KCET – BIOLOGY – 2014

VERSION CODE: A – 1

1. Making of two varieties of a cattle breed like Red Dane which have no common ancestors on either sides of their pedigree up to 4 – 6 generations is an example for _____
   (1) Inbreeding (2) Cross breeding
   (3) Out crossing (4) Inter-specific hybridization

Ans: (3)

Inbreeding involves mating of males and females of the same breeds closely related to each other. Cross breeding involves mating of males and females of two different breeds. Inter-specific hybridization mating of males and females of two different species.

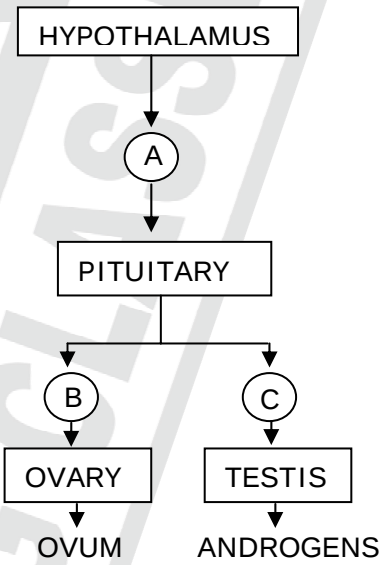
2. Identify the hormones, 'A', 'B' and 'C' that are labelled in the given flow chart:

   (1) A- GnRH, B - ICSH, C – FSH

   (2) A- GH, B - FSH, C – LH

   (3) A- GnRH, B - PRL, C – ICSH

   (4) A- GnRH, B - FSH, C – LH



Ans: (4)

3. **Statement (A):** Photorespiration decreases photosynthetic output.
   Statement (B): In photorespiratory pathway, neither ATP nor NADPH is produced.
   (1) Both the statements A and B are correct
   (2) Both the statements A and B are wrong
   (3) Statement (A) is correct and statement (B) is wrong
   (4) Statement (B) is correct and statement (A) is wrong

Ans: (1)

Photorespiration light dependent reaction in C-3 plants where oxygen is consumed and carbon dioxide is reduced.

4. Identify the incorrect statement from the following:
   (1) The reservoir pool for phosphorus cycle is earth's crust whereas atmosphere is the reservoir pool for carbon cycle.
   (2) During carbon cycle and Phosphorus cycle, there is very little respiratory release of carbon and phosphorus respectively
   (3) Atmospheric inputs of phosphorus throughout rainfall are much smaller than carbon inputs.
   (4) Gaseous exchanges of phosphorus between organism and environment are negligible.

Ans: (2)

5. The result of the following reaction/ experiment carried out by Avery et. Al. on *Streptococcus pneumoniac* has proved conclusively that DNA is the genetic material;
(1) Live 'R' strain + DNA from 'S' strain + DNAase
(2) Heat killed 'R' strain + DNA from 'S' strain + DNAase
(3) Live 'R' strain + DNA from 'S' strain + RNAase
(4) Live 'R' strain + Denatured DNA of 'S' strain + protease

Ans: (1) Live 'R' strain + DNA from 'S' strain + DNAase - 'S' strain is not formed

6. Match the storage products listed under Column – I with the organisms given under Column – II; choose the appropriate option from the given choices.

	Column – I		**Column – II**
(A)	Glycogen	**(p)**	*Sargassum*
(B)	Pyrenoids	**(q)**	*Nostoc*
(C)	Laminarin and mannitol	**(r)**	*Polysiphonia*
(D)	Floridean starch	**(s)**	*Spirogyra*
		(t)	*Agaricus*

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

Ans: (3)

7. Identify the desirable characteristics for a plasmid used in rDNA technology from the following:
A. Ability to multiply and express outside the host in a bioreactor
B. A highly active promoter
C. A site at which replication can be initiated
D. One or more identifiable marker genes
E. One or more unique restriction sites
(1) A, C and E only
(2) B, C and E only
(3) A, C, D and E only
(4) B, C, D and E only

Ans: (4)

8. Which compounds were used by Miller in his experiment for obtaining amino acids and other organic substances?
(1) Carbon dioxide, water vapour and methane
(2) Methane, ammonia, water vapour and hydrogen cyanide
(3) Ammonia, methane, hydrogen and water vapour
(4) Ammonia, methane and carbon dioxide

Ans: (3)

Stimulated reducing atmosphere is maintained by Miller and oxygen is not used in the experiment.

