

COMED K – BIOLOGY – 2012

VERSION CODE: D

1. Which one of the following is a step in processing of Kipps and Buffs?
a) Deliming b) Casting c) Digesting d) Reeling

Ans (a)

The deliming is the technique of processing of leather.

2. Which one of the following agents affects hatching of silk worm eggs?
a) Protozoan parasites b) Fungus
c) Mulberry leaf fermentation d) Virus

Ans (a)

Nosema bombysis is the protozoan that causes disease in silkworms.

3. A terminator codon which is called amber is
- a) UGA b) UAG c) UAA d) UUU

Ans (b)

UGA is opal and UAA is Ochre

4. In which of following groups of plants, the life cycle includes the gametophytic phase which is dominant, photosynthetic, independent and sexually reproducing?
a) Angiosperms b) Gymnosperms c) Bryophyta d) Pteridophyta

Ans (c)

In bryophytes, the sporophyte is short lived and attached to gametophyte. This gametophyte is dominant phase in the life cycle.

5. Which of the following is the correct date of publication of the book entitled "Species Plantarum" authored by Carolus Linnaeus? This date is starting point date for modern plant nomenclature.
a) 1st May 1753 b) 1st January 1935 c) 1st January 1856 d) 1st May 1856

Ans (a)

6. Which one of the following is NOT a pharmaceutical product obtained through Biotechnology?
a) Human insulin b) Human growth hormone
c) Clotting factor d) Cholecystokinin

Ans (d)

It is the hormone secreted by the duodenum. It stimulates the secretion of bile from gall bladder. Insulin, growth hormone and clotting factors are the proteins obtained from recombinant DNA technology.

7. Choose the most appropriate combination of components of respiratory membrane, from the following.
a) Alveolar wall and ducts
b) Inner and outer pleural membranes and pleural fluid
c) Membranes of alveolar ducts and capillaries
d) Alveolar wall, alveolar capillary and interstitial space

Ans (b)

The epithelium of alveolus is attached to the capillary wall to form alveolar capillary membrane.

8. Giriraja is a
- a) Cross breed of desi breed of poultry and white leghorn
 - b) Hybrid of aseel and bursa breeds of poultry
 - c) Desi breed
 - d) Cross breed of Plymouth Rock and desi breed of poultry

Ans (a)

It is obtained by crossing indigenous breed with exotic breed. It is an example for dual purpose variety.

9. Which one of the following codes for an amino acid?
- a) Cistron
 - b) Exon
 - c) Codon
 - d) Intron

Ans (a)

It is the segment of DNA that codes for an amino acid.

10. Plasmids were discovered by
- a) Hayes and Lederberg
 - b) Lederberg and Tatum
 - c) Boliver and Rodriguez
 - d) Messing and Viera

Ans (a)

Lederberg and Tatum discovered genetic recombination in bacteria.

11. Which of the following is NOT a component of non specific defense?
- a) Mucous membrane
 - b) Phagocytosis
 - c) Lysozyme
 - d) Killer T cells

Ans (d)

They are the specific T lymphocytes.

12. From which part of the human heart does the largest artery arise?
- a) Left ventricle
 - b) Right ventricle
 - c) Left atrium
 - d) Right atrium

Ans (a)

Aorta originates from right ventricle.

13. In the electron transport chain the first ATP molecule is generated when the hydrogen passes from
- a) FMN to NAD
 - b) FMN to COQ
 - c) NAD to FMN
 - d) NAD to COQ

Ans (c)

This is the first complex of the inner membrane of mitochondria

14. Which one of the following is NOT a correct statement with reference to placenta?
- a) It prevents the movement of maternal IgG antibody from the mother of the foetus
 - b) It acts as a foetal lung
 - c) It acts as a foetal liver by storing glycogen
 - d) It acts as an endocrine gland

Ans (a)

IgG can be easily transported across the placenta.

