Biological Classification

Question1

Identify the incorrect pair :

[NEET 2024 Re]

Options:

A.

Sphenopsida - Adiantum

B.

Pteropsida - Dryopteris

C.

Psilopsida - Psilotum

D.

Lycopsida - Selaginella

Answer: A

Solution:

Equisetum belongs to Sphenopsida.

Adiantum belongs to Pteropsida.

Question2

Match List-I with List-II:

	List-I Organisms		List-II Mode of Nutrition
A.	Euglenoid	I	Parasitic
B.	Dinoflagellate	II	Saprophytic
C.	Slime mould	III	Photosynthetic
D.	Plasmodium	IV	Switching between photosynthetic and heterotrophic mode

Choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

A-III, B-IV, C-II, D-I

B.

A-IV, B-II, C-I, D-III

C.

A-IV, B-III, C-II, D-I

D.

A-IV, B-II, C-III, D-I

Answer: C

Solution:

Euglenoids are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs.

Dinoflagellates are mostly marine and photosynthetic.

Slime moulds are saprophytic protists.

Plasmodium is malarial parasite which cause malaria.

Question3

Which of the following pairs is an incorrect match?

[NEET 2024 Re]

Options:

A.

Annelids and arthropods-Bilateral symmetry

B.

Sponges-Acoelomates

C.

Coelenterates and Ctenophores-Radial symmetry

D.

Platyhelminthes-Diploblastic organisation

Answer: D

Solution:

The correct answer is option (4) as it represents an incorrect match because platyhelminthes are triploblastic organisms; not diploblastic.

Option (1) represents the correct match as annelids and arthropods exhibit bilateral symmetry.

Option (2) represents the correct match as sponges are acoelomates.

Option (3) represents the correct match as coelenterates and ctenophores exhibit radial symmetry. Hence, option (1), (2) and (3) cannot be the answer.

Question4

Match List I with List II

	List-I		List-II
A.	Rhizopus	I.	Mushroom
B.	Ustilago	II.	Smut fungus
C.	Puccinia	III.	Bread mould
D.	Agaricus	IV.	Rust fungus

Choose the correct answer from the options given below:

[NEET 2024]

Options:

A.

A-III, B-II, C-IV, D-I

B.

A-I, B-III, C-II, D-IV

C.

A-III, B-II, C-I, D-IV

D.

A-IV, B-III, C-II, D-I

Answer: A

Solution:

Rhizopus is a bread mould fungus. Ustilago is a smut fungi. Puccinia is known as rust fungi. Agaricus is commonly called mushroom.
A-III
B-II
C-IV
D-I

Question5

Which one of the following is not a criterion for classification of fungi?

[NEET 2024]

Options:

A.

Morphology of mycelium

B.

Mode of nutrition

C.

Mode of spore formation

D.

Fruiting body

Answer: B

Solution:

The morphology of the mycelium, mode of spore formation and fruiting bodies form the basis for the division of the kingdom fungi into various classes.

Question6

House fly belongs to family.

[NEET 2023 mpr]

Options:

A.

Cyprinidae

B.

Hominidae

C.

Calliphoridae

D.

Muscidae

Answer: D

Solution:

Option A : Cyprinidae
Cyprinidae is the largest and most diverse family of freshwater fish. It includes carps, goldfishes, minnows, and many other types of fish.

Option B : Hominidae
Hominidae, also known as the great apes or hominids, is a taxonomic family that includes seven extant species in four genera: Pongo (the Bornean, Sumatran and Tapanuli orangutan); Gorilla (the eastern and western gorilla); Pan (the common chimpanzee and the bonobo); and Homo, of which only one species survives, Homo sapiens, or human beings.

Option C : Calliphoridae
Calliphoridae is a family of insects commonly known as blow flies. Many of this family's species are metallic in appearance and are found in a variety of environments.

Option D : Muscidae
Muscidae is a large family of flies that includes a variety of species, one of which is the common housefly (Musca domestica). Houseflies are ubiquitous and are often associated with human habitations. They are known for their potential to spread diseases due to their attraction to waste and decaying organic matter.

Question7

' X ' and ' Y ' are the components of Binomial nomenclature. This naming system was proposed by 'Z' :

[NEET 2023 mpr]

Options:

A.

X-Generic name, Y-Specific epithet, Z-Carolus Linnaeus

B.

X-Specific epithet, Y-Generic name, Z-R.H. Whittaker

C.

X-Specific epithet, Y-Generic name, Z-Carolus Linnaeus

D.

X-Generic name, Y-Specific epithet, Z-R.H. Whittaker

Answer: A

Solution:

The correct answer is Option A : X-Generic name, Y-Specific epithet, Z-Carolus Linnaeus.

Carolus Linnaeus is the scientist who proposed the binomial nomenclature system for naming organisms. This system includes two parts: the generic name (genus) and the specific epithet (species). Therefore, 'X' is the generic name, and 'Y' is the specific epithet.

Question8

Mad cow disease in cattle and Cr Jacob disease in humans are due to infection by
[NEET Re-2022]

Options:

A. Prion

B. Bacterium

C. Virus

D. Viroid

Answer: A

Solution:

Mad cow disease is cattle and Cr Jacob disease in humans are due to infection by Prions which are abnormally folded proteins.

Question9

Given below are two statements :
Statement I : Mycoplasma can pass through less than 1 micron filter size.
Statement II : Mycoplasma are bacteria with cell wall.
In the light of the above statements, choose the most appropriate answer from the options given belo
[NEET-2022]

Options:

A. correct are Both Statement I and Statement II

B. Both Statement I and Statement II are incorrect

C. Statement I is correct but Statement II is incorrect

D. Statement I is incorrect but Statement II is correct

Answer: C

Solution:

Solution:

Mycoplasma are the smallest cells and are only 0.3 µm in length. So it can pass through less than 1 µm filter size.

Mycoplasma lack cell wall.

Question10

In the taxonomic categories which hierarchical arrangement in ascending order is correct in case of animals?
[NEET-2022]

Options:

A. Kingdom, Phylum, Class, Order, Family, Genus, Species

B. Kingdom, Class, Phylum, Family, Order, Genus, Species

C. Kingdom, Order, Class, Phylum, Family, Genus, Species

D. Kingdom, Order, Phylum, Class, Family, Genus, Species

Answer: A

Solution:

Solution:

None of the options are matching with the language of the question The correct ascending order of taxonomic categories in case of animals is

species→ genus → family → order → class → phylum → kingdom

Question11

Identify the asexual reproductive structure associated with Penicillium : [NEET-2022]

Options:

A. Zoospores

B. Conidia

C. Gemmules

D. Buds

Answer: B

Solution:

Solution:

Conidia are the asexual reproductive structures produced in Penicillium.

Gemmules are produced in sponge

Buds are produced in Hydra

Zoospores are produced in Chlamydomonas

Question12

Which of the following is a correct statement? [NEET-2022]

Options:

A. autotrophic organisms classified under kingdom Monera Cyanobacteria are a group of.

B. Bacteria are exclusively heterotrophic organisms.

C. Slime moulds are saprophytic organisms classified under Kingdom Monera.

D. Mycoplasma have DNA, ribosome and cell wall.

Answer: A

Solution:

Solution:

Slime moulds are classified under kingdom Protista.

Mycoplasma lack cell wall.

Bacteria can be autotrophic as well as heterotrophic.

Question13

Which of the following statements is correct ? [NEET 2021]

Options:

A. Fusion of two cells is called Karyogamy

B. Fusion of protoplasms between two motile on non-motile gametes is called plasmogamy

C. Organisms that depend on living plants are called saprophytes

D. Some of the organisms can fix atmospheric nitrogen in specialized cells called sheath cells

Answer: B

Solution:

Solution:
• In some blue-green algae specialised cells called heterocyst fixes atmospheric nitrogen into ammonia.
• Fusion of two nuclei is called Karyogamy.
• Organisms that depend on living plants are parasites, saprophytes grow on dead material.
• Fusion of protoplasts of two cells is called plasmogamy.

