produces – 8 sperms  
2 Primary oocytes produces – 2 eggs  
Ratio of sperm and egg is  $8 : 2 = 4 : 1$

17. The Government of India legalized MTP with some strict regulations in the year
- (A) 1951 (B) 1961  
(C) 1971 (D) 2001

Ans. (C)

Sol. The Government of India legalized MTP in 1971

18. The process in which a small part of the vas deferens is removed or tied up through a small incision, is called
- (A) MTP (B) Vasectomy  
(C) Tubectomy (D) GIFT

Ans. (B)

Sol. The process in which a small part of the vas deferens is removed or tied up through a small incision, is called Vasectomy.

19. Test cross in Pea plant is
- (A) A cross between  $F_2$  tall plant and recessive parent  
(B) A cross between  $F_2$  dwarf plant and recessive parent  
(C) A cross between  $F_2$  tall plant with dominant parent  
(D) A cross between two  $F_1$  plants

Ans. (A)

Sol. Test cross in Pea plant is A cross between  $F_2$  tall plant and recessive parent

20. The genotype ratio of incomplete dominance is
- (A) 3 : 1 (B) 1 : 2 : 1  
(C) 1 : 1 : 2 (D) 9 : 3 : 3 : 1

Ans. (B)

Sol. The genotype ratio of incomplete dominance is 1 : 2 : 1

21. Find the incorrect statement among the following:
- (A) In Sex linked recessive traits the gene is transmitted from unaffected carrier female to some of male progeny  
(B) Accumulation of phenylpyruvic acid in brain results in mental retardation  
(C) Individuals affected by Down's Syndrome will have congenital heart defect and are more intelligent  
(D) Turner's Syndrome is caused due to the absence of one X-chromosome

Ans. (C)

Sol. Down's Syndrome affected child has Low Intelligent

22. In a dihybrid cross between a true breeding round yellow seeded and true breeding wrinkled green seeded pea plant, the ratio of segregation of round and wrinkled seed traits in  $F_2$  is

- (A) 9 : 1  
(B) 3 : 1  
(C) 9 : 3  
(D) 3 : 3

Ans. (B)

Sol. In a dihybrid cross between a true breeding round yellow seeded and true breeding wrinkled green seeded pea plant, the ratio of segregation of round and wrinkled seed traits in  $F_2$  is 3 : 1.

23. Following representations P, Q and R denote few steps of Griffith Experiment. Identify the correct one(s).

P. R strain → Inject into → mice Mice die

Q. S strain (Heat killed) → Inject into mice → Mice die

R. R strain → Inject into mice → Mice live

- (A) P only (B) R only  
(C) P and R (D) Q and R

Ans. (B)

Sol. R strain → Inject into → mice Mice live

S strain (Heat killed) → Inject into mice → Mice live

24. In tRNA the region that binds with mRNA is

- (A) Anticodon loop of tRNA.  
(B) Amino acid acceptor end of tRNA  
(C) Amino acyl synthetase loop of tRNA  
(D) Ribosomal binding loop of tRNA.

Ans. (A)

Sol. In tRNA the region that binds with mRNA is Anticodon loop of tRNA.

25. The mRNA has Untranslated Regions (UTRS)

- (A) At 3'-end beyond Terminator codon  
(B) At 5'-end before AUG  
(C) At both 3'-end and 5'-end beyond Terminator codon and before AUG respectively.  
(D) AUG and Terminator codon flanks the UTR

Ans. (C)

Sol. The mRNA has Untranslated Regions (UTRS) at both 3'-end and 5'-end beyond Terminator codon and before AUG respectively.

26. In Structural gene, the template DNA strand has nucleotide sequences

$3' - \text{ATGCATGCATGCATGC} - 5'$ . Find the correct and complimentary nucleotide sequence on coding strand

- (A)  $5' - \text{ATGCATGCATGCATGC} - 3'$   
(B)  $3' - \text{GCATGCATGCATGCAT} - 5'$   
(C)  $5' - \text{TACGTACGTACGTACG} - 3'$   
(D)  $3' - \text{TACGTACGTACGTACG} - 5'$

Ans. (C)

Sol. In Structural gene, the template DNA strand has nucleotide sequences

$3' - \text{ATGCATGCATGCATGC} - 5'$ . Find the correct and complimentary nucleotide sequence of coding strand is  $5' - \text{TACGTACGTACGTACG} - 3'$

27. Read the following statements:

**Statement I:** All vertebrates develop a row of vestigial gill slits during embryonic stage.

**Statement II:** Embryos always pass through the adult stages of other animals.

Which of the following options is correct with reference to these statements?

