Increase Selection Chance by 16X

EDUGORILLA™ PUBLICATION

Conducted by Karnataka Examination Authority (KEA)

Karnataka Common Entrance Test

KCET

Biology

10 Practice Tests

BIOLOGY

Karnataka Common Entrance Test - KCET

Latest Edition
Practice Kit

10 Tests

10 Practice Test

Based On Real Exam Pattern

✓ Thoroughly Revised and Updated

✓ Detailed Analysis of all MCQs

TABLE OF CONTENTS

Practice Test 01

1. **Global warming is caused due to:**
   (a) Evaporation
   (b) Green house effect
   (c) Transpiration
   (d) Desertification

2. **The gases present in the atmosphere that causes the greenhouse effect are:**
   (a) Carbon dioxide, sulphur dioxide, methane
   (b) Nitrous oxide, oxygen, water vapour
   (c) Methane, water vapour, carbon dioxide
   (d) Carbon dioxide, oxygen, nitrogen

3. **In a food chain, what is the difference between primary consumers and secondary consumers?**
   (a) Primary consumers eat plants and other consumers, secondary consumers eat plants and decomposed matter.
   (b) Primary consumers eat plants and decomposed matter, secondary consumers eat plants and other consumers.
   (c) Primary consumers eat other consumers, secondary consumers eat only plants.
   (d) Primary consumers eat only plants, secondary consumers eat primary consumers.

4. **Which of the following is the first country to become Carbon-Negative?**
   (a) Canada
   (b) United States of America
   (c) Bhutan
   (d) Poland

5. **In context with the Environment, the price charged to deliver municipal solid waste to a landfill, waste-to-energy facility, or recycling facility is known as _____?**
   (a) Recycling Fee
   (b) Dumping Duty
   (c) Tipping Fee
   (d) Material Fee

6. **Direction: Which of the following statements are correct regarding the Dusky gopher frog?**
   1) It is is a critically endangered species of frog in the family Ranidae.
   2) It is endemic to the southern United States.
   Select the correct answer from the codes given below:
   (a) Only 1
   (b) Only 2
   (c) Both (1) and (2)
   (d) Neither (1) and (2)

7. **Which of the following characteristic is incorrect with respect to gymnosperms?**
   (a) In Gymnosperms, the male and female gametophyte do not have an independent free-living existence.
   (b) The Sequoia is one of the tallest free-living while Zamia is the smallest gymnosperm known.
   (c) The plant free-living the diploid saprophytic phase in the life cycles.
   (d) Gymnosperms are homosporous.

8. **Seymouria is the connecting link between_____.**
   (a) Amphibia and aves
   (b) Amphibia and reptilia
   (c) Annelida and arthropoda
   (d) Annelida and mollusca

9. **In Angiosperm, characters of flowers are used for classification because-**
   (a) Flowers are attractive
   (b) Flowers are larger
   (c) Characters of flowers are conservative
   (d) None of the above

10. **Direction: For the Assertion (A) and Reason (R) below, choose the correct alternative**
    Assertion : "The Biological Species" concept helps us to ask how species are formed.
    Reason : The concept of biological species focuses our attention on the question of how reproductive isolation comes about.
    (a) If both the assertion and the reason are true and the reason is a correct explanation of the assertion
    (b) If both the assertion and reason are true but the reason is not a correct explanation of the assertion
    (c) If the assertion is true but the reason is false
    (d) If both the assertion and reason are false

11. **The taxonomic unit 'Phylum' in the classification of animals is equivalent to which hierarchical level in the classification of plants?**
    (a) Class (b) Order
    (c) Division (d) Family

12. **One of the special characters of Coelenterata only is the occurrence of:**
    (a) Polymorphism
    (b) Flame cells
    (c) Hermaphroditism
    (d) Nematocysts

13. **Function of ADH (Antidiuretic hormone) is:**
    (a) Water reabsorption
    (b) Water excretion
    (c) Na^+ absorption
    (d) K^+ secretion

14. **Maximum amount of glucose absorption occurs at?**
    (a) PCT
    (b) DCT
    (c) Loop of Henle
    (d) None of these

15. **Why does a patient with ADA deficiency require a repeated infusion of genetically engineered lymphocytes?**
    (a) They are unable to produce WBC
    (b) Immune response is hampered
    (c) Blood coagulation do not take place
    (d) Both (A) and (B)

16. **Which of the following genes were introduced in cotton to protect it from cotton bollworms?**
    (a) CryAc and CryAb
    (b) BtAc and BtAb
    (c) CrylAc and CryllAb
    (d) Nif genes

17. **Bacillus thuringiensis (Bt) strains have been used for designing novel:**
    (a) Biofertilizers
    (b) Bio-metallurgical techniques
    (c) Bio-mineralization process
    (d) Bio-insecticidal plants

18. **A genetic disorder can be cured through:**
    (a) rDNA technology
    (b) Embryo transfer
    (c) Gene therapy
    (d) All of these

19. **Rules of conduct that may be used to regulate our activities in relation**

to the biological world is called _____.

