

Biology Review Questions for Grade 11&12

1. In which one of the following cell organelles and its function are not correctly matched?

- A. Mitochondria-sites of most of the reactions of aerobic respiration
- B. Rough ER-manufacture and transport of proteins
- C. Golgi body-modifies protein and distributes to the appropriate part of the cell
- D. Ribosome-digest worn out or damaged organelles as well as engulfed bacteria

Ans: D. Ribosomes. Ribosomes are the site of protein synthesis from amino acids. The function described under choice D is the role of Ribosomes.

2. In eukaryotic cell nucleus controls the metabolic activities of the cells. This is because nucleus contains

- A. RNA B. DNA C. Enzymes D. Nucleolus

Ans. B. DNA is the genetic material contained in the nucleus. The code for a protein is specified by DNA. In other words, DNA carries the instructions needed to make (Synthesis) a vast array of proteins

3. Which one of the following cellular structure **is not** common feature to both prokaryotic and eukaryotic cells?

- A. DNA B. Ribosomes C. Cell wall D. Membrane bound nucleus

Ans: D. Membrane bounded organelles such as nucleus, mitochondria, and chloroplast are found only in eukaryotic cells.

Homework

1. Please refer to figure 4.14, 4.15 and 4.16 page 121-122 and list all the structures
- A. found only in plant cells
 - C. Found in plant and animal cells
 - B. Found only in animal cells
 - D. found in both prokaryotic and eukaryotic cells

4. If a suspension of a mixture of cellular organelles is spun in a centrifuge, which organelles settles to the bottom at last?

- A. Ribosomes
- C. Mitochondria
- B. Chloroplasts
- D. Nuclei

Ans. A. Ribosomes

Biologists have been able to study the different cell organelles using a technique called cell fractionation.

5. According to endosymbiont theory that explains the origin of eukaryotic cells, which cell organelle was a free living cell before eukaryotic cells evolved?

- A. Ribosome
- B. Chloroplast

- C. Nucleolus
- D. Nucleus

Ans: B. Chloroplast

The heterotrophic and the fore runners of animal, fungal and protist cells with their primitive mitochondria also engulfed other smaller prokaryotic cells. These were prokaryotic cells that could photosynthesize and would in time evolve into chloroplast. Refer page 122-123 of your text.

6. What will happen if plant cells are kept in hypotonic solution?

- A. lose water by osmosis and burst
- B. loss of water by osmosis and shrink
- C. take in water by osmosis, swell and burst
- D. Take in water by osmosis, swell and remain turgid

Ans: D. When a cell is placed in hypotonic solution the net movement of water by osmosis is from outside to inside across the plasma membrane.

7. Why small cells are efficient in obtaining the resources it needs than large sized cells

- A. Because small cells have large volume and small surface area
- B. Small surface area to volume ratio
- C. large surface area to volume ratio
- D. More activity than large cells

Ans. C. Large surface area to volume ratio.

Surface area to volume ratio is important because it is a measure of how efficient the cell is in obtaining the resources it needs.

8. In which transport process ions and medium sized, non-lipid soluble particles move across plasma membrane from their lower to higher concentration using energy from the cell metabolism.

- A. Facilitated diffusion
- B. Active transport
- C. Endocytosis
- D. Exocytosis

Ans. B. Active transport

Simple diffusion, osmosis and facilitated diffusion occur across plasma membrane from higher to lower concentration using the kinetic energy of the particles. They are called passive processes.

Active transport, endocytosis and exocytosis occur across plasma membrane using energy from the cell metabolism.

9. Organelles in the cytoplasm that are known as 'suicide bag' of the cell are

A. Ribosomes B. Golgi body C. Lysosomes D. Mitochondria

C. Lysosomes. It contains powerful digestive enzymes that causes destructing old and worn out organelles and the cell itself. It is also used to clear cellular debris.

10. which molecule is formed in both photosynthesis and cellular respiration?

A. ATP B. Glucose C. Oxygen D. Carbon dioxide

Ans: A. ATP

11. Where does electron transport chain and chemiosmosis take place during cellular respiration?

A. Cytosol C. On the outer membrane surface of mitochondria
B. In the mitochondrial D. On the inner membrane

Ans: D -on the inner membrane surface. The inner membrane surface is folded to increase the surface area. It is known as cristae.

12. Which molecule is used as immediate source of energy for cellular work or chemical synthesis in cells?

A. Glucose B. Pyruvic acid C. ATP D. NADH

Ans: C ATP. ATP is the direct (immediate) energy currency of cells to carry out their activities. when a cell requires energy the bond of the ATP holding the 3rd phosphate group in place breaks and release energy quickly in a single step of hydrolysis reaction.