Question14

Which of the following is correct about viroids? (NEET 2020)

Options:

A. They have free RNA without protein coat

B. They have DNA with protein coat

C. They have free DNA without protein coat

D. They have RNA with protein coat

Answer: A

Solution:

Solution:
(a) Viroids have free RNA without protein coat. Viroid, an infectious particle smaller than any of the known viruses, an agent of certain plant diseases. The particle consists only of an extremely small circular RNA (ribonucleic acid) molecule, lacking the protein coat of a virus

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Question15

One scientist cultured Cladophora in a suspension of Azotobacter and illuminated the culture by splitting light through a prism. He observed that bacteria accumulated mainly in the region of : (NEET 2019)

Options:

A. Blue and red ligh

B. Violet and green light

C. Indigo and green light

D. Orange and yellow light

Answer: A

Solution:

Solution:
(a) Azotobacter is aerobic bacteria. and Cladophora is green alga.
Engelmann used a prism to split light into its spectral components, and then illuminated a green alga, Cladophora, placed in a suspension of aerobic bacteria. The bacteria were used to detect the sites of oxygen evolution.
He observed that aerobic bacteria accumulated mainly in the region of blue and red light of the split spectrum thus giving the first action spectrum of photosynthesis.

Question16

Match the organisms in column I with habitats in column II.

Column-I	Column-II
(A) Halophiles	(i) Hot springs
(B) Thermoacidophiles	(ii)Aquatic environment
(C) Methanogens	(iii)Guts of ruminants
(D) Cyanobacteria	(iv) Salty areas

Select the correct answer from the options given below :
(NEET 2019)

Options:

A. (A)-(ii), (B)-(iv), (C)-(iii), (D)-(i)

B. (A)-(iv), (B)-(i), (C)-(iii), (D)-(ii)

C. (A)-(i), (B)-(ii), (C)-(iii), (D)-(iv)

D. (A)-(iii), (B)-(iv), (C)-(ii), (D)-(i)

Answer: B

Solution:

(b) Halophiles live in salty areas.Thermoacidophiles are present in hot springs.Methanogens are present in gut of several ruminants.Cyanobacteria can be present in freshwater/ marine or terrestrial habitat.

Question17

Which of the following statements is incorrect?
(NEET 2019)

Options:

A. Morels and truffles are edible delicacies.

B. Claviceps is a source of many alkaloids and LSD.

C. Conidia are produced exogenously and ascospores endogenously.

D. Yeasts have filamentous bodies with long thread-like hyphae.

Answer: D

Solution:

(d) Yeast is an unicellular sac fungi. It lacks filamentous structure or hyphae.

Question18

Which of the following statements is incorrect?
NEET 2019

Options:

A. Viroids lack a protein coat.

B. Viruses are obligate parasites.

C. Infective constituent in viruses is the protein coat.

D. Prions consist of abnormally folded proteins.

Answer: C

Solution:

Solution:
(c) Infective constituent in viruses is either DNA or RNA, not protein. The simplest form consist of two basic components: nucleic acid (single- or double-stranded RNA or DNA) and a protein coat, the capsid, which functions as a shell to protect the viral genome from nucleases and which during infection attaches the virion to specific receptors exposed on the prospective host cell.

Question19

Mad cow disease in cattle is caused by an organism which has : (NEET 2019)

Options:

A. Free DNA without protein coat

B. Inert crystalline structure

C. Abnormally folded protein

D. Free RNA without protein coat

Answer: C

Solution:

Solution:
(c) Prions are disease causing agents having abnormally folded proteins. Prions induce other healthy proteins to fold incorrectly, leaving patches of useless debris and holes that turn brains to sponge, resulting in death. The disease has an incubation period in cattle of up to eight years.

Question20

Which of the following statements is correct? (OD NEET 2019)

Options:

A. Lichens are not good pollution indicators.

B. Lichens do not grow in polluted areas.

C. Algal component of lichens is called mycobiont.

D. Fungal component of lichens is called phycobiont.

Answer: B

Solution:

(b) Lichen is a symbiosis between different organisms. It is composed of a fungal partner (mycobiont) and one or more photosynthetic partners (photobiont). The photosynthetic partner is generally green algae or cyanobacteria.
Lichens are well known as sensitive indicators of air pollution, particularly for sulphur dioxide. If air is very badly polluted with sulphur dioxide there may be no lichens present, just green algae may be found. If the air is clean, shrubby, hairy and leafy lichens become abundant.

Question21

Which one is the wrong pairing for the disease and its causal organism? (2019)

Options:

A. Black rust of wheat-*Puccinia graminis*

B. Loose smut of wheat-*Ustilago nuda*

C. Root knot of vegetables-*Meloidogyne* sp.

D. Late blight of potato-*Alternaria solani*

Answer: D

Solution:

(d) : Late blight of potato disease is caused by *Phytophthora infestans.* It is a phycomycetes fungus. *Alternaria solani* is the causal organism of early blight of potato disease.

Question22

Which among the following is not a prokaryote?

(2018)

Options:

A. Saccharomyces

B. Mycobacterium

C. Oscillatoria

D. Nostoc

Answer: A

Solution:

Solution:
(a) Saccharomyces i.e. yeast is an eukaryote (unicellular fungi). Mycobacterium is a bacterium. Oscillatoria and Nostoc are cyanobacteria.

Question23

Which of the following organisms are known as chief producers in the oceans?
(2018)

Options:

A. Dinoflagellates

B. Diatoms

C. Euglenoids

D. Cyanobacteria

Answer: B

Solution:

Solution:
(b) Diatoms are the chief producers in some oceans and in some seasons as they are the primary producers and the food chain in marine ecosystem depends on it.

Question24

Ciliates differ from all other protozoans in
(2018)

Options:

A. using flagella for locomotion

B. having a contractile vacuole for removingexcess water

C. having two types of nuclei

D. using pseudopodia for capturing prey

Answer: C

Solution:

Solution:
(c) Ciliates differs from other protozoans in having two types of nuclei. E.g., Paramoecium have two types of nuclei i.e. macronucleus & micronucleus.

Question25

Which of the following are found in extreme saline conditions? (NEET 2017)

Options:

A. Eubacteria

B. Cyanobacteria

C. Mycobacteria

D. Archaebacteria

Answer: D

Solution:

Solution:
(d) : Halophiles, a type of archaebacteria, usually occur in extreme saline conditions like salt pans, salt beds and salt marshes.

Question26

Viroids differ from viruses in having (NEET 2017)

Options:

A. DNA molecules without protein coat

B. RNA molecules with protein coat

C. RNA molecules without protein coat

D. DNA molecules with protein coat.

Answer: C

Solution:

(c) : Viroids are free RNA particles that lack protein coat. They are infectious agents smaller than viruses.

Question27

Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen?
(NEET 2017)

Options:

A. Pseudomonas

B. Mycoplasma

C. Nostoc

D. Bacillus

Answer: B

Solution:

Solution:
(b) : Mycoplasmas are the smallest living cells, known without a definite cell wall. They are pathogenic to both plants and animals and can survive without oxygen.

Question28

Which of the following components provides sticky character to the bacterial cell?
(NEET 2017)

Options:

A. Nuclear membrane

B. Plasma membrane

C. Glycocalyx

D. Cell wall

Answer: C

Solution:

Solution:
Glycocalyx is the outermost mucilage layer of the cell envelope which consists of non-cellulosic polysaccharides with or without proteins. It gives sticky character to the cell.