15. A professor wanted to demonstrate a physiological process. He filled a glass bottle with previously moistened gram seeds. He screw capped the bottle and kept it away in a corner, and resumed the lecture. After about 45 minutes there was a sudden explosion with shattering of the glass bottle into pieces of glass. Which of the following phenomenon did the professor wanted to demonstrate?

- a) Diffusion
- b) Imbibition
- c) Anaerobic respiration
- d) Osmosis

Ans (b)

During imbibition, the pressure develops. It is the strongest of all the pressure.

16. A tactile organ in cockroach is

- a) Antennae
- b) Ommatidia
- c) Fenestrae
- d) Anal cerci

Ans (a)

They are sensitive to touch. b) Ommatidia are the facets of compound eyes. Fenestrae are the simple eyes. Anal cerci originate from 9th segment of abdomen.

17. Continuity of cytoplasm from cell to cell is maintained through

- a) Pit canals present in primary walls
- b) Plasmodesmata
- c) Plasmalemma
- d) Middle lamella

Ans (b)

18. Carl Correns a rediscoverer of Mendel's work was from

- a) Austria
- b) Germany
- c) Holland
- d) Denmark

Ans (b)

19. Humulin is produced by genetic engineering using one of the following organisms

- a) Bacillus coagulens
- b) Escherichia coli
- c) Aspergillus species
- d) Agrobacterium tumefaciens

Ans (b)

The *E. coli* are used as host cells.

20. Cranial nerves are part of

- a) sympathetic nervous system
- b) Parasympathetic nervous system
- c) somatic nervous system
- d) central nervous system

Ans (b)

21. The pressure which favours filtration of blood in the kidney and the one which opposes the filtration of blood are and respectively

- a) Glomerular hydrostatic pressure and glomerular osmotic pressure
- b) Capsular hydrostatic pressure and glomerular osmotic pressure
- c) Glomerular osmotic pressure and glomerular hydrostatic pressure
- d) Glomerular osmotic pressure and arterial pressure

Ans (a)

The effective filtration pressure = net hydrostatic pressure – net osmotic pressure

22. According to active K⁺ transport hypothesis, besides the organic acids, the turgidity of guard cells is controlled by which one of the following combinations of ions?

- a) K⁺, Na⁺, Cl⁻
- b) K⁺, Na⁺, H⁺
- c) K⁺, H⁺, Cl⁻
- d) K⁺, Na⁺, H⁺, Cl⁻

Ans (c)

It is ion flux theory of stomatal movement.

23. Which one of the following is NOT a cause of male infertility?

- a) Oligospermia b) Asthenozoospermia c) Teratazoospermia d) Motile sperms

Ans (d)

Low sperm count and defective sperms are the causes for the infertility

24. The first stable compound formed in Kerb's cycle is

- a) Acetyl Co A b) Citric acid c) Oxaloacetic acid d) Fumaric acid

Ans (b)

This citric acid is formed from the combination of two carbon compound and a four carbon compound.

25. A prehensile tail as in chameleon is an adaptation for

- a) swimming b) grasping c) sliding d) climbing

Ans (b)

It longer in this animal

26. Which one of the binomials is the source of an expectorant used in the treatment of bronchitis, asthma and cough?

- a) Oscimum sanctumb) Adathoda vasica c) Gymnema sylvestre d) Phyllanthus emblica

Ans (b)

Gymnema is used as antidiabetic.

27. Which of the following combination of physiological processes occur during photosynthesis?

- a) Water is reduced and CO₂ is oxidized b) Both CO₂ and water get oxidized
c) CO₂ is reduced and water is oxidized d) Both CO₂ and water get reduced

Ans (c)

CO₂ fixation and photolysis in thylakoid

28. The children of a father with type 'O' blood and mother with type 'AB' blood could have the blood type

- a) 'O' type b) 'AB' type c) 'O' or 'AB' type d) 'A' or 'B' type

Ans (d)

There is no i and i combinations.