13. In which stage of aerobic respiration most of the ATP molecules are formed?

A. Glycolysis B. Link reaction C. Krebs's cycle D. ETC and chemiosmosis

Ans: D. ETC and chemiosmosis

14. What is the importance of chemiosmosis in photosynthesis and cellular respiration?

A. Synthesizing ATP C. Operating the proton pump
B. Splitting of water molecule D. Combining hydrogen and oxygen

Ans: A. synthesizing ATP -Chemiosmosis is the diffusion of Hydrogen ions through the ATP synthesis. Each hydrogen ion(proton) that passes through the ATP synthase enzyme causes one molecule of ATP to be synthesized.

15. In which fermentation products enzymes in yeast cells are involved?

A. Wine and beer B. Vinegar C. Yoghurt and cheddar cheese D. Nail polish remover

Ans A. Wine and beer

16. In an experiment to study photosynthesis a plant was provided with radioactive carbon dioxide(C^{14}) as a metabolic tracer and the radioactive carbon was incorporated first into glycerate phosphate. which one of the following would characterize the plant?

A. C_4 plants B. C_3 Plants C. CAM Plant D. Either C_4 or CAM plant

Ans: C_3 plant.

In the light independent reaction of C_3 photosynthesis CO_2 reacts with ribulose biphosphate (RUBP) in the mesophyll cells two molecules of glycerate phosphate (GP) are formed. The reactions catalyzed by the enzyme Rubisco (Rubisco Bis Phosphate carboxylase oxygenase enzyme).

17. During photosynthesis Oxygen is produced from

A. Reduced NADP

B. Splitting of the water molecule

C. the fixation of Carbon dioxide to RUBP or PEP

D. Electron transport system of photosystem II

Ans: B. Splitting of water molecule. It takes place in photosystem II during the light dependent reaction

$2 H_2O \xrightarrow{\text{light}} 4 H^+ + O_2$ = NADPH and ATP are produced in the light dependent reaction of photosynthesis.

18. Which one of the following factors influence directly rate of both light dependent and light independent stage of reactions of photosynthesis?

A. Light intensity

C. Carbon dioxide concentration

B. Temperature

D. The wavelength of a light

Ans. B -Temperature Both the light dependent and the light independent stage are controlled by enzymes, which are affected by temperature.

19. Under which of the following group can protozoa and fungi be more conveniently placed?

A. Prokaryotes B. Plants C. Heterotrophs D. Autotrophs

Ans C. Heterotrophs because they do not make their own organic food from simple inorganic substances using light energy or energy from chemical reactions.

20. Which one of the following is not the important role played by microorganisms such as bacteria and fungi?

- A. Vaccine and antibiotic production
- B. Recycling of nutrients
- C. Forming organic substances
- D. Supplying energy to the ecosystem

Ans: D Supplying energy to the ecosystem

The primary source of energy in the eco system is light energy. This energy is converted to chemical energy (food) by photosynthetic organisms. Then in the ecosystem, it passes from one to organism to another as one eats and then eaten by the other organism on the food chains.

Energy is continually lost as heat from the ecosystem and must be replaced as light. i.e. there is no energy cycle in the ecosystem.

21. To which of the following groups do those bacteriophages causing the host cell to burst and release the viruses all at once belong?

- A. Lytic viruses B. Virulent viruses C. Lysogenic viruses D.non-parasitic viruses

Ans A. Lytic virus: The virus injects its genetic material or DNA into the bacterium. The virus DNA controls the production of more viral DNA and protein coats.

-After assembly the new virus particles (virion) causing the cell to burst and realize the viruses all at once (please refer page 30 your grade 12 textbook)

22. What is the nutritional mode of those bacteria and fungi that get nutrients from their living host?

- A. Symbiotic B. Autotrophic C. Parasitic D. Saprobiotic

Ans: C Parasitic They live in or on the body of living organisms. They get shelter and the nutrient they require for their metabolic activities from their living host. They may cause diseases

23. Which of the following groups of bacteria consists of spherical shaped bacteria?

- A. Bacilli B. Cocci C. Spirilla D. Gram -ve

Ans. B. Cocci

27. which one of the following human diseases is not correctly matched with its mode of transmission?