Question29

DNA replication in bacteria occurs (NEET 2017)

Options:

A. within nucleolus

B. prior to fission

C. just before transcription

D. during S phase.

Answer: B

Solution:

Solution:
(b) : DNA replicates in bacteria just before they divide by fission.

Question30

Which one of the following is wrong for fungi? (NEET-II 2016)

Options:

A. They are eukaryotic.

B. All fungi possess a purely cellulosic cell wall.

C. They are heterotrophic.

D. They are both unicellular and multicellular.

Answer: B

Solution:

(b) : Cell wall in fungi is composed of chitin, a polysaccharide comprising N-acetyl-Dglucosamine (a derivative of glucose).

Question31

Methanogens belong to
(NEET 2016)

Options:

A. eubacteria

B. archaebacteria

C. dinoflagellates

D. slime moulds.

Answer: B

Solution:

Solution:
(b) : Methanogens belong to archaebacteria. They include methane producing genera such as *Methanobacillus* and *Methanothrix*. Methanogens are obligate anaerobes found in oxygen-deficient environments, such as marshes, swamps, sludge (formed during sewage treatment), and the digestive systems of ruminants. Mostly they obtain their energy by reducing carbon dioxide and oxidising hydrogen, with the production of methane.

Question32

Select the wrong statement.
(NEET-II 2016)

Options:

A. The walls of diatoms are easily destructible.

B. 'Diatomaceous earth' is formed by the cell walls of diatoms.

C. Diatoms are chief producers in the oceans.

D. Diatoms are microscopic and float passively in water.

Answer: A

Solution:

(a): Diatoms are marine or freshwater unicellular organisms which have cell walls (frustules) composed of pectin impregnated with silica and consisting of two halves, one overlapping the other. The siliceous frustules of diatoms do notdecay easily.

Question33

The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals, include the (NEET-I 2016)

Options:

A. methanogens

B. eubacteria

C. halophiles

D. thermoacidophiles.

Answer: A

Solution:

Solution:
Methanogens belong to archaebacteria. They include methane producing genera such as *Methanobacillus* and *Methanothrix.* Methanogens are obligate anaerobes found in oxygen-deficient environments, such as marshes, swamps, sludge (formed during sewage treatment), and the digestive systems of ruminants. Mostly they obtain their energy by reducing carbon dioxide and oxidising hydrogen, with the production of methane.

Question34

Which one of the following statements is wrong? (NEET-I 2016)

Options:

A. Eubacteria are also called false bacteria.

B. Phycomycetes are also called algal fungi.

C. Cyanobacteria are also called blue-green algae.

D. Golden algae are also called desmids.

Answer: A

Solution:

Eubacteria are also called true bacteria.

Question35

Which of the following statements is wrong for viroids? (NEET-I 2016)

Options:

A. They cause infections.

B. Their RNA is of high molecular weight.

C. They lack a protein coat.

D. They are smaller than viruses.

Answer: B

Solution:

Solution:
(b) : RNA of viroid has low molecular weight.

Question36

One of the major components of cell wall of most fungi is (NEET-I 2016)

Options:

A. cellulose

B. hemicellulose

C. chitin

D. peptidoglycan.

Answer: C

Solution:

Solution:
(c) : Fungal cell wall contains chitin or fungal cellulose along with other polysaccharides, proteins, lipids and a number of other substances.

Question37

Chrysophytes, Euglenoids, Dinoflagellates and Slime moulds are included in the Kingdom
(NEET-I 2016)

Options:

A. Fungi

B. Animalia

C. Monera

D. Protista.

Answer: D

Solution:

Solution:
(d) : Protista is a kingdom of unicellular eukaryotic organisms. It includes photosynthetic protists (dinoflagellates, chrysophytes and euglenoids), consumer-decomposer protists (slime moulds) and protozoan protists.

Question38

Which one is a wrong statement?
(2015)

Options:

A. Haploid endosperm is typical feature of Gymnosperms.

B. Brown algae have chlorophyll a and c and fucoxanthin.

C. Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms.

D. Mucor has biflagellate zoospores.

Answer: D

Solution:

Solution:
(d) : *Mucor* is a member of Zygomycetes (the conjugation fungi) in which motile cells e.g. zoospores, planogametes, etc. are absent. Asexual reproduction takes place by the formation of nonmotile mitospores called sporangiospores. Sexual reproduction takes place by the formation of nonmotile zygospores.

Question39

The imperfect fungi which are decomposers of litter and help in mineral

cycling belong to
(2015)

Options:

A. Phycomycetes

B. Ascomycetes

C. Deuteromycetes

D. Basidiomycetes.

Answer: C

Solution:

Solution:
(c) : Deuteromycetes are the imperfect fungi which include all those fungi in which sexual stage is either absent or not known. Some members aresaprophytes or parasites while a large number of them are decomposers of litter and help in mineral cycling. E.g., *Colletotrichum, Helminthosporium* etc.

Question40

The structures that help some bacteria to attach to rocks and/or host tissues are
(2015)

Options:

A. mesosomes

B. holdfast

C. rhizoids

D. fimbriae

Answer: D

Solution:

Solution:
16. (d) : Fimbriae are small bristle-like solid structures arising from bacterial cell surface. There are 300 - 400 of fimbriae per cell. Their diameter is 3 - 10 nm while length is 0.5-1.5 mm. Fimbriae are involved in attaching bacteria to solid surfaces (e.g., rock in water body) or host tissues (e.g., urinary tract in Neisseria gonorrhoeae). Some fimbriae cause agglutination of RBCs. They also help in mutual clinging of bacteria.

Question41

Select the wrong statement.
(2015)

Options:

A. The term 'contagium vivum fluidum' was coined by M. W. Beijerinck.

B. Mosaic disease in tobacco and AIDS in human being are caused by viruses.

C. The viroids were discovered by D.J. Ivanowsky.

D. W.M. Stanley showed that viruses could be crystallised.

Answer: C

Solution:

Solution:
(c) : Viroids are infectious RNA particles which were discovered by T.O. Diener (1971) . These are devoid of protein coat and cause diseases in plants only, e.g., potato spindle tuber, chrysanthemum stunt etc.

Question42

In which group of organisms the cell walls form two thin overlapping shells which fit together?
(2015)

Options:

A. Dinoflagellates

B. Slime moulds

C. Chrysophytes

D. Euglenoids

Answer: C

Solution:

Solution:
(c) : Chrysophytes include diatoms and desmids. The body of diatoms is covered by a transparent siliceous shell (silica deposited in cell wall) known as frustule. The frustule is made of two valves, epitheca and hypotheca, which fit together like a soap box.

Question43

Pick up the wrong statement.

(2015)

Options:

A. Some fungi are edible.

B. Nuclear membrane is present in Monera.

C. Cell wall is absent in Animalia.

D. Protists have photosynthetic and heterotrophic modes of nutrition.

Answer: B

Solution:

Solution:
(b) : Kingdom Monera consists of prokaryotic organisms, characterised by absence of nuclear envelope around nucleus and absence of membrane-bound cell organelles.

Question44

Choose the wrong statement.
(2015)

Options:

A. Morels and truffles are poisonous mushrooms.

B. Yeast is unicellular and useful in fermentation.

C. Penicillium is multicellular and produces antibiotics.

D. Neurospora is used in the study of biochemical genetics.

Answer: A

Solution:

Solution:
(a) : Morels are Ascomycetes with edible ascocarps that have fleshy sponge-like conical cap or pileus and a stalk like stipe, e.g., Morchella esculenta. Truffles are also edible members of Ascomycetes with tuber-like subterranean ascocarps that are often dug out with the help of trained dogs and pigs, e.g., Tuber aestivum.