29. The phenomenon which shortens the vegetative period and hastens the flowering is known as

- a) Etiolation b) Vernalization c) Photoperiodism d) Parthenocarpy

Ans (b)

Parthenocarpy is the development of fruit without fertilization.

30. The two, more distantly related phyla are

- a) Cnidarians and Platyhelminthes b) Annelida and Arthropoda
c) Chordata and Echinodermata d) Mollusca and echinodermata

Ans (c)

These two share many common feature during embryonic development.

31. The process of transfer of genetic material (DNA) of one bacterium to the other bacterium with the help of bacteriophage is called

- a) translation b) transduction c) transformation d) conjugation

Ans (b)

It is vector mediated genetic transfer

Discovered by Lederberg and Zinder

Translation – Protein synthesis

Transformation – Discovered by Griffith. Here living bacterial cells take the genetic material from Dead bacterial cell

Conjugation: Discovered by Lederberg and Tatum.

Transfer of genetic material from one bacterial cell to another bacterial cell through conjugation bridge.

32. Which one of the following is NOT a function of Sertoli cells?

- a) Acting as nurse cell to the sperms
- b) Secreting the hormone inhibin
- c) Forming a manchette
- d) Secreting testicular fluid for transporting sperms to the lumen of the seminiferous tubule

Ans (d)

Semen is contribution of Prostate gland seminal vesicle and Bulbourethral gland secretion.

33. In the Lac-operon of *Escherichia.coli* there are three adjacent structural genes viz. lac Z, lac Y, and lac A. Lac A gene codes for

- a) Beta galactosidase
- b) Beta galactoside transacetylase
- c) Beta galactoside permease
- d) Polymerase

Ans (b)

Lac – Z codes for β - galactosidase

Lac – Y codes for Lacose permease

34. Which one of the following features represents a recessive character in Mendel's pea plants?

- a) Round seed
- b) Green pod colour
- c) Red flower
- d) Yellow pod colour

Ans (d)

Round seeds red flower and green colour pods are dominant trait.

35. Where would you look for active cell division in a plant?

- a) In the pith cells
- b) At the tips of roots and stems
- c) In cells of cortex
- d) In the internodal region

Ans (b)

These region have apical meristems

36. Which one of the following is a correct combination of two biodiversity hot spots in India?

- a) Eastern Himalayas and Eastern ghats
- b) Eastern Himalayas and Western ghats
- c) Western ghats and Eastern ghats
- d) West coast and Western ghats

Ans (b)

37. Which one of the following reactions is catalyzed by the enzyme reverse transcriptase?

- a) Transfer of information from RNA to RNA
- b) Transfer of information from DNA to RNA
- c) Transfer of information from Protein to DNA
- d) Transfer of information from RNA to DNA

Ans (d)

Reverse transcriptase = RNA dependent DNA polymerase and is found in retroviruses

38. Which of the following processes helps in maintaining blood glucose level under fasting?

- a) Glycogenesis b) Glycogenolysis c) Lipogenesis d) Glycolysis

Ans (b)

Breakdown of glycogen to glucose under the influence of hormone glucagons

39. What happens during endosmosis? Choose the correct answer from the following

- a) Water molecules diffuse from lower water potential to higher water potential
b) Water molecules diffuse from higher water potential to lower water potential
c) Water molecules move from a solution towards pure water
d) Water molecules move from cell towards its exterior

Ans (b)

Here outer (external solution) has higher Ψ_w and cell sap of cell has lower Ψ_w

40. Which of the following is a structural polysaccharide in animals?

- a) Glycogen b) Chitin c) Keratin d) Pectin

Ans (d)

Glycogen: Homopolysaccharide and reserve food

Chitin: Structural homopolysaccharide in the fungal cell wall

Keratin: Scleroprotein

41. Which one of the following enzymes is NOT necessary for obtaining protoplasts for their somatic hybridization?

- a) Cellulase b) Primase
c) Pectinase d) Both cellulose and pectinase

Ans (b)