(a) Bioethics (b) Biowar
(c) Biopatent (d) Biopiracy

20. The Bt toxin is used for killing nematodes in crop plants. But, it is non-toxic to humans. Select the correct reason for this.

(a) The pro Bt-toxin activation requires temperature above human body temperature
(b) The Bt-toxin recognises only insect-specific targets.
(c) The pro Bt-toxin activation requires pH lower than that present in the human stomach.
(d) Conversion of pro Bt-toxin to Bt-toxin takes place in highly alkaline conditions.

21. Which of the following is not the similarity between alcoholic and lactic acid fermentation?

(a) In both fermentation process , less than seven percent of energy in glucose is released and not all of it is tapped as high energy bond of ATP
(b) Both the process is hazardous
(c) Net gain in both the type of fermentation is 2 ATP
(d) Both result in release of CO_2 along with ethanol and lactic acid respectively

22. Which is not an example of a one-sided symbiotic relationship?

(a) Cattle egrets and cattle
(b) A hermit crab and an empty seashells
(c) A spider on a tree
(d) Tapeworm in host's stomach

23. Syphilis is a sexually transmitted disease which is caused by the infection of:

(a) Bacillus Haemophilus ducreyi
(b) Human Papilloma virus
(c) Treponema pallidum
(d) Trichomonas vaginalis

24. Which of the following microbes are used for the commercial production of citric acid?

(a) Xanthomonas citri
(b) Asparagine
(c) Asparagus
(d) Aspergillus

25. Usnic acid is an antibiotic obtained from:

(a) Fungi (b) Bacteria
(c) Lichens (d) Algae

26. Protein synthesis in a cell takes place _____.

(a) Only on ribosomes attached to the nuclear envelope
(b) In the nucleolus as well as in cytoplasm
(c) In cytoplasm as well as in mitochondria
(d) Only in the cytoplasm

27. In RNA, thymine is replaced by_____.

(a) Guanine
(b) Uracil
(c) Both (A) and (B)
(d) None of these

28. Carrier ions like sodium ions facilitate the absorption of substances like:

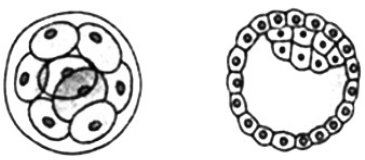
(a) Amino acids and glucose
(b) Glucose and fatty acids
(c) Fatty acids and glycerol
(d) Fructose and some amino acids

29. Match the column I and II and choose the correct combination from the options given regarding Cockroach.

	Column I		Column II
a.	Testes	K.	2 th - 6 th segments
b.	Ovaries	L.	4 th - 6 th segments
c.	Spermathecae	M.	6 th - 7 th segments
d.	Mushroom	N.	6 th segments

(a) a-L, b-K, c-M, d-N
(b) a-L, b-K, c-N, d-M
(c) a-K, b-L, c-N, d-M
(d) a-N, b-M, c-K, d-L

30. Recognize the figure and find out the correct matching.



(a) a-morula, b-blastocyst
(b) a-blastocyst, b-morula
(c) a-blastocyst, b-gastrula
(d) a-morula, b-gastrula

31. Both corpus luteum and macula lutea are:

(a) Found in human ovaries
(b) Found in human ovaries
(c) Characterized by a yellow colour
(d) Contributory in maintaining pregnancy

32. Which of the following is not a process of asexual reproduction?

(a) Budding
(b) Syngamy
(c) Gemmulation
(d) Fragmentation

33. Clones are:

(a) Only morphologically alike
(b) Only genetically alike
(c) Morphologically as well as genetically alike
(d) Occassionally genetically alike

34. The lifespan of sperm fertility is:

(a) 90 days (b) 5 days
(c) 6 hours (d) Infinite

35. Cells are autonomous because:

(a) They synthesize components of living protoplasm from non-living materials
(b) They are able to grow and divide
(c) Each cell has its own life span
(d) All of the above

36. Which of the following is a function of the "Nucleolus"?

(a) Formation of ribosomes
(b) Transmission of genetic information
(c) Formation of proteins
(d) None of the above

37. The main feature of heterosis is:

(a) The hybrid variety F1 exhibits superiority over both parents in yield, adaptation, quality and maturity only.
(b) The superiority is under genetic control only.
(c) The superiority is reproducible in specific environment only.
(d) All of these

38. Which of the following is not a characteristic of dicotyledons plants?

(a) These plants have 2 cotyledons.
(b) These plants have fibrous roots.
(c) These plants have reticulate venation.
(d) These plants have a tap root.