9. Which of the following is true for eutrophicated water body?
(1) High mineral content
(2) High oxygen content
(2) Rich species diversity
(4) Low organic content

Ans: (1)
Nutrient enrichment of water body is called eutrophication.

10. IUDs which are used by females
(1) act as spermicidal jellies
(2) block the entry of sperms into vagina
(3) are implanted under the skin and they release progestogen and estrogen
(4) release copper ions in the uterus that increase phagocytosis of sperms

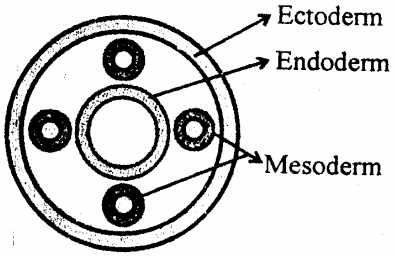
Ans: (4) Inert intrauterine devices release copper ion in the uterus that increases phagocytosis of sperms

11. Which of the following hormones are secreted in large quantities during pregnancy in women?
(1) hCG, progesterone, estradiol and FSH
(2) hCG, hPL, progesterone, estrogen and LH
(3) LH, estrogen and estradiol
(4) hCG and hPL

Ans: (4)
FSH and LH secreted by anterior pituitary, during pregnancy progesterone inhibits secretion of GnRH.

12. The kind of coelom represented in the diagram given below is characteristic of :

(1) Earthworm
(2) Cockroach
(3) Round worm
(4) Tape worm



Ans: (3)
Round worms are pseudocoelomates belong to the phylum Aschelmenthes.

13. With respect to angiosperms, identify the incorrect pair from the following :
(1) Antipodals – 2n
(2) Vegetative cell of male gametophyte – n
(3) Primary endosperm nucleus – 3n
(4) Cells of nucellus of ovule – 2n

Ans: (1)
Antipodals of embryo sac are haploid in nature.

14. **Statement A:** For a particular character in an individual, each gamete gets only one allele.
Statement B: Chromatids of a chromosome split (separate) and move towards opposite pole during anaphase of mitosis.
(1) Both the statements are correct and B is the reason for A.
(2) Both the statements are correct and B is not the reason for A.
(3) Statement (A) is correct and statement (B) is wrong
(4) Statement (B) is correct and statement (A) is wrong

Ans: (2)

Separation of factors takes place during gamete formation and during gametogenesis meiosis takes place.

15. Internal bleeding, muscular pain, blockage of the intestinal passage and anemia are some of the symptoms caused due to infection by _____

(1) *Wuchereria* (2) *Trichophyton* (3) *Ascaris* (4) *Plasmodium*

Ans: (3)

Ascaris infects intestine. *Wuchereria* causes filariasis. *Trichophyton* causes ringworm. *Plasmodium* causes malaria.

16. RNA interference which is employed in making tobacco plant resistant to *Meloidegyne incognita* is essentially involved in _____

(1) preventing the process of translation of mRNA
(2) preventing the process of transcription
(3) preventing the process of replication of DNA
(4) preventing the process of splicing of hnRNA

Ans: (1)

Biological process in which RNA molecules inhibit gene expression by causing destruction of mRNA.

17. The success of mammals on earth is largely because ;

(1) They can conform to the changes in the environment.
(2) They can reduce metabolic activity and go into a state of dormancy during unfavourable conditions in the environment.
(3) They have the ability to maintain constant body temperature.
(4) They can take care of their young ones as they have mammary glands to suckle them.

Ans: (4)

18. Which one of the following hormones also produces ant-inflammatory reactions in man and suppresses the immune response in addition to its primary functions?

(1) Cortisol (2) Thymosin (3) Thyrocalcitonin (4) Erythropoietin

Ans: (1)

It is glucocorticoid secreted by zona fasciculata of adrenal cortex.