These are transmembrane proteins required to transport specific compounds across membrane

42. Which one of the following breeds of cow is a milch breed?

- a) Amrit mahal b) Hallikar c) Sindhi d) Surti

Ans (c)

(a) and (b) – Drought / draft breeds

Surti – is milk / milch goat breed and Buffalo breed

43. Which of the following animals does not have a food value?

- a) Snake b) Lizard c) Field rat d) Domestic Cat

Ans (b)

44. In which of the following groups, the majority of plant orders contain the vascular tissue wherein the vessels and companion cells are absent in the xylem and phloem?

- a) Angiosperms b) Thallophytes c) Bryophytes d) Gymnsperms

Ans (d)

Bryophyte : Avascular plants

Angiosperm : Vascular spermatophyte

Thallophyte : Avascular plants. Eg: Algas, fungi, bryophyte

In gymnosperm tracheid and albuminous cells are found

45. Which one of the following families has features like bisexual, pentamerous, gamopetalous corolla with epipetalous stamens, sagittate anthers, subapocarpous ovary and a pair of follicles as their diagnostic characters?

- a) Malvaceae b) Leguminosae c) Musaceae d) Apocynaceae

Ans (d)

Malvaceae: Bisexual pentamerous, polypetalous but basally united, monodelphous, monotheclus anther, pentacarpellary ovary, and capsule

Musaceae: Bisexual, Trimerous tapels and fruit are in 2 whorls of three each, bitheclus anther, stamens are arranged (3 + 2) condition, tricarpellary ovary and berry fruit.

Read the following passage and answer Question No. 46 to 48

Double fertilization is an exclusive feature found in flowering plants.

46. Based on the course of the growth of pollen tube and entry into the ovule which one of the following is known as misogamy?

- a) Entry of pollen tube through the micropyle into the ovule
b) Entry of pollen tube through the placenta and the funiculus
c) Entry of pollen tube through the integuments
d) Entry of pollen tube through the funiculus and chalaza into the embryo sac from the egg apparatus end

Ans (c)

Ex: Cucurbita

(a): Porogamy Ex.: *Lily*

(d): Chalazogamy Ex.: *Betula*

47. Which one of the following events lead to double fertilization

- a) Fusion of two polar nuclei
b) Fusion of a male gamete with the egg and the other with antipodal cells
c) Fusion of a male gamete with the egg and the other with secondary nucleus
d) Fusion of a male gamete with two polar nuclei and the other with nucellar cells

Ans (c)

48. Mature embryosac in majority of Angiosperms is

- a) 8 celled and 8 nucleate b) 7 celled and 8 nucleate
c) 5 celled and 7 nucleate d) 3 celled and 4 nucleate

Ans (b)

- 3-cell – Antipodal cells
- 3-cell – Egg apparatus (one egg + 2 synergids)
- 1-secondary nuclei – with two nucleus

Read the following passage and answer Question NO. 49 to 51

Sclerenchyma is a simple permanent tissue with thick secondary lignified cell walls.

49. In which of the following cells the secondary cell walls are present?
- a) The cells containing cytoplasm only b) The cells with protoplast
c) The cells which are living at maturity d) The cells which are non living at maturity

Ans (d)

Secondary cell wall formation in plant cell leads to cell senescence

50. The grittiness of the pulp of wood apple is due to
- Macrosclereids b) Bracnysclereids c) Osteosclereids d) Astrosclereids

Ans (b)

Macrosclereid : Seed coat of Pea, leaves of xerophyte

Osteosclereid: Seed coat of monocot seed

Astrosclereid: Petiol of *Nymphaea*

51. Which one of the following statements regarding sclerenchyma is NOT correct?
- a) Sclerenchyma fibres associated with xylem tissue are called wood fibres
b) Sclerenchyma fibres associated with phloem tissue are called bast fibres
c) Endocarp of coconut is rich in sclerenchyma fibres
d) Brachysclereids are isodiametric and polygonal

Ans (c)

Endocarp of coconut has sclereid

Mesocarp of coconut and mango has fibres

Read the following passage and answer Question No. 52 to 54

The mechanism of fertilization involves different events like approximation of gametes, acrosomal reaction activation of egg and amphimixis. According to F.R. Lillie approximation occurs due to interacting complementary substances called fertilizin and anti fertilizin.