39. Respiration in Limulus takes place through:

(a) Gills

(b) Book-gills
(c) Book lungs
(d) Tracheal system

40. Which among the following is NOT the characteristic feature of Smooth Muscle Fibres?
(a) They bear a central single nucleus
(b) These fibres are cylindrical in shape
(c) They are present in internal organs
(d) They are involuntary in nature

41. Ciliated epithelium is present in the:
(a) Trachea (b) Ureter
(c) Intestine (d) Heart

42. The pseudostratified epithelium is present in:
(a) Nephron and neuron
(b) Larynx and pharynx
(c) Trachea and bronchi
(d) Urinary bladder and intestine

43. Vascular bundles in a dicot leaf are:
(a) Conjoint, collateral and open
(b) Conjoint, collateral and closed
(c) Collateral and open
(d) Collateral and closed

44. Choose the correct statements:
A. The insects like bees and mosquitos eyes are different than humans and animals.
B. Bees and mosquitos can see different direction at the same time.
(a) Only A
(b) Only B
(c) Both A and B
(d) Neither A nor B

45. The number of chromosomes in a human female germ cell is: _____
(a) 24 (b) 46
(c) 23 (d) 48

46. DNA are composed only of:
(a) Nucleic acid (b) Protein
(c) Lipid (d) Altogether

47. The basic structural and functional unit of heredity is:
(a) Nucleus
(b) DNA
(c) Chromosome
(d) Gene

48. The concept of natural selection was given by:
(a) Charles Darwin
(b) Lamarck
(c) Mendel
(d) Weismann

49. A zygote which has an X - chromosome inherited from the father will develop into
(a) girl
(b) boy
(c) either boy or girl
(d) X - chromosome does not influence the sex of a child.

50. Turner's syndrome is characterized by chromosomes
(a) 46 (b) 45
(c) 47 (d) 48

Ques (51-52): Direction : In the following question a statement of assertion is given and a corresponding statement of reason is given just below it. Mark the correct answer.

51. Assertion : Megaspore mother cell undergoes meiotic division.
Reason : All four megaspres form female gametophyte.
(a) Both assertion and reason are true and reason is a correct explanation of the assertion.
(b) Both assertion and reason are true but reason is not a correct explanation of the assertion.
(c) Assertion is true but Reason is false.
(d) Both Assertion and Reason are false.

52. Assertion: Water is not required for fertilization process in ferns.
Reason: Malic acid of Archegonial neck attracts antherozoids.
(a) Both the assertion and the reason are true and the reason is a correct explanation of the assertion.
(b) Both the assertion and reason are true but the reason is not a correct explanation of the assertion.
(c) The assertion is true but the reason is false.
(d) The assertion is false and the reason is true.

53. Which one of the following is considered important in the development of seed habit?
(a) Dependent sporophyte
(b) Heterospory
(c) Haplontic life cycle
(d) Free-living gametophyte

54. Which of the following statement is not a difference between monocots and dicots?
(a) Dicot seeds have two cotyledons and monocot seeds have only one cotyledon.
(b) Dicots show tap root system and monocots show fibrous root system.
(c) In dicots, the flowers are unisexual and in monocots flowers are bisexual.
(d) Dicot leaves show reticulate venation and monocot leaves show parallel venation.

55. Largest ovules and male gametes are found in:
(a) Monocots
(b) Dicots
(c) Both (A) and (B)
(d) Gymnosperm

56. Maximum amount of CO_2 produced by our body is transported:
(a) As bicarbonates
(b) As carbonates
(c) Attached to haemoglobin
(d) Dissolved in blood plasma

57. Emphysema is a condition resulting from:
(a) Cigarette smoking
(b) Liquor consumption
(c) Drug addiction
(d) None of the above

58. The function of cerebrospinal fluid does not include:
(a) Protection of brain and spinal cord by containing antibody
(b) Protection of delicate brain and spinal cord from shock
(c) As a medium for excretion of waste product
(d) Buoyancy to brain

59. In which one of the following options the two examples are correctly matched with their particular type of immunity?
(a) Polymorphonuclear leukocytes and monocytes, Type of immunity : Cellular barriers
(b) Anti - tetanus and anti - snake bite injections, Type of immunity : Active immunity
(c) Saliva in mouth and tears in eyes, Type of immunity : Physical barriers
(d) Mucus coating of epithelium lining the urinogenital tract and the HCI in stomach, Type of immunity : Physiological barriers

60. The exchange of gases between the

external environment and the lungs____.

(a) Respiration
(b) External respiration
(c) Cellular respiration
(d) None of the above

// Hints and Solutions //

1(B). Global warming is caused due to green house effect.

- An increase in the average temperature of the earth surface due to the greenhouse effect is called global warming.
- It also refers to the increase in the average temperature of the air and sea at the earth's surface which causes climate change.
- Global warming is caused due to the Greenhouse effect.