19. Match the microbial products listed under Column-I with the related miscrobes given under Column II; choose the appropriate option from the given choices.

	Column – I		**Column – II**
(A)	Citric acid	**(p)**	*Methanobacterium*
(B)	Cyclosporin A	**(q)**	*Monascus purpureus*
(C)	Statin	**(r)**	*Aspergillus niger*
(D)	Gobar gas	**(s)**	*Trichoderma polysporum*
		(t)	*Clostridium butylicum*

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

Ans: (1)

20. *Marchantia* is considered as a heterothallic plant because it is _____
(1) Heterogametic (2) Bisexual (3) Monoecious (4) Dioecious

Ans: (4)

Marchantia is dioecious where the male plant bears Antheriodiophore, female plants bears Archegoniophore.

21. Identify the set of characteristics related to plants belonging to family Fabaceae from the following :
(1) Actinomorphic flower, syncarpous ovary and marginal placentation
(2) Persistent calyx, epipetalous stamens and leguminous fruit
(3) Papilionaceous corolla, axile placentation and leguminous fruit
(4) vexillary aestivation of corolla, diadelphous stamens and monocarpellary, unilocular ovary

Ans: (4)

Plants belonging to the family Fabaceae shows descending imbricate aestivation of corolla, stamens 10 ((9) + 1 condition) and marginal placentation.

22. One of the following statements is incorrect with reference to biodiversity. Identify it.
(1) Biodiversity increases with higher altitudes to lower altitudes
(2) Depletion in genetic diversity of crop plants is mainly due to the introduction of better varieties with high yield, disease resistance, etc.
(3) The richest reservoirs of animal and plant life (species richness) with few or no threatened species are called “biodiversity hotspots”.
(4) Biodiversity decreases from the equator to polar regions.

Ans: (1)

23. In castor and maize plants, ……
(1) autogamy is prevented but not geitonogamy
(2) both autogomy and geitonogamy are prevented
(3) male and female flowers are borne by different plants
(4) the anthers and stigma are placed at different positions to encourage cross pollination

Ans: (1)

In maize and castor flowers are unisexual. Autogamy and geitonogamy are prevented in *Carica papaya*

24. In garden pea, round shape of seeds is dominant over wrinkled shape. A pea plant heterozygous for round shape of seed is selfed and 1600 seeds produced during the cross are subsequently geminated. How many seedlings would have the parental phenotype?
(1) 1600 (2) 800 (3) 400 (4) 1200

Ans: (1)

In F2 generation total number of plants produced are 1600 (both dominant and recessive individuals)

25. Which of the following events would occur in ‘Lac-operon’ of E. coli when the growth medium has high concentration of lactose?
(1) The structural genes fail to produce polycistronic mRNA.
(2) The repressor protein binds to RNA polymerase and prevents translation.
(3) The repressor protein attaches to the promoter sequence and derepresses the operator.
(4) The inducer molecule binds to repressor protein and RNA polymerase binds to promoter sequence.

Ans: (4)

Inducer (lactose) binds to repressor proteins brings about conformational changes of repressor protein.

26. The mature infective stages of malarial parasite which are transferred from mosquito to man are …….. .
(1) Sporozoites (2) Merozoites (3) Trophozoites (4) Gametocytes

Ans: (1)

It is found from zygote by multiple fusion are found in the salivary glands of mosquito.

27. One of the following refers to Allen's rule:
(1) If the stressful conditions are localized or remain only for a short duration, an organism either migrates or suspends itself.
(2) Mammals from colder climates have shorter ears and limbs to minimize heat loss.
(3) An organism can move form a stressful habitat to a more hospitable area and return when the stressful period is over.
(4) Low atmospheric pressure in higher altitudes results in altitude sickness.

Ans: (2)

28. Identify the DNA segment which is not a palindromic sequence:
(1) 5' GAATTC 3'
3' CTTAAG 5'
(2) 5' CCCGGG 5'
3' GGGCCC 3'
(3) 5' GGATCC 3'
3' GGTACC 5'
(4) 5' GCGGCCGC 3'
3' CGCCGGCG 5'

Ans: (3)

Sequence of nitrogen bases that reads same in $5^{|}$ to $3^{|}$ and $3^{|}$ to $5^{|}$ of complementary strand of double helix.

