KCET – 2023 TEST PAPER WITH ANSWER KEY
(HELD ON SATURDAY 20TH MAY 2023)

BIOLOGY

1. Which of the following is abbreviated as ZIFT?

(A) Zygote Intra Fallopian Tube
(B) Zygote Intra Fallopian Transfer
(C) Zygote Inter Fallopian Tube
(D) Zygote Inter Fallopian Transfer

Ans. B

2. An example for hormone releasing IUD is

(A) Lippes loop
(B) LNG - 20
(C) Implant
(D) Multiload 375

Ans. B

3. MTPs are considered relatively safe during

(A) 180 days of pregnancy
(B) Second trimester
(C) First trimester
(D) 24 weeks of pregnancy

Ans. C

4. Which of the following statements is corret?

(A) Sickle cell anaemia is a quantitative problem.
(B) Thalassemia is a qualitative problem.
(C) Female carrier for haemophilia may transmit the disease to sons.
(D) Change in whole set of chromosomes is called aneuploidy.

Ans. C

5. 'Gene-mapping' technology was developed by

(A) Sturtvent
(B) Tschermak
(C) Mendel
(D) Correns

Ans. A

6. Find the correct statement.

(1) Generally a gene regulates a trait, but sometimes one gene has effect on multiple traits.
(2) The trait AB-blood group of man is regulated by one dominant allele and another recessive allele. Hence it is co-dominant.

(A) Both Statements (1) and (2) are correct.
(B) Statement (1) is correct.
(C) Both the Statements are wrong.
(D) Statement (2) is correct.

Ans. B

7. From the following table, select the option that correctly characterizes various phases of menstrual cycle :

	Menstruation phase	Follicular phase	Luteal phase
(A)	Menses	L.H. Surge	Regenration of endometrium
(B)	Matured follicle	Regression of corpus luteum	Ovulation
(C)	Regeneration of endometrium	High level of progesterone	Developing corpus luteum
(D)	Menses	Developing corpus luteum	Follicle maturation

Ans. A

8. In one of the hybridisation experiments, a homozygous dominant parent and a homozygous recessive parent are crossed for a trait. (Plant shows Medelian inheritance pattern)

(A) Dominant parent trait appears in F_1 generation and recessive parent trait appears in F_1 and F_2 generations.

(B) Dominant parent trait appears in F_1 generation and recessive parent trait appears in F_2 generation.

(C) Dominant parent trait appears in F_2 generation and recessive parent trait appears only in F_1 generation

(D) Dominant parent trait appears in both F_1 & F_2 generations, recessive parent trait appears in only F_2 generation.

Ans. D

9. Histone proteins are positively charged because they are rich in basic amino acid residues

(A) Arginine and Phenylalanine (B) Arginine and Alanine

(C) Arginine and Proline (D) Arginine and Lysine

Ans. D

10. Eukaryotic genes are monocistronic but they are split genes because

(A) Exons are interrupted by Introns. (B) They contain Exons only.

(C) Introns are interrupted with Mutons. (D) They contain Introns only.

Ans. A

11. The Lac-Operon model was elucidated by

(A) Hershey and Chase (B) Watson and Crick

(C) Jacob and Crick (D) Francois Jacob and Jaques Monad

Ans. D

12. Which of these is NOT an example for Adaptive radiation?

(A) Placental mammals (B) Darwin's finches

(C) Long-necked Giraffe (D) Australian marsupials

Ans. C

13. In a population of 800 rabbits showing Hardy-Weinberg equilibrium, the frequency of recessive individuals was 0.16. what is the frequency of heterozygous individuals?

(A) 0.84 (B) 0.4

(C) 0.36 (D) 0.48

Ans. D

14. In male heterogametic type of sex determination

(A) Male parent produces dissimilar gametes. (B) Male parent produces similar gametes.

(C) Males do not produce gametes. (D) Female parent produces dissimilar gametes.

Ans. A

15. Identify the symptoms of pneumonia.

(A) Constipation, Abdominal pain, cramps, blood clots

(B) Difficulty in breathing, fever, chills, cough, headache

(C) High fever, weakness, stomach pain, loss of appetite

(D) Nasal congestion and discharge, cough, sore throat, headache

Ans. B

16. THe variety of Okra, Pusa Sawani is resistant to which of the following insect pests?

(A) Shoot & Fruit borer (B) Aphids

(C) Cereal leaf beetle (D) Jassids

Ans. A

17. With respect to Inbreeding, which among the following is not true?

(A) It helps in elimination of less desirable genes.