2(C). The gases present in the atmosphere that causes the greenhouse effect are methane, water vapour, carbon dioxide.

- Greenhouse Effect: Solar energy trapped by the earth's atmosphere and radiate it slowly so as to cover our earth with a warm blanket. This is the natural process of the greenhouse effect on earth to maintain its temperature and makes the earth perfect for life.
- Greenhouse gases are carbon dioxide, other greenhouse gases are methane, water vapor, nitrous oxide, CFCs, and ozone.

3(D). Primary consumers are the animals that feed on primary producers. They make the second trophic level of the energy pyramid and are consumed by secondary and tertiary consumers. Green plants, cows, goats, herbivorous birds, zooplankton, etc. are some examples of primary consumers.
Secondary consumers are animals that feed on primary consumers. They also make the third trophic level of the energy pyramid. Humans are a good example of secondary consumers. Secondary consumers can be either carnivores or omnivores. Other examples are dogs, cats, etc.

4(C). Bhutan is the world's first and only carbon-negative country.
The government of Bhutan has a history of basing political decisions on a Gross National Happiness (GNH) index and abandoning economic growth as its compass. It's the only country in the world to make such a switch and the first country to become carbon negative. The country emits around 1.5 million tons of carbon annually, its forests can absorb over 6 million tonnes.

5(C). The price charged to deliver municipal solid waste to a landfill, waste-to-energy facility, or recycling facility is known as tipping fee.

6(C). The Dusky gopher frog, which is also known as the Mississippi gopher frog is a critically endangered species of frog in the family Ranidae. It is endemic to the Southern United States.

7(D). The gymnosperms are the plants in which seeds are not enclosed within a fruit wall, that is they bear naked seeds.
In Gymnosperms, the male and female gametophyte does not have an independent free-living existence.
The Sequoia is one of the tallest gymnosperms while Zamia is the smallest gymnosperm known.
The plant represents the diploid saprophytic phase in the life cycles.
Gymnosperms are heterosporous, produces smaller microspore and larger megaspores. These spores are produced within the sporangia that are borne on sporophyll, arranged on the spirally along an axis to form compact or cones.

8(B). Seymouria is the connecting link between amphibia and reptiles.
They lived about 280-270 million years ago – during the early Permian period.
It is believed that it could secrete salt like reptiles from its snout and could live without water for a longer duration.
That's why Seymouria skin was more like a reptile and less like a true amphibian.

9(C). In Angiosperm, characters of flowers are used for classification because characters of flowers are conservative. Gymnosperms have no flowers and have naked seeds. Angiosperms are also called as flowering plants. Flowers are the reproductive organs for these plants. Examples of angiosperms include roses, tulips, tomatoes.

10(A). Ernst Mayr proposed the biological species concept, which defines species as groups of actually or potentially inter-breeding natural populations which are reproductively isolated from other such groups.
Reproductive isolation is a condition of speciation and the primary criterion of the biological species concept. In the well-known Ernst Mayr's definition, "species are groups of actually or potentially interbreeding natural populations, which are reproductively isolated from other such groups" (Mayr, 1942).
So, if both the assertion and the reason are true and the reason is a correct explanation of the assertion.

11(C). The taxonomic unit 'Phylum' in the classification of animals is equivalent to the 'Division' hierarchical level in the classification of plants.
Phylum/Division is a taxonomic category higher than that of class and lower than that of the kingdom. The term phylum is used for animals while the term division is used for plants. A division or phylum is formed of one or more classes. The Phylum Chordata or animals contains various classes such as Aves, Reptilia, Amphibia, Cyclostomata, Chondrichthyes, Osteichthyes, Mammalia, etc. The division Angiospermae of plants consists of two classes- Dicotyledonae and Monocotyledonae.

12(D). One of the special characters of Coelenterata only is the occurrence of Nematocysts.
Coelenterates are acoelomate. They have a one-hole that functions as the mouth and anus. The hole is enclosed by tentacles. The tentacles consist of specific types of cells known as nematocysts are located in Coelenterata only. These cells are used for food catching, defensive and offensive purposes. And also nematocysts cells serve to immobilize prey with toxins contained within the cells. Nematocysts contain coiled threads that may bear barbs.

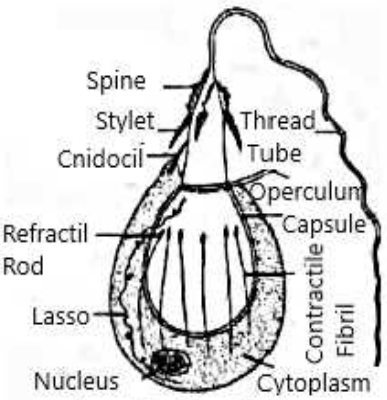


Fig.: Cnidoblast discharged.