29. During somatic hybridization in plants, …… .
(1) somaclones are produced in large numbers
(2) the apical meristems are cultured to get virus-free plants
(3) the cell walls and the middle lamella are digested before fusing the cells
(4) crop plants with higher levels of vitamins, proteins and minerals are hybridised

Ans: (3)

In somatic hybridization plant protoplast are used. They are obtained by treating the plant cells with cellulase and pectinase.

30. **Statement A:** The secretion of collaterial gland forms the egg case in cockroach.
Statement B: The development in cockroach in hemimetabolous.
(1) Both the statements A and B are correct and B is the reason for A.
(2) Both the statements A and B are correct and B is not the reason for A.
(3) Statement A is correct and statement B is wrong.
(4) Statement B is correct and statement A is wrong.

Ans: (2)

Collaterial gland present between the third and fourth abdominal segment of female cockroach that forms egg case. Hemimetabolous type of development is incomplete metamorphosis in which young does not resemble the adult. Life cycles includes three stages namely egg, nymph and adults.

31. If a plant produces flowers when exposed only to alternating periods of 5 hours light and 3 hours dark in a 24 – hour cycle, then the plant should be a ……. .
(1) Short day plant (2) Long day plant
(3) Short-long day plant (4) Day neutral plant

Ans: (2)

Long day plants have photoperiod more than 12 hours per day.

32. If there was no carbon dioxide in the earth's atmosphere, the temperature of the earth's surface would be ……. .
    (1) same as the present level
    (2) more than the present level
    (3) less than the present level
    (4) dependent on the oxygen content in the atmosphere

Ans: (3)

Carbon dioxide is the major green house gas trapping heat on earth surface.

33. One of the following is incorrect about cancer cells:
    (1) They exhibit the property of contact inhibition.
    (2) They are metastatic.
    (3) They exhibit mass proliferation.
    (4) They are produced when cellular oncogenes of normal cells are activated.

Ans: (1)

The cancerous cells have no contact inhibition. They spread from one part of body to other. Here proto-oncogene is activated into oncogene and tumour suppressor gene is inactivated by mutations.

34. The centrosome duplicates during the ……. .
    (1) S – phase of cell cycle
    (2) G_1 – phase of cell cycle
    (3) G_2 – phase of cell cycle
    (4) Prophase of cell cycle

Ans: (1)

This is in the phase of DNA synthesis.

35. Match the items listed under Column – I with those given under Column – II; Choose the appropriate option form the given choices.

	Column – I		**Column – II**
A.	Residula Volume (RV)	P.	4000 ml – 4600 ml
B.	Inspiratory Reserve Volume (IRV)	Q.	1100 ml – 1200 ml
C.	Vital Capacity (VC)	R.	1000 ml – 1100 ml
D.	Expiratory Reserve Volume (ERV)	S.	3000 ml – 3500 ml
E.	Inspiratory Capacity (IC)	T.	2500 ml – 3000 ml

    (1) A – Q; B – R; C – S; D – T; E – P.
    (2) A – R; B – T; C – P; D – Q; E – S.
    (3) A – T; B – Q; C – S; D – R; E – P.
    (4) A – Q; B – T; C – P; D – R; E – S.

Ans: (4)

36. Which of the following statements is correct?
    (1) Elaioplasts store starch whereas aleuroplasts store proteins.
    (2) Acrocentric chromosomes have only one arm.
    (3) The core of cilium or flagellum is the basal body.
    (4) Membranous extensions into the cytoplasm in cyanobacteria which contain pigments are called chromatophores.

Ans: (3)

Cillia and flagella originate from basal body. Chromatophores are pigment-containing and light-reflecting organelles in cells of wide range of animals.