(B) Inbreeding decreases homozygosity.

(C) It helps to evolve a pure line in an animal.

(D) It helps in accumulation of superior genes.

Ans. B

18. Identify from the following a pair of better yielding semi dwarf varieties of rice developed in India.

(A) Jaya and Kalyan Sona (B) Jaya and Ratna

(C) Kalyan Sona and Sonalika (D) Sonalika amd Ratna

Ans. B

19. In MoET technique fertilized eggs are transferred into surrogate mother in which of the following stage?

(A) 8-32 celled stage (B) 2-4 celled stage

(C) 16-32 celled stage (D) 8-16 celled stage

Ans. A

20. Roquefort cheese is ripened by

(A) Virus (B) Bacterium

(C) Yeast (D) Fungi

Ans. D

21. Four students were assigned a science project to find out the pollution levels of lakes in their surrounding. AFter analysing the quality of water samples, the BOD values were found as follows :
Which among the following water samples is highly polluted?

(A) 6 mg/L (B) 0.6 mg/L (C) 0.16 mg/L (D) 0.06 mg/L

Ans. A

22. The toxic substance 'haemozoin' responsible for high fever and chill, is released in which of the following diseases?

(A) Malaria (B) Dengue

(C) Typhoid (D) Pneumonia

Ans. A

23. Which of these is NOT a method to make host cells 'component' to take up DNA?

(A) Biolistics (B) Micro-injection

(C) Use of disarmed pathogen vectors (D) Elution

Ans. D

24. Select the correct statement from the following :
(A) The first step in PCR is heating which is used to separate both the strands of gene of interest.
(B) Genetic engineering works only on animals and not yet successfully used on plants.
(C) DNA from one organism will not band to DNA from other organism.
(D) There are no risk factors associated with r-DNA technology.

Ans. A

25. Choose the incorrect statement with reference to Kangaroo rat.
(A) Uses minimal water to remove excretory products.
(B) Found in North American desert.
(C) Eliminates dilute urine.
(D) Meets is water requirements through internal fat oxidation.

Ans. C

26. Generally, bears avoid winter by undergoing
(A) Aestivation
(B) Diapause
(C) Migration
(D) Hibernation

Ans. D

27. Match Column - I with Column - II. Select the option with correct combination.

Column - I		Column - II	
1	Standing state	p.	Mass of living material at a given time.
2	Pioneer species	q.	Amount of nutrients in the soil at a given time.
3	Detritivores	r.	Species that invade a bare area.
4	Standing crop	s.	Breakdown detritus into smaller particles.

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

Ans. A

28. PCR is used for
(A) DNA digestion
(B) DNA isolation
(C) DNA amplification
(D) DNA ligation

Ans. C

29. The toxic heavy metals from various industries which cause water pollution, normally have a density
(A) more than $7.5\ g/cm^3$
(B) more than $5\ g/cm^3$
(C) more than $12.5\ g/cm^3$
(D) more than $15\ g/cm^3$

Ans. B

30. Identify the correct option showing the relative contribution of different green house gases to the total global warming.
(A) $CFC-6\%, CO_2-60\%, Methane-20\%, N_2O-14\%$
(B) $CFC-14\%, CO_2-60\%, Methane-20\%, N_2O-6\%$
(C) $CFC-14\%, CO_2-60\%, Methane-6\%, N_2O-20\%$
(D) $CFC-20\%, CO_2-60\%, Methane-14\%, N_2O-6\%$

Ans. B

31. A flower has 10 stamens each having bilobed dithecous anther. If each microsporangium has 5 pollen mother cells, how many pollen grains would be produced by the flower?
(A) 800 (B) 200 (C) 1600 (D) 400

Ans. A

32. During transcription the DNA stand with $3' \rightarrow 5'$ polarity of the structural gene always acts as a template because
(A) Enzyme DNA dependent RNA polymerase always catalyse polymerisation in bioth the directions.
(B) Enzyme DNA dependent RNA polymerase always catalyse the polymerisation $5' \rightarrow 3'$ directions.
(C) Nucleotides of DNA strand with $5' \rightarrow 3'$ are transferred to mRNA.
(D) Enzyme DNA dependent RNA polymerase always catalyse the polymerisation $3' \rightarrow 5'$ directions.