- A. Sleeping sickness -vector
- B. Pneumonia -droplet infection
- C. Hepatitis B- blood to blood contact or sexual intercourse
- D. Salmonellosis-drinking contaminated water

Ans: D. Salmonellosis, typhoid fever, and botulism are examples of diseases transmitted by eating contaminated food. Pneumonia, Tuberculosis, and Common cold are examples of diseases transmitted by droplet infection.

28. Which of the following is not an example of a cell formed by duplication division?

- A. Kidney cells
- B. Liver cells
- C. Egg cells
- D. Bone cells

Ans: C. Egg cells: Sex cells such as sperm cells and egg cells are formed in germ cells of gonads by reduction (meiosis) cell division. Therefore, the number of chromosomes in sex cells is one set or half no of the chromosomes (n) of the original cell. Such cells are known as haploid cells. This is important to have consistent no of chromosomes in a species from generation to generation.

Sperm cell (n) number of chromosomes + Egg cell (n) → Zygote (2n) number of chromosomes

29. Which type of point mutation causes the human genetic defect known as sickle cell anemia.

- A. Deletion
- B. Substitution
- C. Addition
- D. Chromosome inversion

Ans: B. Substitution

- Please note the different types of chromosome mutations and their possible consequences. (Refer page 156-157 of your text grade 12).

30. During DNA replication which enzyme breaks the hydrogen bonds and 'unwind' part of the helix of the DNA molecule?

- A. DNA polymerase
- B. Reverse transcriptase
- C. DNA Helicase
- D. RNA polymerase

Ans: C. DNA helicase

31. If two parent plants with genotypes 'Tt' are cross bred, what proportion of the offspring will have phenotypes exactly like that of their parents?

- A. 100%
- B. 75%
- C. 50%
- D. 25%

Ans: B-75%

Exp: Allele for tallness is dominant (T) over shortness (t).

Possible combination of gametes Result

X	T	T
T	TT	Tt
T	Tt	Tt

Result

$\frac{3}{4}$ tall -75%

$\frac{1}{4}$ short 25%

Phenotype ratio of the off springs

TT=1-1/4%*100=25%

Tt=2-2/4*100=50%

tt=1-1/4*100=25%

Genotype ratio of the off springs

32. Red green color blindness is a sex-linked disorder. If green red color-blind man marries the daughter of a color-blind person, the probability of their progeny to be red green color blindness is

- A. 100% B. 50% C. 25% D. 75%

Ans: B. 50%

The alleles or the gene that determine red green color blindness is found only on X chromosomes and it is recessive allele.

-Men only have one X chromosome (XY)

-Women have two X chromosomes.

Gametes X^1Y * X^1X

↓ ↓ * ↓ ↓

X	X^1	X
X^1	X^1X^1	X^1X
Y	X^1Y	X Y

33. A group of organisms that are genetically identical to each other and to the organism from which they were derived is said to be

- A. Clones B. Hybrids C. Mutants D. transgenic

Ans: A. Clone

34. If allowed to self-pollinate, which of the following pea genotype would produce progeny with 75% or 12 round, yellow seed phenotype and 25% or 4 wrinkled, green seed phenotype?

A. Rr Yy B. Rr yy C. RR Yy D. Rr YY

Ans: B Rr yy

Parent's genotype Rr yy * Rryy

Possible gametes Ry, Ry * Ry Ry, rryy

rryy

Possible combination of gametes

X	RY	RY	Ry	ry
Ry	RRyy	RRyy	Rryy	Rryy
Ry	RRyy	RRyy	Rryy	Rryy
Ry	Rryy	Rryy	Rryy	rryy
Ry	Rryy	Rryy	Rryy	rryy

wrinkled green

Please find the possible phenotype ratio of the off springs if parents given in choice A, C and D self-pollinate?

35. For what purpose do molecular biologists use DNA ligase enzyme?

A. To insert DNA into plasmids

B. To multiply copies of DNA molecule

C. To produce DNA from RNA

D. To open the plasmid and cut the gene to be transferred from the donor DNA

Ans: A . to insert DNA into plasmids

36. When the F1 dihybrid such as Rr Yy is back crossed with homozygous recessive parent, what percentage of the offspring would be homozygous recessive (rryy)?

A. 25% B. 0% C. 50% D. 75%

Ans: A. 25%

Let us check using Punnett square

-F1 dihybrid → given Rr Yy is crossed with homozygous recessive (rryy)

-Genotype of the parents Rr Yy * rryy

-Possible gametes formed Ry.Ry * ry,ry,ry,ry

ry.ry

X	Ry	ry	Ry	ry
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RY	RrYy	Rr Yy	Rr Yy	Rr Yy
RY	Rr Yy	RrYy	RrYy	Rr Yy
Ry	RrYy	Rryy	Rryy	Rryy
ry	Rryy	rryy	rryy	rryy

As you can see in the above Punnett square rryy (homozygous recessive progeny) is 4/16. That means $\frac{1}{4}$ or 25% of the total no of offsprings.