13(A). The antidiuretic hormone binds to receptors on cells in the collecting ducts of the kidney and promotes reabsorption of water back into the circulation. These channels transport solute-free water through tubular cells and back into the blood, leading to a decrease in plasma osmolarity and an increased osmolarity of urine.

14(A). PCT(Proximal convoluted tubule) is lined by a simple cuboidal brush border epithelium which increases the surface area for reabsorption. Nearly all of the essential nutrients and 70-80 percent of electrolytes and water are reabsorbed by this segment. Glucose is absorbed actively by PCT. It is reabsorbed using a cotransporter with sodium.

15(D). A patient with ADA deficiency require a repeated infusion of genetically engineered lymphocytes as they are unable to produce WBC and their immune response is hampered.

- ADA deficiency is also called adenosine deaminase deficiency. It is an autosomal recessive metabolic disorder. It results

in immunodeficiency.
- The immune response of an individual is hampered. Its symptoms include pneumonia, chronic diarrhea, skin rashes.
- It can be treated by a bone marrow transplant in which healthy immune cells are used to replace the defective immune cells.
- Other treatment includes a repeated infusion of genetically engineered peripheral blood lymphocytes as they are unable to produce WBC.

16(C). CrylAc and CryllAb genes were introduced in cotton to protect it from cotton bollworms.
- Two cry genes, CrylAc and CryllAb have been incorporated in cotton.
- The genetically modified crop is called Bt cotton as it contains Bt toxin genes.
- The genes CrylAc and cryllAb control cotton bollworms.

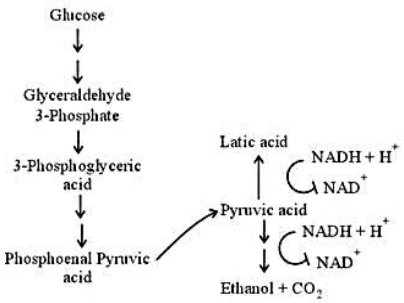
17(D). Bacillus thuringiensis (Bt) strains have been used for designing novel bio-insecticidal plants.
- Bio-insecticides are those biological agents that are used to control harmful insects.
- Because of the development of methods of genetic engineering, B. thuringiensis toxic genes are introduced into plants.
- Such plants are resistant to attack by insect pests.
- Bt cotton is one such example.

18(C). A genetic disorder can be cured through gene therapy.
- Gene therapy replaces a faulty gene or adds a new gene in an attempt to cure disease or improve your body's ability to fight disease.
- Gene therapy holds promise for treating a wide range of diseases, such as cancer, cystic fibrosis, heart disease, diabetes, hemophilia and AIDS.

19(A). Rules of conduct that may be used to regulate our activities in relation to the biological world is called Bioethics.
- Bioethics may be viewed as the set of standards that may be used to regulate various activities based on their effects on the biological world.
- This is because biotechnology has aroused social as well as political concerns, which have ranged from biotechnology being unnatural to detrimental to biodiversity.

20(D). The Bt toxin is used for killing nematodes in crop plants. But, it is non-toxic to humans due to conversion of pro Bt-toxin to Bt-toxin takes place in highly alkaline conditions.
- Bt toxins are used to kill insects but for humans, it is non-toxic because it behaves as a dietary protein.
- These breakdown very rapidly due to high acidic conditions in the human stomach and are harmless.
- As human stomach digests the concerned protein, therefore, it is not toxic to humans.

21(D). Fermentation is a kind of anaerobic respiration, carried out by fungi and bacteria.
It is of 2 types:
A. Alcoholic fermentation
B. Lactic acid fermentation
The major difference: Alcoholic fermentation result in release of CO_2 along with ethanol while lactic acid fermentation release lactic acid only.



Major Pathways of Anaerobic Respiration

22(D). Tapeworm in the host's stomach is NOT an example of a one-sided symbiotic relationship (Commensalism). A tapeworm in the host's stomach is an example of Parasitism.
Symbiosis is a close relationship between two species in which at least one species benefits. For the other species, the relationship may be positive, negative, or neutral. There are three different types of symbiotic relationships:
- Mutualism
- Commensalism(one-sided symbiotic relationship)
- Parasitism

Mutualism: It is a type of symbiotic relationship in which both species benefit. Example: goby fish and shrimp.
Commensalism: It is a type of symbiotic relationship in which one species benefits while the other species are not affected. Example: mites attach themselves to larger flying insects to get a "free ride".
Parasitism: It is a type of symbiotic relationship in which one species (the parasite) benefits while the other species (the host) is harmed. Example: Roundworms are parasites of mammals, including humans, cats, and dogs.

23(C). Syphilis is a sexually transmitted disease caused by the bacterium Treponema pallidum, transmitted through sexual contact or exchange of blood or through the placenta to a fetus.
It includes several stages- 1st stage includes infectious painless ulcers on the genitals.
The 2nd stage includes skin lesions, hair loss, swollen joints.
The 3rd stage includes blindness, heart trouble, aortic impairment.