Question45

Cell wall is absent in
(2015)

Options:

A. Mycoplasma

B. Nostoc

C. Aspergillus

D. Funaria

Answer: A

Solution:

Solution:
(a) : Mycoplasma (Kingdom-Monera) are the simplest and smallest free living prokaryotes which are devoid of a cell wall. Plasma membrane forms the outer boundary of the cell of mycoplasma. Nostoc is a cyanobacterium (Kingdom- Monera), in which cell wall comprises of peptidoglycans. Aspergillus is a fungus (Kingdom-Fungi) in which cell wall is mainly made of chitin. Funaria is a bryophyte (Kingdom-Plantae) in which cell wall is cellulosic in nature.

Question46

True nucleus is absent in (2015 Cancelled)

Options:

A. Vaucheria

B. Volvox

C. Anabaena

D. Mucor

Answer: C

Solution:

Solution:
(c) : Anabaena is a prokaryotic organism. It is a cyanobacteria (blue green algae) which belongs to Kingdom Monera. Like all other prokaryotes, it lacks a true nucleus and other cell organelles.

Question47

Which one of the following matches is correct?

(a) Mucor	Reproduction by Conjugation	Ascomycetes
(b) Agaricus	Parasitic fungus	Basidiomycetes
(c) Phytophthora	Aseptate mycelium	Basidiomycetes
(d)Alternaria	Sexual reproduction absent	Deuteromycetes

(2015 Cancelled)

Options:

A. a

B. b

C. c

D. d

Answer: D

Solution:

Solution:
Option A : Phytophthora belongs to algal fungi, also known as phycomycetes. These are mostly found in aquatic habitats. They have coenocytic and septate mycelium. Therefore, this is the incorrect option.
Option B : Agaricus, which is also known as mushroom, belongs to basidiomycetes. They grow on soil, logs and tree stumps. Asexual spores are absent, but vegetative reproduction is common in them.These are saprophytic fungi and are not parasitic. Ustillago and Puccinia are other examples for basidiomycetes. Therefore, this is the incorrect option.
Option C : Mucor is a type of fungus seen in soil and plant leaves. They belongs to the category of phycomycetes and they undergoes asexual reproduction by zoospores or aplanospores. Other examples for phycomycetes are Rhizopus and Albugo. Therefore, this is the incorrect option.
Option D : Alternaria belongs to deuteromycetes, which are also known as imperfect fungi, since they reproduce through asexual reproduction or vegetative reproduction. Deuteromycetes reproduces by asexual spores known as conidia. Some members of deuteromycete are parasitic and saprophytes, while a majority of them are decomposers of litter and they help in mineral cycling. Alternaria lack sexual reproduction. Therefore, this is the correct option.

Question48

Five kingdom system of classification suggested by R.H. Whittaker is not based on
(2014)

Options:

A. presence or absence of a well defined nucleus

B. mode of reproduction

C. mode of nutrition

D. complexity of body organisation

Answer: B

Solution:

RH Whittaker's 5 kingdom classification is based on
1. Presence or absence of nuclear membrane (Monera + Eukaryotes)
2. Complexity of organisation (Protista + Multicellular Eukaryotes)
3. Mode of nutrition and Presence of Cell Wall (Animalia + Fungi + Plantae)

Question49

Which of the following shows coiled RNA strand and capsomeres? (2014)

Options:

A. Polio virus

B. Tobacco mosaic virus

C. Measles virus

D. Retrovirus

Answer: B

Solution:

Solution:
(b) : Tobacco mosaic virus is a RNA virus that causes tobacco mosaic disease. It has single stranded coiled RNA molecule as its genetic material a part of which hangs outside the protein coat. Protein coat consists of approximately 2130 capsomeres which are helically arranged to form a hollow cylinder of about 4 nm diameter.

Question50

Viruses have (2014)

Options:

A. DNA enclosed in a protein coat

B. prokaryotic nucleus

C. single chromosome

D. both DNA and RNA

Answer: A

Solution:

Solution:
(a) : Viruses are nucleoprotein entities which are able to utilize synthetic machinery of a living cell of the host organism

for its multiplication which does not involve growth and division. They have either RNA or DNA as genetic material and a protein coat.

Question51

Archaebacteria differ from eubacteria in (2014)

Options:

A. cell membrane structure

B. mode of nutrition

C. cell shape

D. mode of reproduction

Answer: A

Solution:

Solution:
(a) : The archaebacteria are the 'ancient' bacteria that include extremophiles like methanogens, halophiles and thermophiles. They represent some of the most ancient of life forms that persist today. They have both eubacterial and eukaryotic characters besides the features unique to them. Their mode of reproduction, nutrition and cell shape and size resembles a typical eubacteria. Their cell walls are made of a variety of polymers, but do not contain peptidoglycan unlike eubacteria. Lipids of their cytoplasmic membranes are ether linked unlike eubacteria which contain glycerol ester lipids in their cell membrane.

Question52

Which structures perform the function of mitochondria in bacteria? (2014)

Options:

A. Nucleoid

B. Ribosomes

C. Cell wall

D. Mesosomes

Answer: D

Solution:

(d) : Mesosome is a characteristic circular to villiform specialisation of bacterial cell membrane that develops as an

ingrowth. It consists of vesicles, tubules and lamellae. Mesosomes may be septal or lateral. Septal mesosome connects nucleoid with plasma membrane and assists in replication and septum formation during cells division. Lateral mesosome is not connected with nucleoid and contains respiratory enzymes and performs functions similar to eukarytoic mitochondria and hence is also called chondrioid. They also increase the surface area of plasma membrane and enzymatic contact.

Question53

The motile bacteria are able to move by (2014)

Options:

A. fimbriae

B. flagella

C. cilia

D. pili

Answer: B

Solution:

Solution:
(b) : Flagellum is the organ of motility in bacteria. Bacterial flagella are unistranded, equivalent to a single microtubular fibre and formed of protein called flagellin. They perform rotatory movements.

Question54

Anoxygenic photosynthesis is characteristic of (2014)

Options:

A. Rhodospirillum

B. Spirogyra

C. Chlamydomonas

D. Ulva

Answer: A

Solution:

(a): In Rhodospirillum, electron donor is organic compound instead of water hence no oxygen is released, i.e., an

oxygenic photosynthesis occurs. In other plants water is used as electron donor and H^+ and O_2 are produced during photolysis of water.

Question55

Which of the following are likely to be present in deep sea water? (NEET 2013)

Options:

A. Blue-green algae

B. Saprophytic fungi

C. Archaebacteria

D. Eubacteria

Answer: C

Solution:

Solution:
(c): Archaebacteria belong to a group of prokaryotic organisms called Monera. These include the methanogens, which produce methane; the thermoacidophilic bacteria, which live in extremely hot and acidic environments (such as hot springs); and the halophilic bacteria, which can only function at high salt concentrations and are abundant in the world's oceans.

Question56

Pigment containing membranous extensions in some cyanobacteria are (NEET 2013)

Options:

A. pneumatophores

B. chromatophores

C. heterocysts

D. basal bodies.

Answer: B

Solution:

(b) : Chromatophore is a pigmented lamellar or vesicular structure that can be isolated from disrupted photosynthetic bacteria or cyanobacteria. Their plasma membrane may be projected in folds into the cytoplasm forming lamellae that

have, therefore, double unit-membrane structure. The pigments and most of the enzymes required for the light-induced electron transport and phosphorylation processes of photosynthesis, are located in the plasma membrane and lamellae.

Question57

Why is a capsule advantageous to a bacterium? (KN NEET 2013)

Options:

A. It protects the bacterium from desiccation.

B. It provides means of locomotion.

C. It allows bacterium to "hide" from host's immune system.

D. It allows the bacterium to attach to the surface.

Answer: A

Solution:

Solution:
Bacterial capsule usually consists of a polysaccharide layer that lies outside the cell envelope. The capsule is found in both gram-positive and gram-negative bacterium.The capsule is considered as virulence factor because it enhances the ability of bacteria to cause disease. It protects the bacterial cell from engulfment by macrophages.Capsules also contain water which protects the bacterium from desiccation.

