

**KCET – 2016 TEST PAPER WITH ANSWER KEY  
(HELD ON WEDNESDAY 4<sup>th</sup> MAY, 2016)**

**BIOLOGY**

1. Identify from the following group of animals, which exhibit oestrous cycle.
- (1) Monkey, ape, man and elephant
  - (2) Lion, deer, dog and cow
  - (3) Lion, dog, monkey and ape
  - (4) Cow, monkey, elephant and ape

**Ans: (2)**

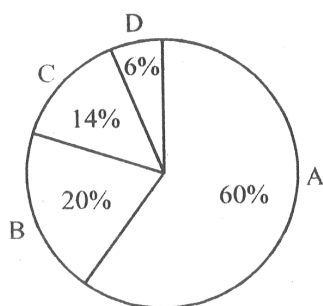
2. The codons UUU and UUC codes for phenylalanine only. This feature of genetic code is called
- (1) Degenerate
  - (2) Commaless
  - (3) Non-ambiguous
  - (4) Non-overlapping

**Ans: (1)**

3. Connell's field experiment on the rocky sea coast of Scotland, where larger Barnacle balanus dominates the intertidal area and removes the smaller Barnacle cathamalus. This happened due to
- (1) Parasitism
  - (2) Predation
  - (3) Mutualism
  - (4) Competition

**Ans: (4)**

4. The relative contribution of various green house gases to total global warming is given in the following diagram :



Identify the green house gases.

- (1) A = CFCs; B= CO<sub>2</sub> ; C= CH<sub>4</sub> ; D= N<sub>2</sub>O
- (2) A= CO<sub>2</sub> ; B= CH<sub>4</sub> ; C = CFCs; D= N<sub>2</sub>O
- (3) A = CFCs ; B = CH<sub>4</sub> ; C = CO<sub>2</sub> ; D = N<sub>2</sub>O
- (4) A= CO<sub>2</sub> ; B = CFCs; C= CH<sub>4</sub> ; D= N<sub>2</sub>O

**Ans: (2)**

5. Which among these is not a post fertilization event ?
- (1) Fruit formation
  - (2) Gametogenesis
  - (3) Seed formation
  - (4) Embryogenesis

**Ans: (2)**

6. Facultative absorption of water from primary urine is influenced by the hormone
- (1) Vasopressin
  - (2) Androgens
  - (3) Thyroxine
  - (4) Epinephrine

**Ans: (1)**

7. Digestion of proteins is incomplete in the absence of enterokinase, because
- (1) Trypsinogen is not converted into trypsin.
  - (2) Pepsinogen is not converted into pepsin.
  - (3) Prorennin is not converted into rennin.
  - (4) Chymotrypsinogen is not converted into chymotrypsin.

**Ans: (1)**

8. The puffed-up appearance of dough is due to fermentation by bacteria. Identify the gas liberated during the process.
- (1) Hydrogen sulphide
  - (2) Methane
  - (3) Ammonia
  - (4) Carbon dioxide

**Ans: (4)**

9. All the following interactions are mutualism, except
- (1) Plant and animal relation for pollination
  - (2) Association of algae and fungi in lichens
  - (3) Association of cattle egret and grazing cattle
  - (4) Association of fungi and roots of higher plants in mycorrhiza

**Ans: (3)**

10. Identify the incorrect statement from the following.

- (1) Response of T-cells is called cell mediated immunity.
- (2) B-cells produce antibody.
- (3) Macrophages are the phagocytic cells.
- (4) Interferons kill viruses.

**Ans: (4)**

11. Elution means

- (1) Making the DNA bands visible under UV radiation.
- (2) Separation of DNA fragments on agarose gel.
- (3) Isolating alien DNA from the choice organism.
- (4) Cutting and extraction of DNA bands from the agarose gel.

**Ans: (4)**

12. Choose the correct sequence of events occur in human reproduction.

- (1) Gametogenesis → insemination → fertilization → implantation → gestation → parturition
- (2) Gametogenesis → gestation → insemination → fertilization → implantation → parturition
- (3) Gestation → gametogenesis → insemination → implantation → fertilization → parturition
- (4) Gametogenesis → insemination → % gestation → implantation → fertilization → parturition

**Ans: (1)**

13. What is the role of competitive inhibitor during enzyme action ?

- (1) It alters the active site of the enzyme and prevents the binding of substrate.
- (2) It enhances enzyme action.
- (3) It inhibits breaking of chemical bonds of the substrate.
- (4) It declines the enzyme action.