24(D). Aspergillus are used for the commercial production of citric acid.
Citric acid is the most important organic acid produced in tonnage and is extensively used in the food and pharmaceutical industries. It is produced mainly by submerged fermentation using Aspergillus niger or Candida sp. from different sources of carbohydrates, such as molasses and starch-based media.

25(C). Usnic acid is an antibiotic obtained from Lichens.
An antibiotic is a substance that inhibits the growth of the bacteria or directly kills the bacteria. Usually, many fungi species are identified which have antibiotic properties. For example, penicillin is obtained from a fungus and it is a wide range of antibiotics that kills many bacterial species. Except for fungus, many species of lichens are also reported to synthesize antibiotic compounds like usnic acid. Usnic acid is a yellow crystalline acidic compound having the molecular formula $C_{18}H_{16}O_7$.
It is a naturally occurring antibiotic that is found in many lichen species. The lichens are the symbiotic associations of fungi and algae. These are found growing over barks of trees, stone surfaces, rotting materials, etc. they stay attached to the substratum. Both fungi and algae benefited from this association. They secrete many compounds including antibiotics to sustain their safe development. The usnic acid was found to be synthesized by various lichen species namely Usnea, Cladonia, Alectoria, etc. It is believed that usnic acid in lichens is used to protect them from the harmful effects of sunlight. It is a secondary metabolite of lichens. This means that it is a waste-type secretory product of lichens. Also, the bitter taste of usnic acid protects the lichens from grazing animals.
Note: Many fungal and lichen species secrete antibiotics naturally. The use of antibiotics in the pharmaceutical industry has saved millions of lives from deadly bacterial infections. But due to the un-sustained use of antibiotic medicines, the bacteria have become resistant to them. This is called antibiotic resistance. This causes a greater threat to future health emergencies. Thus, alternatives need to be found.

26(C). Protein synthesis in a cell takes place in cytoplasm as well as in mitochondria. Protein synthesis takes place during the translation process inside the ribosomes. The ribosome is the protein factory of the cell. Ribosomes are found in both prokaryotic and eukaryotic cells. Ribosomes are also found in association

with other cell organelles like mitochondria. The ribosomes are synthesized in the nucleolus. Also, the ribosomes are found attached to the Endoplasmic Reticulum (ER) means they are found freely present in the cytoplasm. 70 S ribosomes are found in the matrix of the mitochondria of both the prokaryotic and the eukaryotic cells. This is because mitochondria are the powerhouse of the cell and the major site for aerobic respiration and ATP production.

27(B). In RNA (Ribonucleic acid) , thymine is replaced by u racil.
This ribonucleic acid acts as a template for the synthesis of proteins, where it transforms the genetic material from the genes to protein synthesis components, to form the amino acids.The nitrogenous bases are purines and pyrimidines. The purines are adenine and guanine. The pyrimidines are thymine and cytosine. In RNA, the thymine is replaced by uracil. Uridylic acid is formed by the combination of uracil as a nitrogenous base, ribose sugar, and triphosphate. It is mainly found in RNA. It is an ester of phosphoric acid with the nucleoside uridine.

28(A). Carrier ions like sodium ions facilitate the absorption of substances like amino acids and glucose.
Glucose and amino acids are co-transported along with sodium ions in the intestinal epithelium. The Na/Glucose co-transporter (SGLT 1) facilitates glucose-coupled sodium absorption while amino acid-coupled sodium absorption occurs through the epithelial cells with the help of sodium/ amino acid co-transporters. There are specific co-transporters for different classes of amino acids.

29(B). The male reproductive system in cockroaches consist of a pair of testes, a pair of vas deferens, ejaculatory duct, seminal vesicle, mushroom glands, and external genitalia. **Testes** are present at 4^{th} -6^{th} segments while the **mushroom** gland is present in 6^{th} -7^{th} segments. The female reproductive system consists of a pair of ovaries, a pair of oviducts, a common oviduct i.e., vagina, genital chamber and external genitalia. The genital chamber shows the opening of spermathecae which is a storehouse of sperms. **Ovaries** extend from 2^{th} - 6^{th} segments and show many tubules known as ovarioles. **Spermathecae** is in the 6^{th} segment.

30(A). Fertilization results in the formation of a zygote that takes place in the oviduct. This zygote then undergoes a series of changes before it actually gets implanted in the uterus. Zygote first undergoes cleavage and results in the formation of 16 cells known as a **morula** . This is a solid ball and is represented by **figure a** . The morula then enters the uterus and undergoes changes. The 16 celled morula further forms 32 cells and these then start arranging in two layers: outer trophoblast and inner embryonal mass. This also forms a cavity and is known as a blastocyst and the structure is known as a **blastula** . This now gets implanted in the uterus. Thus **figure b** is a blastocyst.