Question58

Which one of the following is true for fungi? (KN NEET 2013)

Options:

A. They lack a rigid cell wall.

B. They are heterotrophs.

C. They lack nuclear membrane.

D. They are phagotrophs.

Answer: B

Solution:

(b) : Fungi are achlorophyllous, heterotrophic, spore forming, non-vascular, eukaryotic organisms which often contain chitin or fungal cellulose in their walls. Hence, their cell wall is rigid.

Question59

Which statement is wrong for viruses? (2012)

Options:

A. All are parasites.

B. All of them have helical symmetry.

C. They have ability to synthesize nucleic acids and proteins.

D. Antibiotics have no effect on them.

Answer: B

Solution:

Solution:
(b) : In viruses, three architectural forms are found - helical (elongated body, e.g., TMV), cuboidal (short broad body with rhombic, rounded, polyhedral shape e.g., poliovirus) and binal (with both cuboidal and helical parts e.g., T_2 phage).

Question60

Maximum nutritional diversity is found in the group (2012)

Options:

A. fungi

B. animalia

C. monera

D. plantae

Answer: C

Solution:

Solution:
(c) : Though the bacterial structure is very simple, they are very complex in behaviour. Compared to many other organisms, bacteria as a group show the most extensive metabolic diversity. Some of the bacteria are autotrophic, i.e., they synthesize their own food from inorganic substrates. They may be photosynthetic autotrophic or chemosynthetic autotrophic. The vast majority of bacteria are heterotrophs, i.e., they do not synthesize their own food but depend on other organisms or on dead organic matter for food.

Question61

Nuclear membrane is absent in (2012)

Options:

A. Penicillium

B. Agaricus

C. Volvox

D. Nostoc.

Answer: D

Solution:

Solution:
(d) : Penicillium and Agaricus are fungi while Volvox is an alga. All three are eukaryotes thus have a membrane bound nucleus. Nostoc is acyanobacterium, i.e., prokaryote, so it lacks true nucleus, thus nuclear membrane is absent.

Question62

The cyanobacteria are also referred to as (2012)

Options:

A. protists

B. golden algae

C. slime moulds

D. blue green algae.

Answer: D

Solution:

Solution:
(d) : Cyanobacteria is a phylum consisting of two groups of photosynthetic eubacteria: the blue-green bacteria (formerly known as blue-green algae, or cyanophyta), which comprise the vast majority of members, and the grass-green bacteria, or chloroxybacteria.

Question63

The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are the ones categorised as (2012)

Options:

A. cyanobacteria

B. archaebacteria

C. chemosynthetic autotrophs

D. heterotrophic bacteria.

Answer: D

Solution:

Solution:
(d) : Maximum number of antibiotics are produced by mycelial bacteria known as actinomycetes and most of the actinomycetes are saprotrophic (heterotrophic). Lactic acid bacteria that are used in preparation of curd are also heterotrophic ones.

Question64

**Which one single organism or the pair of organisms is correctly assigned to its or their named taxonomic group?
(2012)**

Options:

A. Paramecium and Plasmodium belong to the same kingdom as that of Penicillium.

B. Lichen is a composite organism formed from the symbiotic association of an algae and a protozoan.

C. Yeast used in making bread and beer is a fungus.

D. Nostoc and Anabaena are examples of protista.

Answer: C

Solution:

Solution:
(c) : Yeast is a group of unicellular fungi of the class ascomycetes. They occur as single cell or as a group or chain of cells. Yeast of the genus Saccharomyces ferments sugar and are used to make bread and beer.

Question65

Which one of the following microbes forms symbiotic association with plants and helps them in their nutrition?
(2012)

Options:

A. Azotobacter

B. Aspergillus

C. Glomus

D. Trichoderma

Answer: C

Solution:

Solution:
(c) : Azotobacter, Aspergillus and Trichoderma all are free living microbes that help plants in their nutrition. Glomus is a fungus that symbiotically forms endomycorrhiza that helps in absorption of nutrition specially phosphorus from soil.

Question66

In the five kingdom classification, Chlamydomonas and Chlorella have been included in
(Mains 2012)

Options:

A. protista

B. algae

C. plantae

D. monera.

Answer: A

Solution:

Solution:
42. (a): In order to develop phylogenetic classification, R.H. Whittaker (1969), an American taxonomist, divided all the organisms into five kingdoms. Whittaker has used five criteria for delimiting the different kingdoms.
(i) Complexity of cell structure, prokaryotic and eukaryotic.
(ii) Complexity of body structure or structural organization, unicellular and multicellular.
(iii) Mode of nutrition which is divergent in multicellular kingdoms.
(iv) Ecological life style like producers (plantae), decomposers (fungi) and consumers (animalia),
(v) Phylogenetic relationship. When such characteristics were considered, the fungi were placed in a separate kingdom - Kingdom Fungi. All prokaryotic organisms were grouped together under Kingdom Monera and the unicellular eukaryotic organisms were placed in Kingdom Protista. Kingdom Protista has brought together Chlamydomonas, Chlorella (earlier placed in Algae within Plants and both having cell walls) with Paramoecium and Amoeba (which were earlier placed in the animal kingdom which lack cell wall). It has put together organisms which, in earlier classifications, were placed in

different kingdoms. This happened because the criteria for classification changed.

Question67

Which one of the following also acts as a catalyst in a bacterial cell? (2011)

Options:

A. 5S rRNA

B. snRNA

C. hnRNA

D. 23S rRNA

Answer: D

Solution:

Solution:
(d): The 23S rRNA is a component of the large prokaryotic (bacterial cell) subunit (50S). The ribosomal peptidyl transferase activity resides in this rRNA and acts as a ribozyme (catalytic RNA). In eukaryotic cells, the 60s (28S component) ribosome subunit contains the peptidyl transferase component and acts as the ribozyme.

Question68

In eubacteria, a cellular component that resembles eukaryotic cell is (2011)

Options:

A. plasma membrane

B. nucleus

C. ribosomes

D. cell wall.

Answer: A

Solution:

Solution:
(a) : Plasma membrane of eubacteria resembles plasma membrane of eukaryotic cell. But nucleus, ribosomes and cell wall are little different in eukaryotic cell in their structure and organization from eubacterial cell.

Question69

Which one of the following organisms is not an eukaryote? (2011)

Options:

A. *Paramecium caudatum*

B. *Escherichia coli*

C. *Euglena viridis*

D. *Amoeba proteus*

Answer: B

Solution:

Solution:
(b) : Escherichia coli (bacterium) is not an example of eukaryotic cell. It is a typical example of prokaryotic cell.

Question70

Which one of the following is incorrectly matched? (2011)

Options:

A. Root pressure-guttation

B. *Puccinia*-smut

C. Root-exarch protoxylem

D. Cassia-imbricate aestivation 11

Answer: B

Solution:

Solution:
(b) : Rust is a group of parasitic fungi of the phylum Basidiomycota. Many of these species attack the leaves and stems of cereal crops. Pathogens of rust are *Puccinia*, *Uromyces*, *Melampsora*, *Hemileia.*

Question71

The pathogen Microsporum responsible for ringworm disease in

humans belongs to the same kingdom of organisms as that of
(Mains 2011)

Options:

A. *Taenia,* a tapeworm

B. *Wuchereria,* a filarial worm

C. *Rhizopus,* a mould

D. *Ascaris,* a round worm.

Answer: C

Solution:

Solution:
(c) : The pathogen Microsporum is genus of Kingdom Fungi that causes diseases of skin and hair in humans and animals like dog, cat, monkey. Ringworm is caused by the dermatophyte fungi species of *Microsporum, Trichophyton* and *Epidermophyton.Rhizopus*, a black bread mould belongs to group zygomycetes of Kingdom Fungi.