**Ans: (4)**

14. In which type of interactions, both the interacting organisms do not live close together ?

- (1) Mutualism
- (2) Predation
- (3) Competition
- (4) Parasitism

**Ans: (3)**

15. Plants obtained through tissue culture are genetically identical and they are obtained by somatic cells. What do you call them ?

- (1) Somatic hybrids
- (2) Somaclones
- (3) Cross hybrids
- (4) Monoclonones

**Ans: (2)**

16. A plant is provided with ideal conditions for photosynthesis and supplied with isotope  $^{14}\text{CO}_2$ . When the products of the process are analysed carefully, what would be the nature of products ?

- (1) Both glucose and oxygen are normal.
- (2) Both glucose and oxygen are labelled.
- (3) Only glucose is labelled and oxygen is normal.
- (4) Only oxygen is labelled but glucose is normal.

**Ans: (3)**

17. Sarcomere is the functional unit of contraction in a muscle fibre. Identify the portion of myofibril that constitute a sarcomere.

- (1) The portion of myofibril between two successive 'A' band.
- (2) The portion of myofibril between two successive 'Z' line.
- (3) The portion of myofibril between two successive 'M' line.
- (4) The portion of myofibril between two successive 'I' band.

**Ans: (2)**

18. Snow blindness is caused due to

- (1) Acid rain
- (2) Ozone hole
- (3) Green house effect
- (4) Nuclear winter

**Ans: (2)**

19. In a polysaccharide, number of monosaccharides are linked by

- (1) Glycosidic bond
- (2) Peptide bond
- (3) Hydrogen bond
- (4) Phosphoester bond

**Ans: (1)**

20. Which one of these is not an accessory glands in male reproductive system ?

- (1) Cowper's gland
- (2) Prostate gland
- (3) Bartholin's gland
- (4) Seminal vesicle

**Ans: (3)**

21. In a dithecous anther, each pollen sac contain 1000 MMC. What is the total number of pollen-grains produced by the anther ?

- (1) 16,000 (2) 4,000  
(3) 32,000 (4) 8,000

**Ans: (1)**

22. Choose the incorrect statement from the following.

- (1) Adipose tissue is a type of dense connective tissue.  
(2) Tendons attach muscle to bone.  
(3) Cartilage is made up of chondrocytes.  
(4) Ciliated epithelium is the modified columnar epithelium.

**Ans: (1)**

23. What is the function of the enzyme 'recombinase' during meiosis ?

- (1) Condensation of chromosomes  
(2) Formation of synaptonemal complex  
(3) Alignment of bivalent chromosomes on equatorial plate  
(4) Crossing over between non-sister chromatids

**Ans: (4)**

24. A person admitted to hospital as he had myocardial infarction. A cardiologist injecting him 'streptokinase', why ?

- (1) It stimulates heart beat.  
(2) It reduces hypertension.  
(3) It acts as clot buster.  
(4) It reduces the level of blood cholesterol.

**Ans: (3)**

25. One of the following area is an example for secondary succession, if the succession take place in/on

- (1) Newly created pond  
(2) Abandoned farm land  
(3) Bare rock  
(4) Newly cooled lava

**Ans: (2)**

26. Desired genes have been introduced into transgenic animals to obtain large scale production of useful biological products encoded by these genes. This approach is generally referred to as

- (1) Gene therapy  
(2) Hybridoma technology  
(3) Down stream processing  
(4) Molecular farming

**Ans: (4)**

27. The edible part of the fruit of apple is

- (1) Endocarp (2) Thalamus  
(3) Involucre (4) Pericarp

**Ans: (2)**

28. Lactational amenorrhea

- (1) Prevents secretion of prolactin  
(2) Prevents secretion of milk from breast  
(3) Prevents spermatogenesis  
(4) Prevents conception

**Ans: (4)**

29. The gene for haemophilia is located on 'X' chromosome. Hence it is normally impossible for a

- (1) Carrier mother to pass the gene to her son.  
(2) Haemophilic father to pass the gene to his daughter.  
(3) Haemophilic father to pass the gene to his son.  
(4) Carrier mother to pass the gene to her daughter.

**Ans: (3)**

30. The primary treatment of sewage water involves

- (1) Anaerobic bacterial activity  
(2) Sludge digestion  
(3) Filtration and sedimentation  
(4) Aerobic bacterial activity

**Ans: (3)**

31. Which one of the following statements is not correct about a plasmid ?

- (1) It has the ability of autonomous replication.  
(2) It is a circular DNA.  
(3) Its DNA is as long as chromosomal DNA.  
(4) It has antibiotic resistant gene.