31(C). Corpus luteum is the yellow endocrine body formed in the ovary at the site of a ruptured Graafian follicle, while macula lutea is a yellow spot on the retina. The common feature between the two is that both (corpus luteum and macula lutea) are characterized by yellow colour.

32(B). Syngamy is the phenomenon of cell formed by fusion. The fused cell has double the content of the individual cell. Syngamy is commonly called fertilization resulting in formation of zygote. Syngamy is commonly seen in sexual reproduction where two gametes fuse to form zygote.
In certain organisms, small buds are produced attached to the parent organism which grow and eventually separate to develop into new organism. Fragmentation is a type of asexual reproduction where the body of the organism breaks into pieces and each piece gives rise to whole new organism. These processes are types of asexual reproduction.

33(C). Reproduction is the process of producing fertile offspring which look similar to parents. The individual organisms which are the same morphologically and genetically are called clones. They are formed in the asexual reproduction process. Asexual reproduction is a mode of reproduction where offspring is produced by a single parent without the requirement of gamete formation and fertilization. The offspring formed are exactly same as parents because they inherit all the chromosomes of their parent in the same pattern without any mixing.

34(B). The life span of sperm after ejaculation depends on the circumstances. Ejaculated sperm remain viable for several days within the female reproductive tract. Fertilization is possible as long as the sperm remain alive for up to 5 days. Sperm can also be preserved for decades when semen is frozen.

35(D). All of the living organisms are made up of cells. Cells can give rise to new cells by cell division. Each cell has a particular life span. Cells possess machinery, enzymes to form living protoplasm from non-living materials.
For example, plant cells take up CO_2 and O_2 from the environment and make food in the presence of sunlight. Animal cells break down or oxidize glucose and form ATP.
Such ATPs are used as energy currency in cell and various processes of cell formation organelle are carried out.

36(A). Formation of ribosomes is a function of the ''Nucleolus''.
The Nucleolus is a spherical and membrane-less structure so that the content of the nucleolus is continuous with the rest of the nucleoplasm. It is the site for active ribosomal RNA (rRNA) synthesis. Because of the production of ribosomes nucleolus is also called the ''ribosomal factory''
Nucleolus usually attached to chromatin (or chromosomes) at a specific site called the Nucleolar organizer region/NOR. The number of nucleolus in a nucleus is one. Onion cell has 4, and in oocytes of amphibians has 2000 nucleoli. The human cell has 5 nucleoli.

37(D). The main feature of heterosis is:
The F1 hybrid obtained will exhibits superiority over both parents in yield, adaptation, quality and maturity because when two plants having different characters are crossed the F1 hybrid can acquire the superior desired characters of both the parents. For example, one parent has a higher yield while the other parent has greater disease resistance now the F1 progeny obtained may acquire both the characters and become superior.
Heterosis results in phenotypic superiority like increased height, yield and fertility but it is totally under genetic control because all these characters are expressed by the concerned genes only. The possible genetic causes of heterosis are: Partial to complete dominance, overdominance & epistasis. The superiority is reproducible in a specific environment only
Therefore, the correct answer is ''all of these''

38(B). Fibrous roots are not a characteristic of dicotyledons plants. Its roots develop from the radicle and the seed has two cotyledons or embryonic leaves. Their leaves have reticulate venation and have a pentamerous and tetramerous flower. Examples: mustard, bitter gourd, watermelon, brinjal, apple, mango, tamarind, etc.

39(B). Respiration in Limulus takes place through Book-gills. Book-gills are flap-like appendages that affect gas exchange within the water and seem to have their origin as modified legs. On the inside of each appendage, over 100 thin page-like membranes, lamellae, appearing as pages in a book, are where gas exchange takes place.

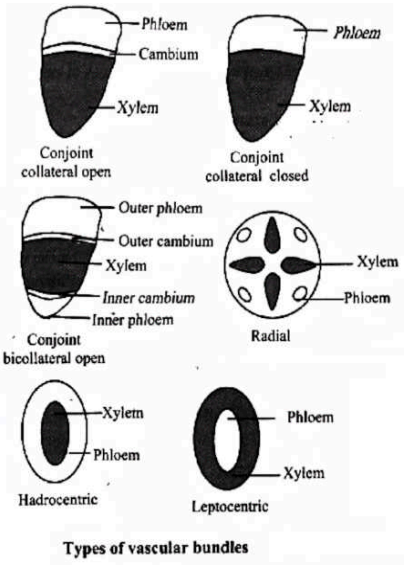
40(B). These fibres are cylindrical in shape is NOT the characteristic feature of Smooth Muscle Fibres.

Smooth muscle is an involuntary non-striated muscle found in the walls of hollow organs, such as the intestines, uterus and stomach. These fibres are spindle-shaped and are pointed at both ends.
They bear a single nucleus which is central. These are involuntary in nature and are also found in the tracts of the urinary, respiratory and reproductive systems. These muscles also play an important role in the ducts of exocrine glands.