Ans. B

33. According to David Tilman's long term ecosystem experiments, the total biomass in plots with more species shows,
(A) Average variation from year-to-year. (B) Less variation from year-to-year.
(C) No variation from year-to-year. (D) High variation from year-to-year.

Ans. B

34. Identify the incorrect statement regarding the flow of energy between various components of the food chain.
(A) Green plants capture about 10% of the solar energy that falls on leaves.
(B) The amount of energy available at each trophic level is 10% of previous trophic level.
(C) Each trophic level loses some energy as heat to the environment.
(D) Energy flow is unidirectional.

Ans. A

35. Find out the correct match.

	Disease	Pathogen	Main organ affected
(A)	Filariasis	Common round worm	Small intestine
(B)	Ringworm	Fungus	Skin
(C)	Dysentery	Protozoa	Liver
(D)	Typhoid	Bacteria	Lungs

Ans. B

36. Match the following columns and choose the correct option :

	Column - I		Column - II
1.	Haemophilus influenzae	p.	Malignant malaria
2.	Entamoeba histolytica	q.	Elephantiasis
3.	Plasmodium falciparum	r.	Pneumonia
4.	Wuchereria bancrofti	s.	Amoebiasis

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

Ans. D

37. From the following tools / techniques of genetic engineering, identify those which are required for cloning a bacterial gene in animal cells and choose the correct option :

I. Endonuclease II. Ligase
III. A. tumefaciens IV. Microinjection
V. Gene gun VI. Lysozyme
VII. Cellulase VIII. Electrophoresis

(A) I, III, IV, V, VII
(B) II, III, V, VII, VIII
(C) II, III, IV, VI, VII, VIII
(D) I, II, IV, VI, VIII

Ans. D

38. Match the column-I with column-II and choose the correct option from the following :

Column - I (Plant groups)	**Column - II (Examples)**
1. Bryophyta	p. Pinus
2. Gymnosperm	q. Adiantum
3. Algae	r. Sphagnum
4. Pteridophyta	s Ectocarpus

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

Ans. D

39. Flame cells present in the members of platyhelminthes are specialized to perform,

(A) Respiration and Excretion
(B) Osmoregulation and Circulation
(C) Respiration and Osmoregulation
(D) Osmoregulation and Excretion

Ans. D

40. Identify the floral formula of plant belonging to potato family.

(A) $\overset{\circ}{\underset{+}{\delta}}, P_{3+3}, A_{3+3}, G_{(3)}$

(B) $\overset{\circ}{\underset{+}{\delta}}, K_{(5)}, \overset{\frown}{C_{(5)}A_5}, \underline{G}_{(2)}$

(C) $\overset{\circ}{\underset{+}{\delta}}, K_{(5)}, C_{(5)}, A_{(9)+1}, G_1$

(D) $\overset{\circ}{\underset{+}{\delta}}, K_{10}, C_{10}, A_{10}, \bar{G}_2$

Ans. B

41. When the vascular cambium is present between the xylem and phloem, then the vascular bundle is called

(A) Endarch
(B) Exarch
(C) Closed
(D) Open

Ans. D

42. The function of Typhlosole in earthworm is

(A) Transportation

(B) Grinding of soil particles

(C) Increasing the effective area of absorption in the intestine

(D) Grinding of decaying leaves

Ans. C

43. Select the correctly matched pair of organisms with their order.

(A) Homo, sapiens : Poales

(B) Triticum, aestivum : Sapindales

(C) Mangifera, indica : Primata

(D) Musa, domestica : Diptera

Ans. D

44. Match List-I and List-II with respect to proteins and their functions and select the correct option.

	List - I		**List - II**
1.	Collagen	p.	Fights infectious agents
2.	Trypsin	q.	Hormone
3.	Insulin	r.	Enzyme
4.	Antibody	s.	Intercellular ground substance

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

(B) 1-q, 2-r, 3-q, r-s

(C) 1-s, 2-p, 3-r, 4-p

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

Ans. A

45. The complex formed by a pair of synapsed homologous chromosomes is called,

(A) Bivalent

(B) Pentavalent

(C) Univalent

(D) Triad

Ans. A

46. Match column-I with column-II. Select the option with correct combination.

	Column - I		**Column - II**
1.	Hypertonic	p.	Two molecules move in the same direction across the membrane.
2.	Capillarity	q.	External solution is more concentrated than cell sap.
3.	Symport	r.	Water loss in the form of droplets.
4.	Guttation	s.	Ability of water to rise in thin tubes.