- (A) Statement I is correct, Statement II is incorrect  
(B) Statement I is incorrect, Statement II is correct  
(C) Both Statements I and II are correct.  
(D) Both Statements I and II are incorrect

Ans. (A)

Sol. Embryos never pass through the adult stages of other animals.

28. Stanley Miller simulated the conditions of pre-biotic earth using spark-discharge apparatus. Which organic compounds were observed by him on analyzing the end product of his experiment?

- (A) Pigments  
(B) Fats  
(C) Nitrogen bases  
(D) Amino acids

Ans. (D)

Sol. Amino acids are formed

29. Most ape-like ancestral primate was

- (A) Dryopithecus  
(B) Ramapithecus  
(C) Australopithecus  
(D) Neanderthal man

Ans. (A)

Sol. Dryopithecus is more ape-like

30. The principle of vaccination is based on which property of immune system?

- (A) Memory  
(B) Specificity  
(C) Diversity  
(D) Plasticity

Ans. (A)

Sol. Vaccination is based on memory

31. Genome of HIV replicates in the macrophages with the help of an enzyme called

- (A) DNA Polymerase  
(B) RNA Polymerase  
(C) Reverse Transcriptase  
(D) DNA Ligase

Ans. (C)

Sol. Reverse Transcriptase enzyme converts. Viral RNA to Viral DNA

32. Read the following statements:

**Statement I:** Morphine is obtained by acetylation of Heroin

**Statement II:** Cannabinoids are known for their effect on cardiovascular system

Which of the following options is correct with reference to these statements?

- (A) Both statements I and II are correct
- (B) Statement I is correct and statement II is incorrect
- (C) Statement I is incorrect and statement II is correct
- (D) Both statements I and II are incorrect

Ans. (C)

Sol. Heroin is formed by acetylation of morphine

33. Mule is the result of

- (A) Out crossing
- (B) Cross-breeding
- (C) Interspecific hybridization
- (D) Out –breeding

Ans. (C)

Sol. Mule is the result of Interspecific hybridization

34. Identify the bacterial disease among the following

- (A) Brown rust of wheat
- (B) Tobacco mosaic disease
- (C) Black rot of crucifers
- (D) Late blight of potato

Ans. (C)

Sol. Black rot of crucifers is the bacterial disease.

35. Match the nutrients given in list I with the source in list II :

**List – I**

- 1. Vitamin A
- 2. Single cell protein
- 3. Vitamin C
- 4. Protein

**List – II**

- p. Bitter gourd
- q. Beans
- r. Carrots
- s. Spirulina spp

Choose the correct option from the following

- (A) 1–p, 2–q, 3–r, 4–s
- (B) 1–r, 2–s, 3–p, 4–q
- (C) 1–p, 2–r, 3–s, 4–q
- (D) 1–q, 2–s, 3–p, 4–r

Ans. (B)

Sol. Matching:– 1–r, 2–s, 3–p, 4–q

36. The chemical substances which are produced by some microbes which can kill or retard the growth of other microbes are known as

- (A) Statins
- (B) Streptokinases
- (C) Cyclosporins
- (D) Antibiotics

Ans. (D)

Sol. The chemical substances which are produced by some microbes which can kill or retard growth of other microbes are known as Antibiotics

37. Select the correct statement from the following:

- (A) Methanobacterium is an aerobic bacteria found in the rumen of cattle.
- (B) Biogas is produced by the activity of aerobic bacteria.
- (C) Biogas is pure methane.
- (D) Activated sludge in sediment tanks is a rich source of aerobic bacteria.

Ans. (D)

Sol. (A) Methanobacterium is an anaerobic bacteria found in the rumen of cattle.

- (B) Biogas is produced by the activity of anaerobic bacteria.
- (C) Biogas is mixer of methane and CO<sub>2</sub> and H<sub>2</sub>.