41(A). Ciliated epithelium is present in the trachea.
Ciliated columnar epithelial cells are rectangular in shape and have between 200 to 300 hair-like protrusions, called cilia. Cells are interconnected via desmosomes and tight junctions. Ciliated columnar epithelial cells are found mainly in the tracheal and bronchial regions of the pulmonary system and also in the fallopian tubes of the female reproductive system.

42(C). The pseudostratified epithelium is present in the trachea and bronchi. The pseudostratified epithelium is a type of epithelium that, though comprising only a single layer of cells, has its cell nuclei positioned in a manner suggestive of stratified epithelia. The nuclei of these cells, however, are disposed at different levels, thus creating the illusion of cellular stratification. Not all ciliated cells extend to the luminal surface, such cells are capable of cell division providing replacements for cells lost or damaged. Pseudostratified epithelial function in secretion or absorption. If a specimen looks stratified but has cilia, then it is a pseudostratified ciliated epithelium, since stratified epithelia do not have cilia.

43(B). Vascular bundles in a dicot leaf are conjoint, collateral and closed.
Vascular bundles are present within the mesophyll tissue. They represent the midrib and veins of a leaf. Each vascular bundle consists of xylem and phloem complex tissues surrounded by bundle sheath. In a dicot leaf, as xylem and phloem are present on the same radius, the vascular bundle is described as conjoint and collateral. The vascular bundle is described as closed as there is no cambium present between the xylem and phloem. Vascular bundles help in the transport of water, minerals, and food in the leaf. Vascular bundles also provide strength to the leaf.



Types of vascular bundles

44(C). Insects have compound eyes.
Insects like bees and mosquito's eyes are different from human eyes. Bees and mosquitos can see different direction at the same time because their eye has so many tiny lenses. The particular organs of each animal get evolved according to their need and the surrounding environment. They adapt themselves according to their environment, their movement, and their way to feed themselves.
Mosquitos and insects need to fly in the open air and catch their prey so they need to have a vision in different directions at the same time.

45(C). There are 23 chromosomes in the human female germ cell. Chromosomes in the nucleus of a cell contain information for the inheritance of features from parents to the next generation in the form of DNA (Deoxyribonucleic Acid) molecules.
- The important things to remember are that chromosomes, as well as genes, occur in pairs.
- In a multicellular organism, the reproductive cells are called germ cells.
- The motile germ cell is called the male gamete and the germ-cell containing the stored food is called the female gamete.

46(A). Deoxyribonucleic acid (DNA) is a nucleic acid and is therefore made up of nucleotide.
- Each nucleotide consists of a phosphate group, a nitrogenous base (A, T, G, C), and ribose sugar (deoxyribose in case of DNA).
- A nucleoside contains only pentose sugar and a nitrogenous base.
- Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) are the two types of nucleic acids found in living systems.
- DNA is a long polymer of deoxyribonucleotides.
- The length of DNA is usually defined as the number of nucleotides (or a pair of nucleotides referred to as base pairs) present in it.

47(D). Genes are the units of heredity and are the instructions that make up the body's blueprint. They code for the proteins that determine virtually all of a person's characteristics.
Humans have an estimated 35,000 genes. Most genes come in pairs and are made of strands of genetic material called deoxyribonucleic acid, or DNA.
Genetic disorders are caused by one or more changes, or mutations, in the instruction code of a particular gene(s), preventing the gene(s) from functioning properly.
- The study of human genetics is the study of human variation that is carried in the genes.
- The physical location of a gene is its locus. Different versions of genes are called alleles. For example, an eye color gene may have a blue allele and a brown allele.
- Genes are organized in structures called chromosomes.

48(A). Darwin proposed a theory of evolution called natural selection in the year 1859. According to it those populations which are a better fit (reproductively fit) in an environment will be selected by nature and will survive more. Darwin conducted a sea voyage in a sailing ship called H.M.S Beagle as a part of his experiments on the theory of evolution. Charles Darwin concluded that existing living forms share similarities to varying degrees not only among themselves but also with life forms that existed millions of years ago
Darwin's theory of natural selection is popularly known as 'Darwinism'. The evolution by natural selection, in a true sense, would have started when cellular forms of life with differences in metabolic capability originated on earth.
- Darwin went to the Galapagos Islands during his journey.
- Branching descent and natural selection are the two key concepts of Darwinian Theory of Evolution
- The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats) is called adaptive radiation.
- Darwin's finches represent one of the best examples of adaptive radiation.

49(A). There are XX Chromosomes in females and XY Chromosomes in males.
The male chromosome decides the sex of the zygote which develops into young ones. When X-Chromosome inherited from the father it develops into a girl. When Y-Chromosome inherited from the father it develops into a boy.