Question72

Virus envelope is known as
(2010)

Options:

A. capsid

B. virion

C. nucleoprotein

D. core.

Answer: A

Solution:

(a): The nucleic acid of a virus is surrounded by a protein coat called the capsid. The capsid is composed of protein subunits called capsomeres. In some viruses, the capsid is covered by an envelope, which usually consists of some combination of lipids, proteins and carbohydrates.

Question73

single-celled eukaryotes are included in
(2010)

Options:

A. protista

B. fungi

C. archaea

D. monera.

Answer: A

Solution:

Solution:
49. (a) : Protista include all unicellular and colonial eukaryotes except those of green and red algae. The protistan cells are typically eukaryotic having membrane bound organelles like mitochondria, chloroplasts, Golgi bodies, endoplasmic reticulum, nucleus etc. Protista is commonly known as kingdom of unicellular eukaryotes. Kingdom fungi contains achlorophyllous, spore producing, heterotrophic, multicellular or multinucleate eukaryotic organisms (unicellular yeasts are also included amongst fungi because their sexual reproduction is similar to that of some fungi). Monerans are basically unicellular prokaryotes. Archaea (ancient bacteria) are also a type of monerans which live in primitive environment like high temperature, high salt content, acidic pH, etc.

Question74

Some hyperthermophilic organisms that grow in highly acidic pH 2 habitats belong to the two groups
(2010)

Options:

A. eubacteria and archaea

B. cyanobacteria and diatoms

C. protists and mosses

D. liverworts and yeasts.

Answer: A

Solution:

Solution:
(a) : There are two major groups of monerans archaebacteria (ancient bacteria) and eubacteria (true bacteria). Eubacteria is of further two types - bacteria and cyanobacteria. Thermoacidophiles are a type of archaebacteria which live in extremely acidic environment (pH 2) that have extremely high temperatures (upto 110° C). They are found in hot sulphur springs. Some of the eubacteria are also famous for living under the most hostile environment like salt pans, petroleum pans, spilled oil, hot springs, sulphur springs, snow, etc.

Question75

One of the free-living, anaerobic nitrogenfixer is (2010)

Options:

A. Beijernickia

B. Rhodospirillum

C. Rhizobium

D. Azotobacter

Answer: B

Solution:

Solution:
(b) : Many free living bacteria and blue green algae are capable to fix atmospheric nitrogen Rhodospirillum is a free living photosynthetic anaerobic nitrogen fixing non-sulphur bacteria. It is capable of synthesizing its organic food in presence of light and in absence of O_2 by a process known as bacterial photosynthesis. *Beijernickia* and *Azotobacter* are free living but aerobic nitrogen fixing bacteria. *Rhizobium* is a symbiotic nitrogen fixing bacteria.

Question76

Membrane-bound organelles are absent in (2010)

Options:

A. Saccharomyces

B. Streptococcus

C. Chlamydomonas

D. Plasmodium.

Answer: B

Solution:

Solution:
(b) : *Streptococcus* is a bacteria which is included under Kingdom Monera. Monerans have prokaryotic cell organisation in which membrane bound organelles like mitochondria, E.R., Golgin bodies, etc. are absent. All the other three i.e.., *Saccharomyces* (a fungus) *Chlamydomonas* (an algae) and *Plasmodium* (a protozoan protist) are eukaryotes containing true membrane bound organelles

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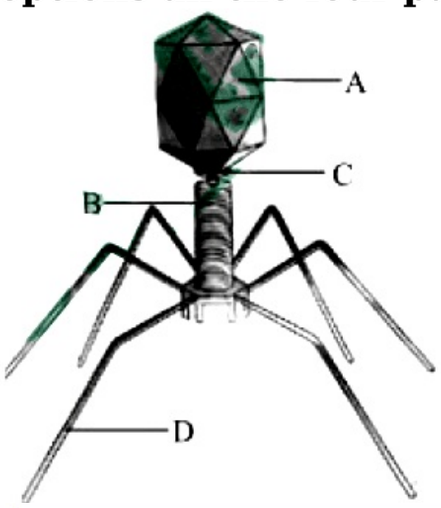
Question77

Give below is the diagram of a bacteriophage. In which one of the options all the four parts A,B,C and D are correct?



	A	B	C	D
(a)	Tail fibres	Head	Sheath	Collar
(b)	Sheath	Collar	Head	Tail fibres
(c)	Head	Sheath	Collar	Tail fibres
(d)	Collar	Tail fibres	Head	Sheath

(Mains 2010)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: C

Solution:

Solution:
A - Head
B - Sheath
C - Collar
D - Tail fiber

Question78

Select the correct combination of the statements (i-iv) regarding the characteristics of certain organisms.
(i) Methanogens are archaebacteria which produce methane in marshy areas.

(ii) *Nostoc* is a filamentous blue-green alga which fixes atmospheric nitrogen.
(iii) Chemosynthetic autotrophic bacteria synthesize cellulose from glucose.
(iv) Mycoplasma lack a cell wall and can survive without oxygen. The correct statements are
(Mains 2010)

Options:

A. (ii) and (iii)

B. (i),(ii) and (iii)

C. (ii), (iii) and (iv)

D. (i), (ii) and (iv)

Answer: D

Solution:

Solution:
(d) : Chemosynthetic autotrophic bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for their ATP production. They play a great role in recycling nutrients like nitrogen, phosphorous, iron and sulphur.

Question79

Black (stem) rust of wheat is caused by
(Mains 2010)

Options:

A. *Alternaria solani*

B. *Ustilago nuda*

C. *Puccinia graminis*

D. *Xanthomonas oryzae*

Answer: C

Solution:

Solution:
(c) : Black stem rust is caused by *Puccinia graminis tritici.* The genus *Puccinia* includes 700 species, which cause rust diseases of many economic plants such as wheat, barley, oats, etc. It is called a rust because of the reddish brown color of the spores that are found chiefly upon the surface of the host leaves and stems. *P. graminis* is heteroecious i.e., requiring two hosts, wheat and barberry for the completion of normal life cycle. According to the nature of the spores, the life cycle of the *P. graminis* is divided into five stages. It is during, teleuto stage, the teliospore (or teleutospores) produce

dark brown to black pustules on the surface of stems and leaves of the wheat that results into 'black stem rust of wheat'.

Question80

Phylogenetic system of classification is based on (2009)

Options:

A. morphological features

B. chemical constituents

C. floral characters

D. evolutionary relationships.

Answer: D

Solution:

Solution:
(d) : Plylogenetic system or cladistics is based on evolutionary sequence as well as the genetic relationship among the living beings. Engler and Prantl's System of Classification was jointly proposed in Die Naturlichen Pflanzen Familien in 1892 . It is the first phylogenetic system of classification which includes all the plants from algae to angiosperms arranged in an evolutionary sequence from simplicity to complexity.

Question81

T.O. Diener discovered a (2009)

Options:

A. free infectious DNA

B. infectious protein

C. bacteriophage

D. free infectious RNA.

Answer: D

Solution:

Solution:
Viroids are infectious RNA particles which were discovered by T.O. Diener (1971) . These are devoid of protein coat and cause diseases in plants only, e.g., potato spindle tuber, chrysanthemum stunt etc.

Question82

Oxygenic photosynthesis occurs in (2009)

Options:

A. *Oscillatoria*

B. *Rhodospirillum*

C. *Chlorobium*

D. *Chromatium.*

Answer: A

Solution:

Solution:
(a) : Oscillatoria is a filamentous Gram-ve cyanobacteria which perform oxygenic photosynthesis because of the presence of chlorophyll-a like eukaryotic algae and higher plants.