37. Which three nitrogenous bases belong to the pyrimidines?

- A. Adenine, guanine and uracil
- B. Cytosine, thymine and uracil
- C. Adenine, thymine and cytosine
- D. Guanine, thymine and uracil

Ans: B-cytosine, thymine and uracil. They have single ring in their molecule.

* Adenine and guanine are purine bases. Purine bases have double rings in their molecule

-They are found both in the nucleotides of DNA and RNA.

38. If a DNA molecule contains 20% guanine, what is the percentage of adenine?

- A. 20% B. 30% C. 80% D. 60%

Ans: B. 30%

DNA is a double stranded molecule made from two antiparallel polynucleotide strands. The nucleotides in one strand are paired with nucleotides in the other according to the base pairing rule. Adenine paired with thymine and guanine paired with cytosine.

39. Which of the following mating produces children all having the same ABO blood phenotypes?

- A. AO X AB B. BB X OO C. AO X BO D. AA X BO

Ans: B - BB X OO. Allele that determines blood type B (I^B) is dominant over allele I^O . Allele that determines blood type A is dominant over allele that determines blood type O (I^O). But neither allele A nor allele B are dominant over the other. They are codominant to each other.

BB X OO

X	O	O
B	BO	BO
B	BO	BO

Children all having phenotype O and genotype BO

40. In the process of protein synthesis in eukaryotic cells, translation occurs in the _____

- A. Nucleus C. Ribosomes
- B. Nucleolus D. Lysosomes

Ans: C. Ribosomes .In the nucleus transcription takes place and m RNA is produced which carry the genetic code to the ribosomes.

-In the ribosomes translation takes place and amino acids assembled into poly peptide chain that forms different types of protein depending on the genetical sent by DNA through m RNA.

41. Suppose the amino acid coding region in m RNA is 1500 nucleotides long. How long is the protein in terms of the amino acid number?

- A. 1500 amino acids B. 7500 amino acids C. 500 amino acids D. 300 amino acids

Ans: 500 amino acids. Each amino acid is coded for by triplet or sequence of three bases. Therefore, if there are 1500 nucleotides or nitrogenous bases, $1500 / 3 = 500$ amino acids are coded, and the protein synthesized in the process is expected to contain 500 amino acids.

42. Which of the following is not a characteristic of an enzyme?

- A. It is specific in its action
- B. It is a globular protein
- C. It increases the energy of activation
- D. It is by the temperature and P^H of the medium affected

Ans: C. It increases the energy of activation. Activation energy is the energy required to start off a chemical reaction.

Enzyme is a catalyst that lowers the activation energy required for a reaction and so the reaction proceeds more quickly. Non catalyzed reactions require more activation energy and the reaction proceeds slowly.

43. In a certain metabolic pathway ($A \rightarrow B \rightarrow C \rightarrow D$), where each step is catalyzed by a separate enzyme, if the concentration of the final product D tends to increase above the required level, product D inhibits the enzyme controlling the first stage of the reaction sequence. The controlling mechanism is an example that shows the importance of particularly _____

- A. Noncompetitive inhibitors C. irreversible inhibitors
- B. Competitive inhibitors D. any type of inhibitors

Ans: A. noncompetitive inhibitors. They are particularly important in regulating metabolic pathways. When the end product (D) is depleted the inhibition can be removed.

48. Into which of the following organic compounds can cellulase, amylase and Sucrase be grouped?

A. Carbohydrates B. Proteins C. Nucleic acids D. Lipids

Ans: B-Proteins- Enzymes are globular proteins. Cellulase, amylase and Surcease are examples of enzymes that digest or hydrolyze Carbohydrates.

49. For biological detergent to effectively remove oily and greasy dirt, which of the following enzymes should it contain?

A. Protease B. Amylase C. Cellulase D. Lipase

Ans: D Lipase because it is a lipid digester enzyme. Oil and grease are lipids amylase is for starch. Cellulase is for cellulose and protease is for proteins.

50. Which one of the following **is not** the appeals of using enzymes in industrial processes?

A. Reduces the costs involved

B. Reduces the carbon dioxide emissions

C. Help to prevent local or global warming

D. Increases the quantity of product with the same quantity of resource as that of uncatalyzed reaction.

Ans: D Enzymes increase the rate of the chemical reaction. If the same quantity of resource is used equivalent quantity of the product is formed in both catalyzed and uncatalyzed reaction. But the advantage of using enzymes in the industry is to reduce cost, CO_2 emission and to save time.