52. Fertilizin is
- a) a glycoprotein b) an acidic protein c) a carbohydrate d) a lipid

Ans (a)

- Fertilizin (gynogamone) – constituent of egg envelope

- Anti fertilizing (Androgamone) – acidic protein constituent of plasma membrane of sperm head

53. The fertilization membrane is formed in order to
- a) Facilitate the entry of sperm into the egg
b) Provide stability to the egg
c) Prevent monospermy
d) Prevent polyspermy

Ans (d)

Fertilization membrane is formed from vitelline membrane after fertilization

54. During amphimixis many events occur. Choose the INCORRECT event from the following events.
- a) Swelling of the sperm nucleus
 - b) Initial movement of the male pronucleus along the copulation path
 - c) Establishment of achromatic spindle by the proximal centriole
 - d) Completion of second meiotic division if it has not occurred already

Ans (b)

Initial movement of male pronucleus in the cortex of egg is called penetration path

Read the following passage and answer Question No. 55 to 57

A 10 year old patient is found to have the following clinical features: Slanting eyes with epicanthic fold of skin in the eyelid, hypertelorism, dysplastic ears, mongoloid face and protruding tongue.

55. The above mentioned features are associated with which syndrome?
- a) Down's syndrome
 - b) Klinefelter's syndrome
 - c) Turner's syndrome
 - d) Cri-du chat syndrome

Ans (a)

$(45A + XX \text{ or } 45A + XY) = 47$

56. The chromosomal condition of the above syndrome is
- a) Autosomal aneuploidy
 - b) Allosomal hyperaneuploidy
 - c) Allosomal hypoaneuploidy
 - d) Autosomal partial deletion

Ans (a)

- Trisomy of 21st chromosome (45 A)
- Due to non disjunction of 21st chromosome during gamete formation (usually during egg formation)

57. Which one of the following is the correct chromosomal complement of the above syndrome?
- a) 47 chromosomes due to extra chromosome 21
 - b) 47 chromosomes with 44A plus XXY
 - c) 45 chromosomes with 44A plus XO
 - d) Partial deletion of short arm of 5th chromosome

Ans (a)

- (b) – Klinefelter's syndrome
- (c) – Turner's syndrome
- (d) – Cri-due chat syndrome

Read the following passage and answer Question No. 58 to 60

According to theory put forth to explain the mechanism of organic evolution, when structure of a gene under goes a change, the trait it represents also changes. This results in a heritable variation in population, and may lead to the formation of new species from pre existing species.

58. The above theory is known as
- a) theory of origin of species by natural selection
 - b) mutation theory
 - c) theory of inheritance of acquired characters
 - d) theory of biogenesis

Ans (b)

Proposed by Hugo de Vries while studying plant *oenothera lamarckiana* (evening prim rose) (1901)

59. Change in gene structure is termed
- a) mutation
 - b) variation
 - c) genetic drift
 - d) Gene knock out

Ans (a)

Genetic drift: Random change in the gene frequency in a population purely a matter of chance.

Variation: Changes in the morphological, physiological characters in the offsprings from their parents.

Genetic knock out: Genetic technique in which an organism is engineered to carry genes that been made inoperative.

60. Who put forth the above theory of evolution?
- a) Darwin
 - b) De Vries
 - c) Lamarck
 - d) Wallace

Ans (b)

Darwin – theory of origin of species by natural selection

Lamarck – theory of inheritance of acquired characters

Alfred Russel Wallace – Independently proposing theory of evolution due to natural selection.