38. Which of these enzymes is required to cleave a plasmid?

- (A) Ligase
- (B) Endonuclease
- (C) Exonuclease
- (D) Polymerase

Ans. (B)

Sol. Endonuclease enzyme is required to cleave a plasmids

39. DNA polymerase of thermus aquaticus is

- (A) Thermolabile
- (B) Thermophobic
- (C) Exonuclease
- (D) Thermostable

Ans. (D)

Sol. DNA polymerase of thermus aquaticus is Thermostable

40. If a recombinant DNA bearing gene for resistance to ampicillin is transferred into *E. coli* cells, host cells become transformed into ampicillin resistant cells. What happens when these *E. coli* are grown on medium containing ampicillin?

- (A) Non – transformants will grow and transformants will die.
- (B) Non – transformants will die and transformants will grow
- (C) Both non – transformants and transformants will die.
- (D) Both non – transformants and transformants will grow.

Ans. (B)

Sol. If a recombinant DNA bearing gene for resistance to ampicillin is transferred into *E. coli* cells, host cells become transformed into ampicillin resistant cells. When these *E. coli* are grown on medium containing ampicillin Non– transformants will die and transformants will grow.

41. Which of the following is based upon the principle of antigen – antibody interaction?

- (A) PCR
- (B) ELISA
- (C) rDNA technology
- (D) Gel Electrophoresis

Ans. (B)

Sol. ELISA is based on upon the principle of antigen – antibody interaction

42. Which among the following is used to treat Emphysema?

- (A) Human Hormone –  $\alpha$  – Antitrypsin  
 (B) Human  $\alpha$  – Interferon  
 (C) Human Protein –  $\alpha$  – Antitrypsin  
 (D) Human  $\alpha$  – Lactalbumin

Ans. (C)

Sol. Human Protein –  $\alpha$  1– Antitrypsin used to treat Emphysema

43. Homeostasis is a condition where the organisms

- (A) Maintain a constant internal environment in an everchanging external environment  
 (B) Do not maintain a constant internal environment  
 (C) Change their internal environment according to their external environment  
 (D) Change their internal environment when the external environment is constant

Ans. (A)

Sol. Homeostasis is a condition where the organisms maintain a constant internal environment in an everchanging external environment

44. Which of the following is **not** a parasitic adaptation?

- (A) Loss of unnecessary sense organs  
 (B) Absence of adhesive organs or suckers  
 (C) Loss of digestive system  
 (D) High reproductive capacity

Ans. (B)

Sol. Presence of adhesive organs or suckers.

45. Match the type of adaptation given in List I with their examples given in List II. Select the option showing correct combination.

List I (Type of adaptation)	List II (Examples)
1. Biochemical adaptation	p. Desert lizards
2. Behavioural adaptation	q. Deep sea fishes
3. Physiological adaptation	r. Opuntia
4. Morphological adaptation	s. Kangaroo rats

(A) 1-q, 2-r, 3-s, 4-p  
 (B) 1-p, 2-q, 3-r, 4-s  
 (C) 1-q, 2-p, 3-s, 4-r  
 (D) 1-s, 2-r, 3-q, 4-p

Ans. (C)

Sol. 1-q, 2-p, 3-s, 4-r

46. The annual net primary productivity of the biosphere is approximately

- (A) 170 billion tons (B) 55 billion tons  
 (C) 170 million tons (D) 55 million tons

Ans. (A)

Sol. The annual net primary productivity of the biosphere is approximately 170 billion tons

47. The natural reservoir of phosphorus is

- (A) Rocks  
 (B) Soil pollution  
 (C) Detritus  
 (D) Atmosphere

Ans. (A)

Sol. The natural reservoir of phosphorus is Rocks.

48. The sequence of communities of primary succession in water is

- (A) Phytoplanktons → Scrubs → Free floating hydrophytes → Rooted hydrophytes → Grasses → Trees  
 (B) Phytoplanktons → Free floating hydrophytes → Rooted hydrophytes → Trees → Scrubs  
 (C) Free floating hydrophytes → Scrubs → Phytoplanktons → Rooted hydrophytes → Grasses → Trees  
 (D) Phytoplanktons → Rooted hydrophytes → Free floating hydrophytes → Reed swamps → Marsh meadows → Scrubs → Trees

Ans. (D)

Sol. The sequence of communities of primary succession in water is

Phytoplanktons → Rooted hydrophytes → Free floating hydrophytes → Reed swamps → Marsh meadows → Scrubs → Trees

49. A strict protection of biodiversity hotspots could reduce the ongoing mass extinction by almost

- (A) 20% (B) 25%  
 (C) 30% (D) 35%

Ans. (C)

Sol. 30%

50. Identify the incorrect match with respect to recently extinct animals and their place of extinction according to IUCN Red list.