37. Sickle cell anaemia is caused due to the substitution of ……. .
(1) Valine at the 6th position of alpha globin chain by glutamic acid
(2) Glutamic acid at the 6th position of beta globin chain by valine
(3) Valine at the 6th position of beta globin chain by glutamine
(4) Glycine at the 6th position of alpha globin chain by glutamic acid

Ans: (2)

38. **Statement A:** The primary transcript produced in eukaryotes is translated without undergoing any modification or processing.
Statement B: The hnRNA in humans has exons and introns.
(1) Both the statements A and B are correct
(2) Both the statements A and B are wrong.
(3) Statement B is correct and statement A is wrong.
(4) Statement A is correct and statement B is wrong.

Ans: (3)

The primary transcript undergoes splicing, capping and tailing in eukaryotes.

39. Knee joint is an example for …… .
(1) Ball and socket joint
(2) Hinge joint
(3) Pivot joint
(4) Gliding joint

Ans: (2)

(1) is between humerus and pectoral girdle. (3)is between atlas and axis (4) is present between carpals.

40. Carefully read the following reactions carried out by nitrogen fixing bacteria. Identify the statement about these equations which is not true:

$2NH_3 + 3O_2 \rightarrow 2\,NO_2^- + 2H^+ + 2H_2O$ ……. (A)

$2\,NO_2^- + O_2 \rightarrow 2\,NO_3^-$ ……. (B)

(1) Step (A) is carried out by *Nitrosomonas* or *Nitrococcus.*
(2) Step (B) is carried out by *Nitrobacter.*
(3) Both the steps (A) and (B) can be called nitrification.
(4) Both the steps occur only in photoautotrophs.

Ans: (3)

These bacteria convert the ammonia into nitrite.

41. Match the vegetative propagules listed under Column-I with the plants given under Column-II; choose the appropriate option from the given choices.

	Column – I		**Column – II**
A	Rhizome	p	*Agave*
B	Offset	q	*Bryophyllum*
C	Sucker	r	Ginger
D	Leaf buds	s	*Chrysanthemum*
		t	*Eichhornia*

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

Ans: (3)

42. One of the following causes population explosion:
(1) Decrease in death rate, maternal mortality rate and infant mortality rate
(2) Decrease in death rate and increase in maternal mortality rate
(3) Decrease in infant mortality rate and increase in death rate
(4) Decrease in infant mortality rate and decrease in the number of people in reproductive age.

Ans: (1)

43. _____ are the most abundant proteins in the living worls.
(1) Ribozyme of plants and collagen of animals
(2) RuBisCO of plants and collagen of animals
(3) PEP case of plants and keratin of animals
(4) Alcohol dehydrogenase of plants and melanin of animals

Ans: (2)

44. One of the chief reasons among the following for the depletion in the number of species making it endangered is _____
(1) Greenhouse effect (2) Habitat destruction
(3) Over-hunting and poaching (4) Competition and predation

Ans: (2)

Habitat destruction and habitat fragmentation are the major reasons are depletion of species diversity.

45. In humans, what is the ratio of number of gametes produced from one male primary sex cell to the number of gametes produced from one female primary sex cell?
(1) 1 : 1 (2) 1 : 3 (3) 1 : 4 (4) 4 : 1

Ans: (4)

Four sperms are formed from one primary spermatocyte but only one egg is formed from primary oocyte.

46. Identify the incorrect statement from the following:
(1) Pyramid of energy is mostly upright, but sometimes it may be inverted
(2) Pyramids of number and biomass may be either upright or inverted
(3) Pyramid of biomass in sea is generally inverted as the biomass of fish far exceeds that of phytoplanktons
(4) Food chains are generally short with few trophic levels as only 10% of the energy is transferred to each trophic level from the lower trophic level.

Ans: (1)

This is due to II law of thermodynamics.

47. Match the organic compounds listed under Column- I with the explanation given under Column-II; choose the appropriate option from the given choices.

	Column – I		**Column – II**
A	Phosphoenol pyruvate (PEP)	p	6 – carbon compound
B	Ribulose biphosphate (RuBP)	q	2 – carbon compound
C	Oxaloacetic acid (OAA)	r	4 – carbon compound
D	Acetyl co-enzyme – A	s	5 – carbon compound
		t	3 – carbon compound

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

Ans: (3)

48. Down's syndrome is an example for _____
(1) Aneuploidy of sex chromosome
(2) Aneuploidy of autosome
(3) Syndrome caused due to gene mutation
(4) Loss of one sex – chromosome from the diploid set

Ans: (2)

Here, there is extra 21st chromosome.