51. Which of the following is not a pentose sugar?

A. Ribosome B. Ribulose C. Deoxyribose D. Glyceraldehyde

Ans: D Glyceraldehyde. It is a triose monosaccharide meaning it has three Carbon atoms, with the formula $\text{C}_3\text{H}_6\text{O}_3$ → Ribose, ribulose and deoxyribose are monosaccharaides that have Carbon atoms with the formula $\text{C}_5\text{H}_{10}\text{O}_5$.

52. How many molecules of fatty acids, glycerol and phosphate group, respectively are needed to form 10 molecules of phospholipid?

A. 30, 10 and 10

C. 20, 10 and O

B. 20, 10 and 10

D. 10, 10 & 10

Ans: B. 20, 10 and 10

A phospholipid molecule is formed from two fatty acids, one glycerol and one phosphate group. 10 molecules of phospholipid are formed from 20 fatty acids, 10 glycerol and 10 phosphate group molecules.

53. A carbohydrate compound that contains 3 to 6 carbon atoms in the whole molecule is known as

- A. Polysaccharide
- B. Disaccharide
- C. Monosaccharide
- D. Polypeptide

Ans: C Monosaccharide. Monosaccharides can be classified depending on

- 1. How many number of carbon atoms are present in the molecule and
- 2. The functional group that they possess

Please define the term isotype and write the isotope of triose, tetrose, pentose and hexose monosaccharides?

54. If a certain food stuff gave a positive result with emulsion test and a positive result with Benedict's test after it was hydrolyzed with hydrochloric acid which of the following substances could be?

- A. Protein and reducing sugar
- B. protein and non-reducing sugar
- C. protein and lipid
- D. reducing and non-reducing sugar

Ans: B Protein and non-reducing sugar

55. Which of the following classes of organic molecules are not source of energy for cellular respiration?

- A. Lipids and proteins
- B. Carbohydrates and lipids
- C. Vitamins and minerals
- D. Carbohydrates and proteins

Ans: C vitamins and minerals

Carbohydrates, proteins and lipids are energy containing nutrients that can survive as respiratory substrates. Vitamins, minerals and water, even though they are vital to living things, they do not provide energy cells. They are known as non-energy containing nutrients.

56. Which one of the following choices include elements that are not most common in many cells?

- A. Hydrogen
- B. Oxygen
- C. Carbon and nitrogen
- D. Sulphur and phosphorous

Ans: D. Sulphur and phosphorous.

Many cells contain about 59% hydrogen, 24% Oxygen, 11% Carbon, 4% Nitrogen and 2% other elements such as phosphorous and Sulphur

57. Which of the following is not considered as a structural bio-chemical molecule

A. Starch B. Cellulose C. Chitin D. Phospholipid

Ans: A Starch

Starch and glycogen are storage carbohydrates. starch in plants and glycogen in animals and fungi.

58. Which of the following is a functional group of monosaccharides?

A. An amino acid group C. Hydroxyl or amino group
B. A Carboxyl Group D. An aldehyde or a ketone

Ans: D an aldehyde or a Ketone group

59. One of the following is a non-protein molecule

A. Keratin C. Hemoglobin
B. Lipase D. Wax

Ans: D -Wax :Wax is a lipid molecule.

60. When glucose molecules are joined by β -linkage which of the following carbohydrate is obtained?

A. Glycogen B. Cellulose C. Starch D. Maltose

Ans: B cellulose. Cellulose is a polymer of β -glucose molecules joined by β -1,4-glycosidic bonds formed by condensation reactions. It is an unbranched molecule. Starch and glycogen are polymers of α -glucose molecules.

61. Which of the following is generally expected to give better health benefits when present in our diet.

A. Triglyceride that contains high proportion of poly unsaturated fatty acids
B. Monounsaturated fatty acids
C. Saturated fatty acids
D. Animal fat

Ans: A Poly unsaturated fatty acid $\rightarrow$ because they help to prevent cholesterol being laid down in the linings of arteries (arteriosclerosis) and so help to prevent heart disease.

62. Suppose in an experiment conducted to test a new drug, 50 people were given the drug and 50 people a placebo. What is the experimental group of the experiment?

- A. People who received the new drug
- B. People who received the placebo
- C. The new drug itself
- D. The new drug and the placebo

Ans: A People who received the new drug. Experimental group - part of an experiment which is being experimented on in order to compare with the control group.