**Ans: (3)**

32. A scrubber in the exhaust of a chemical industry removes

- (1) Nitrous oxide (2) Hydrogen sulphide  
(3) Carbon monoxide (4) Sulphur dioxide

**Ans: (4)**

33. A doctor identifies symptoms of nasal congestion, headache, sore throat, hoarseness, cough in a patient. The conclusion is that, the patient is infected by a pathogen

- (1) Plasmodium (2) Adeno virus  
(3) Salmonella (4) Rhino virus

**Ans: (4)**

34. Most suitable method of introducing alien DNA into a plant cell is  
 (1) Lipofection (2) Biolistics  
 (3) Heat shock method (4) Microinjection

**Ans: (2)**

35. Some of the events occur during life cycle of Plasmodium are given below. Identify the correct statement.

- (1) Female mosquito take up sporozoites with blood meal.  
 (2) The sporozoites reproduce sexually in liver cells.  
 (3) When mosquito bites a man, gametocytes are injected.  
 (4) The gametocytes develop in RBC.

**Ans: (4)**

36. The phenomenon called 'Apical dominance' in plants is due to a phytohormone

- (1) Cytokinins (2) Auxins  
 (3) ABA (4) Gibberellins

**Ans: (2)**

37. Match the plant structures given in the column-I with their plants given in the column-II.

Column-I	Column-II
A. Prothallus	P. Bryophytes
B. Microsporophyll	q. Pteridophytes
C. Protonema	r. Angiosperms
D. PEN	s. Gymnosperms

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

**Ans: (3)**

38. Pick the hormone which is not secreted by human placenta.

- (1) Prolactin (2) hCG  
 (3) Estrogen (4) hPL

**Ans: (1)**

39. The gene disorder phenylketonuria is an example for  
 (1) Multiple allelism (2) Polygenic inheritance  
 (3) Multiple factor (4) Pleiotropy

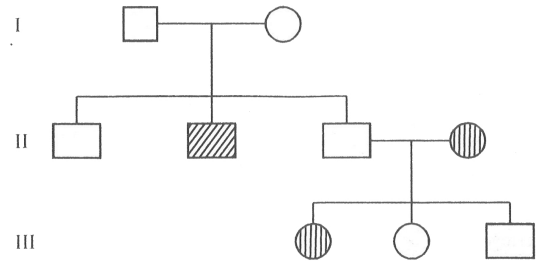
**Ans: (4)**

40. 'A' and 'B' are the two adjacent living cells. The cell 'A' has solute potential ( $\psi_s$ ) of -9 bars and pressure potential ( $\psi_p$ ) of 4 bars, whereas cell 'B' has solute potential ( $\psi_s$ ) of -8 bars and pressure potential ( $\psi_p$ ) of 5 bars. What will be the direction of water movement between these cells ?

- (1) Do not move in any direction.  
 (2) Cell A to Cell B  
 (3) Moves in both the directions.  
 (4) Cell B to Cell A

**Ans: (4)**

41. From the following pedigree chart of a family, one can make an analysis that,



- (1) It is an allosomal dominant trait.  
 (2) It is an autosomal dominant trait.  
 (3) It is an allosomal recessive trait.  
 (4) It is an autosomal recessive trait.

**Ans: (4)**

42. Find the mis-match from the following pairs :

- (1) Natural selection → Industrial melanism  
 (2) Divergent evolution → thorn of bougainvillia and tendril of cucurbita  
 (3) Genetic drift → Constant gene frequency  
 (4) Adaptive radiation → Australian marsupials

**Ans: (3)**

43. The hormone 'melatonin' is secreted by the gland

- (1) Pineal (2) Thyroid  
 (3) Pituitary (4) Adrenal

**Ans: (1)**

44. Which one of the following statement is correct ?  
 (1) Chasmogamous flowers never exhibits autogamy.  
 (2) Chasmogamous flowers always exhibits geitonogamy.  
 (3) Cleistogamous flowers exhibits both autogamy and geitonogamy.  
 (4) Cleistogamous flowers always exhibits autogamy.