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

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

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

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

Ans. C

47. Toxicity of which micronutrient induces deficiency of iron, magnesium and calcium ?

(A) Manganese

(B) Zinc

(C) Boron

(D) Molybdenum

Ans. A

48. Considering the stroke volume of an adult healthy being is 70 mL, identify the cardiac output in one hour from the following :

(A) 302.4 Lit/hour (B) 5.04 Lit/hour

(C) 50.40 Lit/hour (D) 30.24 Lit/hour

Ans. A

49. Function of contractile vacuole in Amoeba is

(A) Osmoregulation and movements (B) Excretion and osmoregulation

(C) Digestion and excretion (D) Digestion and respiration

Ans. B

50. Atrial Natriuretic Factor (ANF) acts as a

(A) Vasoconstricter (B) Check on Renin-Angiotension mechanism

(C) Hypertension inducer (D) Promoter on Renin-Angiotensiion mechanism

Ans. B

51. The vibrations from the ear drum are tansmitted through ear ossicles to

(A) Tectorial membrane (B) Cochlea

(C) Auditory nerves (D) Oval window

Ans. D

52. Bamboo species flowers

(A) Once in lifetime (B) Every year

(C) Twice in $50-100$ years (D) Once in 12 years

Ans. A

53. In Bryophyllum, the adventitious buds arise from

(A) Shoot apex (B) Leaf axil

(C) Leaf base (D) Notches in the leaf margin

Ans. D

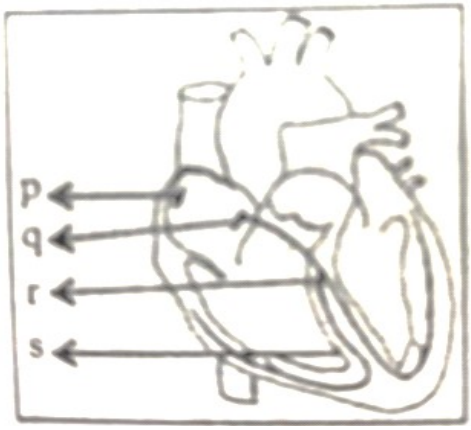
54. Primary endosperm nucleus is formed by fusion of

(A) One polar nucleus and male gamete (B) Two polar nuclei and one male gamete

(C) Two polar nuclei and two male gamete (D) Ovum and male gamete

Ans. B

55. Identify the option showing the correct labelling for p, q, r and s with reference to the conducting system of the human heart.



(A) p-Bundle of His, q-SAN, r-Interventicular septum, s-AVN
(B) p-SAN, q-AV N, r-Bundle of His, s-Interventicular septum
(C) p-Interventicular septm, q-AVN, r-Bundle of His, s-SAN
(D) p-AVN, q-SAN, r-Interventicular septum, s-Bundle of His

Ans. B

56. In the female reproductive system, a tiny finger like structure which lies at the upper junction of the two labia minora above the urethral opening is called

(A) Clitoris
(B) Hymen
(C) Vagina
(D) Mons pubis

Ans. A

57. Consider the following statements with reference to female reproductive system:

Statement 1: The presence or absence of hymen is not a reliable indicator of virginity or sexual experience

Statement 2: The sex of the foetus is determined by the father and not by the mother.

Choose the correct option from the following:

(A) Statement 1 is wrong and Statement 2 is corret
(B) Statement 1 is correct and Statement 2 is wrong
(C) Both Statement 1 and Statememt 2 are wrong
(D) Both Statement 1 and Statement 2 are correct

Ans. D

58. The male sex accessory ducts include,

(A) Rete testis, vasa efferentia, seminal vesicle and vas deferens
(B) Rete testis, vasa efferentia, epididymis and seminal vesicle
(C) Rete testis, vasa efferentia, epididymis and vas deferens
(D) Rete testis, urethra, epididymis and vas deferens

Ans. C

59. With reference to human sperm, match the List - I with List - II.

List - I		List - II	
1	Head	p	Filled with enzyme
2	Acrosome	q	Contains mitochondria
3	Middle piece	r	Sperm motility
4	Tail	s	Contains haploid nucleus

Choose the correct option from the following:

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

Ans. B

60. Which pair of the following cells in the embryo sac are destined to change their ploidy after fertilization?

(A) Central cell and antipodals
(B) Antipodals and synergids
(C) Egg cell and central cell
(D) Synergids and egg cell

Ans. C