63. Which of the following field equipment is used to measure the slopes of an area or the height of a tree?

- A. Global positioning system (GPS)
- B. Theodolite
- C. Pitfall traps
- D. a data logger

Ans: B Theodolite

Home work: list laboratory tools and some other field tools that biologists use in the field?

64. The process by which scientist approach their work is _____

- A. Experiment science
- B. Applied science
- C. Scientific Experiment
- D. Scientific method

Ans: D Scientific method. It consists of a number of stages. The main stages include

Identifying the problem (asking question) → do background research → construct hypothesis → Test with an experiment → analyse the result and draw conclusion → accept or reject is true or false or partially true and try again.

65. In scientific experiment a factor that **cannot** be controlled which may influence the result of the experiment is _____

- A. Independent variable
- B. Confounding variable
- C. Controlled variable
- D. Dependent variable

Ans: B confounding variable

E.g. If you measure the carbon di oxide uptake by a certain plant as the light intensity changes over the day, you cannot control the effect of a change in temperature. Temperature could be confounding variable.

66. What do we call a scientist who specializes in studying about the ways in which life began on earth and how it was evolved from simple life forms into more complex ones?

- A. An Oncologist C. An Astrobiologist
B. A physiologist D. A Paleobiologist

Ans: An Oncologist: is a doctor who treats cancer and provides medical care for a person diagnosed with cancer.

67. Which of the following step of the scientific method comes before all the rest?

- A. Identifying the problem C. Hypothesis
B. Background research D. Experiment

Ans: A- identifying the problem. The correct sequence is

Identifying the problem → background research → hypothesis → experiment

68. Standardizing all the procedures, repeating the experiment many times and minimizing personal judgment are a means to increase _____

- A. the validity of an experiment
B. the accuracy of an experiment
C. the reliability of an experiment
D. Validity and accuracy of an experiment

Ans: C the reliability of an experiment

69. What is the advantage of using highly active anti-retroviral therapy for the treatment of HIV?

- A. It helps to break the life cycle of HIV
B. It gives a lasting immunity to HIV
C. It prevents re-infection by HIV
D. It helps to get cure from HIV

Ans: A It helps to break the life cycle of HIV by acting on different stages of replication in the host cells.

70. Which of the following properties of water makes it ideal for transport medium in living things

- A. Its high surface tension C. Its high specific heat capacity
B. Its high latent heat of vaporization D. Its viscosity

Ans C: Its highly specific heat capacity. Because it takes quite a lot of energy to heat up and loses heat quite slowly so that it helps to maintain more or less optimum temperature in living cells.

71. What is the ultimate source of all scientific knowledge?

- A. Observation
- B. Guessing
- C. Trial and Error
- D. Observation and experimentation

Ans D-Science is a unique system of acquiring knowledge based on scientific method.

72. Which of the following tools is used by biologists to culture microorganisms such as bacteria and plants?

- A. Dissecting kit
- B. Petridish
- C. Centrifuge
- D. Syringes

Ans: Petridish

73. In which one of the four phases of population growth is the number increase rapidly?

- A. Decline phase
- B. Lag phase
- C. Log phase
- D. Stationary phase

Ans: Log phase: Because all the organisms are adapted and reproduce rapidly due to plentiful resources. There is geometric or exponential growth. The population doubles in each time period.

74. Which one of the following is not the reason for the high species richness of the fauna and flora observed in Ethiopia?

- A. presence of several biomes within the country
- B. efficient management of the ecological resources and lack of disturbance
- C. isolation of the high lands within the country
- D. the presence of wide range of attitude and climate

Ans: B. efficient management of the ecological resources and lack of disturbance. Instead of this, there is undervaluation of the biodiversity resources, the legal and institutional systems promote unsustainable exploitation.

75. Which of the following concepts contain all the others?

- A. Population
- B. Community
- C. Ecosystem
- D. Biosphere

Ans: D Biosphere: refers to all those parts of the earth's crust, water bodies and atmosphere, where living organisms can be found. It is integration of all the world's ecosystem.

76. If the age pyramid of a country is narrow at the base and wide at the apex, the population of the country is

- A. Expanding
- B. Decline
- C. Static
- D. Exploding

Ans: B Decline. Because it shows low birth rate.