Question83

Which of the following is a symbiotic nitrogen fixer? (2009)

Options:

A. *Azotobacter*

B. *Frankia*

C. *Azolla*

D. *Glomus*

Answer: B

Solution:

Solution:
(b) : Frankia, is a nitrogen fixing symbiotic bacteria. It induces root nodules just like Rhizobium. It is associated symbiotically with the root nodules of several non-legume plants like Casuarina, Alnus, Rubus etc. It cannot fix nitrogen in free state.

Question84

Bacterial leaf blight of rice is caused by a species (2008)

Options:

A. *Alternaria*

B. *Erwinia*

C. *Xanthomonas*

D. *Pseudomonas.*

Answer: C

Solution:

Solution:
(c) : Bacterial leaf blight of rice is caused by *Xanthomonas oryzae* a bacterium which is gramnegative, aerobic, capsulated, and motile with a single polar flagellum. Primary infection is carried through the infected seeds. The entry of the pathogen occurs through wounds and stomata. The symptoms of the disease is the appearance of linear, yellow to straw coloured stripes, usually on both the edges of the leaf. As the disease progresses, the drying and twisting of the leaf tip occurs. The most destructive phase of the disease is the 'Ikresek' or wilt resulting from early systematic infection.

Question85

Thermococcus, Methanococcus and *Methanobacterium* exemplify (2008)

Options:

A. bacteria whose DNA is relaxed or positively supercoiled but which have a cytoskeleton as well as mitochondria

B. bacteria that contain a cytoskeleton and ribosomes

C. archaebacteria that contain protein homologous to eukaryotic core histones

D. archaebacteria that lack any histones resembling those found in eukaryotes but whose DNA is negatively supercoiled.

Answer: C

Solution:

Solution:
(c) : *Thermococcus, Methanococcus* and *Methanobacterium* are examples of archaebacteria which are characterized by a unique cell wall that lack peptidoglycan and consist of polysaccharides and protein and closely resemble the eukaryotic cell in the mechanism of protein synthesis, structural protein and RNA compliments of the ribosomes.

Question86

In the light of recent classification of living organisms into three domains of life (bacteria, archaea and eukarya), which one of the following statements in true about archaea?
(2008)

Options:

A. Archaea completely differ from both prokaryotes and eukaryotes.

B. Archaea completely differ from prokaryotes.

C. Archaea resemble eukarya in all respects.

D. Archaea have some novel features that are absent in other prokaryotes and eukaryotes.

Answer: D

Solution:

Solution:
(d) : Archaebacteria represent a cell type that seems to possess the characteristics of both prokaryotes as well as eukaryotes. In size, the archaebacteria are about 1µm in diameter, the size of typical prokaryotes lack membrane-bound organelles, nuclear bodies are not bound by nuclear membranes as it is in eukaryotes and ribosomes are 70 S, the size of those found in typical prokaryotes. They have unique cell wall that lacks peptidoglycan, closely resemble the eukaryotic cells in the mechanisms of protein synthesis, structural proteins, and RNA compliments of the ribosomes and a very distinctive feature of archaebacterial genes is the presence of introns, elements that are totally unknown in other prokaryotes, though relatively common in eukaryotes.Archaebacteria also possess unique characteristic found in neither eukaryotes nor prokaryotes. For example, their membrane contain branched chain lipids with ether. This enables them to tolerate extremes of heat and pH

Question87

Which one of the following is a slime mould?
(2007)

Options:

A. *Physarum*

B. *Thiobacillus*

C. *Anabaena*

D. *Rhizopus*

Answer: A

Solution:

(a): Slime moulds are peculiar protista that normally take the form of amoebae, but under certain conditions develop fruiting bodies that release spores, superficially similar to the sporangia of fungi. The order physarales include Physarum species. The fruiting bodies (sporangia) are characterized by the presence of abundant amount of calcium salt. The order comprises 142 species which are placed under 12 genera. Physarum polycephalam is the best known. The somatic phase is multinucleate, diploid holocarpic plasmodium which is the product of syngamy.

Question88

Which one of the following statements about mycoplasma is wrong? (2007)

Options:

A. They are pleomorphic.

B. They are sensitive to penicillin.

C. They cause diseases in plants.

D. They are also called PPLO.

Answer: B

Solution:

Solution:
(b) : Mycoplasma are small, unicellular, (nonmotile) prokaryotic organisms. They are pleomorphic. Therefore they are known as pleuro pneumonia like organisms (PPLO). They lack cell wall. It contains cytoplasm, ribosomes and DNA. They are inhibited by tetracyclines but insensitive to penicillin. They cause various diseases.

Question89

Which pair of the following belongs to basidiomycetes? (2007)

Options:

A. Puffballs and *Claviceps*

B. *Peziza* and stink horns

C. *Morchella* and mushrooms

D. Birds nest fungi and puffballs

Answer: D

Solution:

(d) : The Cyathus is known as bird's nest fungi, and Lycoperdon is called puff balls. Both thesefungi belong to the group

of club fungi or basidiomycetes. These fungi produce spores inside club shaped fruit bodies called basidium. Typically basidium has 4 basidiospores produced exogenously. *Peziza* and *Morchella, Claviceps* belong to ascomycetes (produce ascospores in ascocarps). Mushroom are basidiomycetes fungi.

Question90

Curing of tea leaves is brought about by the activity of (2006)

Options:

A. fungi

B. bacteria

C. mycorrhiza

D. viruses.

Answer: B

Solution:

Solution:
(b) : Curing is a process done to add special flavour and taste in tea leaves. It is also done for tobacco. In this process after harvesting the cured leaves are hung in shade and are permitted for the action of bacteria. The curing of tea leaves is done by *Mycrococcus candidans. Mycrococcus* is a gram positive aerobic bacterium which is a member of micrococcaceae.

Question91

Which of the following environmental conditions are essential for optimum growth of Mucor on a piece of bread?
A. Temperature of about 25˚C
B. Temperature of about 5˚C
C. Relative humidity of about 5%
D. Relative humidity of about 95%
E. A shady place
F. A brightly illuminated place

Choose the answer from the following options. (2005)

Options:

A. B, C and F only

B. A, C and E only

C. A, D and E only

D. B, D and E only

Answer: C

Solution:

Solution:
(c) : Mucor is a filamentous fungus found in the humus of soil decaying fruits, vegetables. It is commonly known as black mould. Most of the Mucor sp. are unable to grow at 37°C and the strains isolated from human infections are usually one of the few thermotolerant Mucor sp. Colonies of Mucor grow rapidly at 25 - 30° C humidity about 90 - 95% and quickly cover the surface of the agar. It requires moist and shady place for its growth. Many sp. of Mucor are responsible for causing roting of fruit and vegetables. A few sp. e.g., Mucor pusillus are pathogenic to man.

Question92

All of the following statements concerning the actinomycetous filamentous soil bacterium *Frankia* are correct except that *Frankia (2005)*

Options:

A. can induce root nodules on many plant species

B. can fix nitrogen in the free-living state

C. cannot fix specialized vesicles in which the nitrogenase is protected from oxygen by a chemical barrier involving triterpene hopanoids

D. like *Rhizobium*, it usually infects its host plant through root hair deformation and stimulates cell proliferation in the host's cortex.

Answer: B

Solution:

Solution:
(b) : Frankia, is a nitrogen fixing symbiotic bacteria. It induces root nodules just like Rhizobium. It is associated symbiotically with the root nodules of several non-legume plants like Casuarina, Alnus, Rubus etc. It cannot fix nitrogen in free state.