- (A) Dodo – Mauritius  
 (B) Quagga – Africa  
 (C) Thylacine – Australia  
 (D) Steller's Sea Cow – North America

Ans. (D)

Sol. Steller's Sea Cow – Russia

51. According to the hypothesis proposed by environmental biologists, a relatively constant environment in tropics promotes

- (A) Niche specialization and lesser species diversity  
 (B) Niche specialization and greater species diversity  
 (C) Niche diversity and lesser species specialization.  
 (D) Niche diversity and greater species specialization.

Ans. (B)

Sol. According to the hypothesis proposed by environmental biologists, a relatively constant environment in tropics promotes Niche specialization and greater species diversity.

52. In the prevention of air pollution, the role of scrubber is to remove
- Particulate  $\text{SO}_2$
  - Liquid  $\text{SO}_2$
  - Gaseous  $\text{SO}_2$
  - Liquid  $\text{SO}_3$

Ans. (C)

Sol. In the prevention of air pollution, the role of scrubber is to remove Gaseous  $\text{SO}_2$ .

53. Match List I with List II and choose the correct answer:

**List I**

**List II**

- |                              |                      |
|------------------------------|----------------------|
| 1. Nitrogen rich fertilizers | p. Ozone depletion   |
| 2. Carbon dioxide            | q. Eutrophication    |
| 3. Carbon monoxide           | r. Greenhouse effect |
| 4. CFCs                      | s. Air pollutant     |

- 1-p, 2-q, 3-r, 4-s
- 1-q, 2-r, 3-s, 4-p
- 1-r, 2-s, 3-p, 4-q
- 1-s, 2-p, 3-q, 4-r

Ans. (B)

Sol. Matching:– 1-q, 2-r, 3-s, 4-p

54. Which of the following exhibits haplo-diplontic lifecycle?

- Fucus
- Chlamydomonas
- Gelidium
- Ectocarpus

Ans. (D)

Sol. Ectocarpus and kelps exhibits haplo-diplontic lifecycle.

55. Identify the phylum which shows the following characteristics

- Animals are exclusively marine, radially symmetrical and diploblastic.
- Body bears eight external rows of ciliated comb plates which help in locomotion.
- Digestion is both extracellular and intracellular.
- Reproduction only by sexual modes.

- Coelenterata
- Mollusca
- Arthropoda
- Ctenophora

Ans. (D)

Sol. The given characters belongs to the phylum Ctenophora.

56. When a flower has both stamens and carpels it is described as

- Asexual
- Unisexual
- Bisexual
- Dioecious

Ans. (C)

Sol. When a flower has both stamens and carpels it is described as bisexual.

57. Ciliated epithelial cells are present in

- Kidneys
- Intestines
- Blood Vessels
- Bronchioles

Ans. (D)

Sol. Ciliated epithelial cells are present in bronchioles which helps in flushing out of dust particles.

58. Which of the following statements is correct with reference to vacuoles?

- It is membrane bound and contains storage proteins and lipids
- It is membrane bound and contains water and excretory substances
- It lacks membrane and contains air
- It lacks membrane and contains water and excretory substances

Ans. (B)

Sol. It is membrane bound and contains water and excretory substances.

59. Exoskeleton of Arthropods is made up of unique complex polysaccharide known as

- Hyaluronic Acid
- Chitin
- Waxes
- Cellulose

Ans. (B)

Sol. Exoskeleton of Arthropods is made up of unique complex polysaccharide known as Chitin.

60. The enzyme Recombinase is required at which stage of Meiosis I?

- Pachytene
- Zygotene
- Diplotene
- Diakinesis

Ans. (A)

Sol. The enzyme Recombinase is required at Pachytene stage of Meiosis I.