77. Which one of the following choices include crop plants whose center of origin and diversity **is not** in Ethiopia?

- A. Maize, wheat and potato
- B. Coffee, Teff and Enset
- C. Anchote, Nigarseed, Gomenzer
- D. Sorghum, Barely and linseed

78. Which of the following **is not** the correct characteristics of tropical rain forest?

- A. Warm temperature and heavy rain
- B. Hot temperature and low biodiversity
- C. Poor, thin soil and trees of different heights
- D. Heavy rain and high biodiversity

Ans: B: Hot temperature is the characteristics of hot desert and thorn forest.

79. Which one of the following **is not** the future effect of the current trees planting activities that Ethiopia is undertaking?

- A. It will protect from harmful solar rays
- B. It will reduce the atmosphere CO₂
- C. It will reduce soil erosion and siltation in dams
- D. It will increase insecurity of food supply

Ans: B: It will reduce the atmospheric CO₂.

Planting trees increases the rate of photosynthesis by absorbing the CO₂ from the atmosphere and tends to decrease CO₂ and help to prevent global warming.

80. Which of the following **is not true** about the flow of energy in the ecosystem?

- A. It is recycled by decomposers
- B. It leaves the ecosystem in the form of heat
- C. It enters the ecosystem in the form of the light
- D. It passes from one trophic level to the next

Ans: A. It is recycled by decomposers. Decomposers (many bacteria and fungi) released back nutrients held in the bodies of dead animals and plants into the ecosystem (environment) and the nutrients taken in by organisms.

81. Of the following activities, which one **is not** considered to have indirect negative effect on biodiversity?

- A. High population growth
- B. Undervaluation of the bodies these
- C. Legal and institutional systems that promote unsustainable exploitation
- D. Deforestation, for cultivation, charcoal making and monoculture farming

Ans: D. Because they are direct activities that causes loss of biodiversity. In addition, to these fuel woods collection, illegal logging, overgrazing by stock animals, over hunting and introduction of alien invasive species are also direct activities. Those activities listed under choices A to C are indirect activities that cause loss of biodiversity.

82. What is the other name for primary producers of the ecosystem?

- A. Herbivores
- B. Decomposers
- C. Green plants
- D. Carnivores

Ans: C. Green plants. They are the basis of the food chain in different ecosystems.

83. In which cycle of nutrients in the ecosystem the atmosphere or air **is not** involved?

- A. Phosphorous
- B. Carbon cycle
- C. Nitrogen
- D. Sulphur cycle

Ans: A. Phosphorous cycle: It involves soil, feeding, death and decomposition.

84. What does a higher value of Simpson's index of diversity normally indicate to the ecologist?

- A. An area dominated by one or just a few
- B. An area with animals but no species of plants
- C. An area with number of successful species and more stable ecosystem
- D. An area with number of endemic species

Ans: C. An area with several successful species and more stable ecosystem. No species is completely dominant the area and it is less hostile environment.

Index of Diversity can be calculated using the formula $\frac{N(N-1)}{\sum n(n-1)}$

It is known as Simpson index of diversity.

N - total no of organisms in the area
n - total no of organisms of each species in the area.

85. A primary succession differs from a secondary succession to the same climax in that

- A. It requires no pioneer species
- B. It starts from ground that has never been colonized
- C. It usually takes shorter period

D. There is an existing seed bank to draw on

Ans: B. It starts from ground that has never been colonized.

86. A fossil is analyzed using a technique of radioactive carbon (C^{14}) dating and found that it had only 6.23 % its original carbon -40. The age of the fossil is _____

- | | |
|-----------------|----------------------|
| A. 22,920 years | C. 17,190 years |
| B. 28,650 years | D. 5.2 million years |

Ans: A 22,920

87. Which one of the following is not the idea of Lamarck's theory of evolution?

- A. Evolution occurs by natural selection
- B. New structures arise by use and disuse
- C. New features acquired during lifetime of an individuals are passed to the offspring
- D. Developing new features in order to survive

Ans: A. Evolution occurs by natural selection. It is the idea of Darwin's theory of Natural selection.

88. To which genus of primates Lucy is classified?

- | | |
|----------------------------------|--------------------------------------|
| A. The genus of <i>Homo</i> | C. The genus <i>Australopithecus</i> |
| B. The genus <i>Ardipithecus</i> | D. <i>ramidus</i> |

Ans: C The genus name Lucy is *Australopithecus* and the species names is *Afarensis*.

89. The Neo-Darwinism take into consideration all the followings to explain the theory of natural selection except _____

- | | |
|--------------------------|--------------------------------------|
| A. Genes and gene action | C. Biochemistry |
| B. Animal behavior | D. inheritance of acquired character |

Ans: D. Inheritance of acquired characteristics is the main idea of Lamarck's theory of evolution.