**Ans: (4)**

45. In plants, lateral roots arise from  
 (1) Endodermis (2) Epidermis  
 (3) Pericycle (4) Hypodermis

**Ans: (3)**

46. Identify a micro-organism that can produces biomass of protein.  
 (1) *Methylophilus methylotrophus*  
 (2) *Monascus purpureus*  
 (3) *Trichoderma polysporum*  
 (4) *Aspergillus niger*

**Ans: (1)**

47. Identify the correct equation for Hardy-Weinberg law.  
 (1)  $(p + q)^2 = 1$  (2)  $p + q = 1$   
 (3)  $(p - q)^2 = 1$  (4)  $p - q = 1$

**Ans: (2)**

48. A population is correctly defined as having which of the following characteristics ?  
 a. Inhabiting the same geography area  
 b. Individuals belonging to same species  
 c. Possessing a constant and uniform density and dispersion  
 (1) a and c only (2) a and b only  
 (3) b only (4) b and c only

**Ans: (2)**

49. Offsprings formed during sexual reproduction exhibits more variation than those formed by asexual method, because,  
 (1) Sexual reproduction is more complicated.  
 (2) Genetic material comes from two different individuals.  
 (3) Genetic material comes from male parent.  
 (4) Greater amount of DNA is involved.

**Ans: (2)**

50. Read the following statements carefully and choose the correct statements :

- a. In a transcription unit, the promoter located at the 5' end of coding strand.  
 b. The single strand DNA having the polarity 5' → 3' is the template strand.  
 c. RNA polymerase binds to the operator during transcription.  
 d. Single base DNA differences occur in humans are called Single Nucleotide Polymorphism (SNPs).  
 (1) Statements b and d  
 (2) Statements a and b  
 (3) Statements a and d  
 (4) Statements b and c

**Ans: (3)**

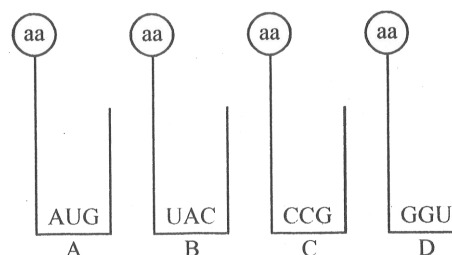
51. In a taxonomic hierarchy, the number of common characters will increase as we go from,  
 (1) Class to Order  
 (2) Species to Kingdom  
 (3) Genus to Species  
 (4) Kingdom to Species

**Ans: (4)**

52. A human male is heterozygous for autosomal genes 'A' and 'B'. He is also hemizygous for haemophilic gene 'h'. What percentage of sperms will carry 'abh' genotype ?  
 (1) 75% (2) 25%  
 (3) 0% (4) 50%

**Ans: (BONUS)**

53. Find the sequence of binding of the following aminoacyl t-RNA complexes during translation to mRNA transcribed by a DNA segment having the base sequences 3'TACATGGGTCCG5'.



Choose the answer showing the correct order of alphabets.

- (1) C, D, B, A (2) A,B,D,C  
 (3) D,C,A,B (4) B, A, D, C

**Ans: (4)**

54. Some desert beetles can survive on “metabolic water”, without ever drinking liquid water which
- (1) Is a breakdown product of pyruvate inside the mitochondria, along with carbon dioxide.
  - (2) Was produced as water in the organisms they eat.
  - (3) Is a breakdown product from glycolysis in the cytoplasm.
  - (4) Is absorbed from the air along with respiratory oxygen.

**Ans: (1)**

55. Which one of the following statement is wrong with respect to separation of DNA fragments on gel electrophoresis ?
- (1) The DNA fragments resolve according to their size.
  - (2) The DNA fragments move towards anode under electric field through the matrix.
  - (3) The smaller DNA fragments separate first.
  - (4) The commonly used matrix is agarose gel.

**Ans: (BONUS)**

56. E. coli bacteria grew in  $^{15}\text{NH}_4\text{Cl}$  medium for several generations are allowed to grow in  $^{14}\text{NH}_4\text{Cl}$  medium. After 2 generations, the bacteria are isolated from the medium and DNA of bacteria centrifuged in  $\text{CsCl}$ . The result of the density gradient of DNA is
- (1) Both heavy and light DNA
  - (2) Only hybrid DNA
  - (3) Both hybrid and light DNA
  - (4) Both hybrid and heavy DNA

**Ans: (3)**

57. Amniocentesis is one of the methods
- (1) For foetal sex determination
  - (2) Adapted for MTP
  - (3) Used for safe parturition
  - (4) Of birth control

**Ans: (1)**

58. The rate of formation of new organic matter by deer in a forest ecosystem is called
- (1) Standing crop
  - (2) Primary productivity
  - (3) Net Primary productivity
  - (4) Secondary productivity

**Ans: (4)**

59. One of the breeding techniques useful to eliminate harmful recessive genes by selection is
- (1) In-breeding
  - (2) Artificial insemination
  - (3) MOET
  - (4) Out-breeding

**Ans: (1)**

60. A person who has allergy, the type of antibody produced in his body is
- (1) IgE
  - (2) IgA
  - (3) IgM
  - (4) IgG

**Ans: (1)**