49. The interaction between the organisms of one of the following pairs is an example for commensalism:
(1) Wasps and fig tree (2) Cuckoo and crow
(3) Cattle or sheep and grass (4) Orchid and mango tree

Ans: (4)

Here Orchid gets support but mango is neither harmed nor benefitted.

50. The germ pores in the pollen grain are the regions _____
(1) That can withstand high temperature and strong acids and alkalies
(2) Through which sperms are released into the female gametophyte
(3) Which are made up of lignin and suberin
(4) Which lack sporopollenin

Ans: (4)

This is the region without exine.

51. Heroin is ____
(1) A cannabinoid (2) Diacetylmorphine (chemically)
(3) Commonly called 'coke' or 'crack'
(4) Used to treat mental illnesses like depression and insomnia

Ans: (2)

It is synthesize from diacytylation of morphine

52. Thorns of *Bougainvillea* and tendrils of *Cucurbita* are examples for _____
(1) Convergent evolution (2) Divergent evolution
(3) Adaptive radiation (4) Co-evolution

Ans: (2)

They are homologous.

53. Some of the steps of DNA fingerprinting are given below. Identify the correct sequence from the options given:
A. Electrophoresis of DNA fragments
B. Hybridisation with DNA probe
C. Digestion of DNA by RENs
D. Autoradiography
E. Blotting of DNA fragments to nitrocellulose membrane
(1) C – A – E – B - D (2) A – C – E – D – B (3) C – A – B – E – D (4) A – E – C – B – D

Ans: (1)

54. 'Flocks' is _____
(1) The primary sludge produced in sewage treatment
(2) A type of biofortified food
(3) A mesh-like structure formed by the association of bacteria and fungal filaments in sewage treatment
(4) The effluent in primary treatment tank obtained during sewage treatment

Ans: (3)

55. ADA deficiency results in _____
(1) Increased risk of infertility (2) Inability of the immune system to function normally
(3) Chromosomal disorders (4) Decrease in the yield of crop plants

Ans: (2)

It is called SCID (Severe Combined Immuno Deficiency Disease)

56. Parbhani kranti, a variety of bhindi (lady's finger), is resistant to ___
(1) Bacterial blight (2) yellow mosaic virus
(3) Black rot (4) Leaf curl

Ans: (2)

57. The globular head of myosin contains ___
(1) Calcium ions in large quantities (2) Troponin
(3) ATPase enzyme (4) ATP

Ans: (3)

Myosin head has actin binding site and ATP binding site.

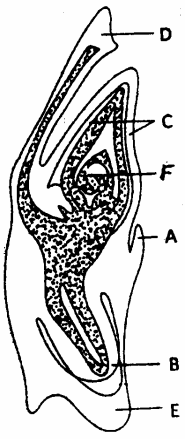
58. EcoRI is _____
(1) a restriction enzyme (2) a plasmid
(3) used to join two DNA fragments
(4) the abbreviation for bacterium *Escherichia coli*

Ans: (1)

59. 'Roquefort cheese' is ripened by using a ____
(1) Type of yeast (2) Fungus (3) Bacterium (4) Cyanobacteria

Ans: (2)

60. In this diagram showing the L.S. of an embryo of grass, identify the answer having the correct combination of alphabets with the right part:
(1) A – Root cap, B – Coleoptile, C – Scutellum, D – Coleorhiza, E – Epiblast, F – Shoot apex
(2) A – Shoot apex, B – Epiblast, C – Coleorhiza, D – Scutellum, E – Coleoptile, E – Radicle
(3) A – Epiblast, B – Scutellum, C – Coleoptile, D – Radicle, E – Coleorhiza, F – Shoot apex
(4) A – Epiblast, B – Radicle, C – Coleoptile, D – Scutellum, E – Coleorhiza, F – Shoot apex



Ans: (4)