90. In which of the following ways does mutation contribute most to evolution?

- | | |
|--------------------------------|-----------------------------|
| A. It helps genes to recombine | C. It creates new alleles |
| B. It preserves adaptive genes | D. It forms a new gene pool |

Ans: C: It creates new genes either by point mutation of chromosomes mutation.

91. If a radioactive substance that weighs one Kilogram has a half life of 200 years, what would be the percentage of the substance left after 800years?

- | | |
|-------|---------|
| A. 50 | C. 12.5 |
| B. 25 | D. 6.23 |

Ans: D: 6.23 %

After the 1st years 200 years -50%

After the 2nd years 200 years -25%

After the 3rd 200 years 12.5 % After the 4th 200 years 6.23%

92. What do you call structures that have the same function but different anatomy and different evolution origin?

- A. Endemic B. Analogous C. Homologous D. Indigenous

Ans: B. Analogous e.g. the wings of birds and wings of insects.

93. Among the following fossil *hominid* species, which one is the youngest of all?

- A. *Homo erectus* C. *Australopithecus afarensis*
B. *Ardipithecus ramidus* D. *Homo neanderthalensis*

Ans: D: *Homo neanderthalensis*

Australopithecus ramidus (oldest) → *Afarensis* → *Homo habilis* → *Homo erectus* → *Homo neanderthalensis*

94. Which photoautotrophs were largely responsible in shifting from the reducing atmosphere to an atmosphere containing oxygen?

- A. green plants B. Cyanobacteria C. Eukaryotes D. Heterotrophs

Ans B. Cyanobacteria (blue green algae)

The fossil record shows that cyanobacteria had been producing oxygen by photosynthesis from about 3.5 billion years ago.

95. What is the reproductive isolating mechanism called if two population of frogs do not interbreed, because they reproduce at different times of the day?

- A. Seasonal isolation C. Temporal isolation
B. Behavioral isolation D. Geographical isolation

Ans: C Temporal isolation

96. In disruptive selection, the selection pressure operates:

- A. In favor of those individuals at one extreme of the range of values for a feature
B. In favor of those individuals showing the mean values for a feature
C. In favor of those individuals in both extremes of the range of values for a feature
D. None of the above

Ans: C In favor of those individuals in both extremes of the range of values for a feature.

97. A yearly based biological clock that contains a cyclical process in an organism is called a

- A. Circannual rhythm C. Circadian rhythm
- B. Lunar rhythm D. Kinesis or taxis behavior

Ans: A. Circannual rhythm. E.g. coat growth in arctic fox, hibernation, migration and camouflage coloring on arctic fox.

98. Of the following patterns of innate behavior in animals, which one is considered the simplest?

- A. Kinesis or movement C. Instinctive behavior
- B. Reflex actions D. Taxis movement

Ans: B: Reflex actions: A single action is performed in response to a specific stimulus.

99. What do you call the learned behavior if a mouse that had just escaped from the mouth of the cat jumped violently at slight touch by trial object?

- A. Habituation C. Sensitization
- B. Insight learning D. Classical conditions

Ans: C. Sensitization is an increase in the response to harmless stimulus when that stimulus occurs after harmful stimulus.

100. A girl after watching her mother making injera on several occasions, she successfully did herself. This type of learning is

- A. Insight B. Latent C. Operant D. Habituation

Ans: B. Latent. Learning is a type of learning when the brain acquires knowledge at a certain time, without reinforcement, but does not use it until later, at a time when a knowledge is needed.

101. In the group of Ethiopian Wolf which does not contribute to territory making with their urine containing phermones?

- A. Adult males C. Subadult males
- B. Adult Females D. Subadult females

Ans: D. Sub-adult females never mark the territory with urine containing phermones.

102. One of the following **is not** true about operant conditioning

- A. It is based on consequences of actions
- B. It is a type of innate behavior
- C. It is based on reward and punishment
- D. It is concerned with learnt behavior

Ans: B. It is a type of innate behavior. Innate is a behavior that is present (Potentially) at birth or hatching. It does not to be learned.

103. How workers bee communicates with each other to convey information about the source and location of the source of nectars?

- A. By pheromones B. By wag dance C. Buzzling noise D. All the above

Ans: B. By wag dance

104. Which of the following **is not** true about instinctive behavior?

- A. It is triggered by a key stimulus
- B. It has a fixed action pattern
- C. It is adaptive for the species
- D. It is not common to all members of a species

Ans: D. Because instinctive behavior is common to all members of species