Question93

For retting of jute the fermenting microbe used is (2005)

Options:

A. methanophilic bacteria

B. butyric acid bacteria

C. *Helicobactor pylori*

D. *Streptococcus lactin.*

Answer: B

Solution:

(b) : Retting is the process of separating fibres that are held together in close association using a variety of bacteria. Fibres of jute are held together in close association and they are separated by the action of butyric acid bacteria e.g. *Clostridium butyricum.* These plants are immersed in water so that they absorb water and swell. Due to the activity of bacteria, the pectic substances of middle lamella are hydrolysed and the fibres are separated. These separated fibres are used in making of ropes and sacks.

Question94

Basophilic prokaryotes
(2005)

Options:

A. grow and multiply in very deep marine sediments

B. occur in water containing high concentrations of barium hydroxide

C. readily grow and divide in sea water enriched in any soluble salt of barium

D. grow slowly in highly alkaline frozen lakes at high altitudes.

Answer: A

Solution:

Solution:
(a) : Basopilic prokaryotes are facultatively anaerobic bacteria. They grow and multiply in very deep marine sediments. Most basophiles grow better at a pH of 8.5 or higher.

Question95

There exists a close association between the alga and the fungus within a lichen. The fungus
(2005)

Options:

A. provides protection, anchorage and absorption for the algae

B. provides food for the alga

C. fixes the atmospheric nitrogen for the alga

D. releases oxygen for the alga.

Answer: A

Solution:

(a) : Lichens are peculiar dual organisms produced by the intimate association of two organisms: a fungus and an alga. The association between the two organisms is symbiosis. Both the organisms are mutually benefitted in this association and are dependent on each other. The algal cell photosynthesizes with the help of chloroplast. Therefore lichens are autotrophic. A part of these manufactured carbohydrates are used by the alga in its nutrition, the rest is supplied to the fungal partner. The fungus in turn provides water and nutrients which it absorbs from the soil using the rhizoidal hyphae. Thus both the partners get benefitted from each other. The algal partner is called phycobiont and the fungal partner is called mycobiont.

Question96

Which of the following statements is not true for retroviruses? (2004)

Options:

A. DNA is not present at any stage in the life cycle of retroviruses.

B. Retroviruses carry gene for RNA dependent DNA polymerase.

C. The genetic material in mature retroviruses is RNA.

D. Retroviruses are causative agents for certain kinds of cancer in man.

Answer: A

Solution:

Solution:
(a) : Retroviruses contain RNA as genetic material and this RNA is converted to DNA using enzyme reverse transcriptase.

Question97

Viruses that infect bacteria multiply and cause their lysis, are called (2004)

Options:

A. lysozymes

B. lipolytic

C. lytic

D. lysogenic.

Answer: C

Solution:

Solution:
(c) : Viruses like bacteriophage T4 undergo lytic cycle that involves lysis of bacteria. The replication cycle of bacteriophage T4 consists of following phases -
(i) Adsorption of the phage to bacterial or host cell. Then the viral genetic material penetrates into the host cell.
(ii) Eclipse period involves the synthesis of new phage DNA and proteins.
(iii) Maturation involves the assembly of phage DNA into the protein coat.
(iv) Lysis of host cell occurs and releases infective progeny phases.

Question98

Phenetic classification of organisms is based on (2004,2003)

Options:

A. observable characteristics of existing organisms

B. the ancestral lineage of existing organisms

C. dendrogram based on DNA characteristics

D. sexual characteristics.

Answer: A

Solution:

Solution:
(a) : Phenetic classification is a type of numerical taxonomy. In this type of classification the organisms are arranged according to overall similarity of existing organisms based on available characters. It is also called adansonian taxonomy because the same was first attempted by Adanson (1763), of course on the basis of external traits only. Numerical taxonomy evolved around 1950. It has received impetus with the availability of calculating machines and computers. In numerical taxonomy as many characters as possible are employed for evaluating degree of similarity and difference. All characteristics used in analysis are given equal weightage and importance. A proper selection of characters, their organisation and analysis in the light of current knowledge is key to success of this method. A lot of subjectivity can creep in depending upon the judgement of the biosystematist. No weightage is given to the quantity of the character present.

Question99

A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern Azolla is (2004)

Options:

A. Tolypothrix

B. Chlorella

C. Nostoc

D. Anabaena.

Answer: D

Solution:

Solution:
(d) : *Anabaena* is a free living nitrogen fixing cyanobacterium which can form symbiotic association with the water fern *Azolla .*

Question100

During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and (2004)

Options:

A. RNA primers are involved

B. is facilitated by telomerase

C. moves in one direction of the site

D. moves in bi-directional way.

Answer: D

Solution:

(d) : Prokaryotic DNA acts as a single replicating unit called replicon. Each replicon has a particular region where replication starts. It is called origin of replication or ori. In the region of ori, there is a particular nucleotide sequence called autonomic replicating sequence or ARS. Replication proceeds bidirectionally from each ori. A replication fork is produced on each side of ori. Replication will continue till a replication fork meets another replication fork.

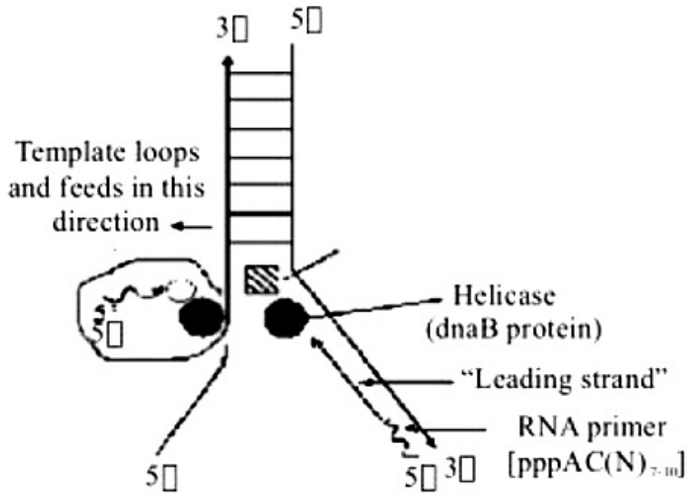


Fig. : DNA replication in prokaryotes.

Question101

Lichens are well known combination of an alga and a fungus where fungus has
(2004)

Options:

A. a saprophytic relationship with the alga

B. an epiphytic relationship with the alga

C. a parasitic relationship with alga

D. a symbiotic relationship with alga.

Answer: D

Solution:

Solution:
Lichens are peculiar dual organisms produced by the intimate association of two organisms: a fungus and an alga. The association between the two organisms is symbiosis. Both the organisms are mutually benefitted in this association and are dependent on each other. The algal cell photosynthesizes with the help of chloroplast. Therefore lichens are autotrophic. A part of these manufactured carbohydrates are used by the alga in its nutrition, the rest is supplied to the fungal partner. The fungus in turn provides water and nutrients which it absorbs from the soil using the rhizoidal hyphae. Thus both the partners get benefitted from each other. The algal partner is called phycobiont and the fungal partner is called mycobiont.

Question102

Chromosomes in a bacterial cell can be 1- 3 in number and
(2003)

Options:

A. are always circular

B. are always linear

C. can be either circular or linear, but never both within the same cell

D. can be circular as well as linear within the same cell.

Answer: A

Solution:

(a) : Bacterial cells do not have nucleus, characteristic of eukaryotic cells. Nuclear material of bacteria lies free in the cell in the form of an irregular, thin, fibrillar and circular single molecule of DNA, called nucleoid or chromatin body. This DNA,

sometimes attached at one or more points to a mesosome, frequently runs parallel to the axis of the cell. Bacterial DNA is not associated with histone protein and does not coil to form welldefined chromosomes during the multiplication. In addition to circular DNA, a small amount of subsidiary extrachromosomal DNA is also present as plasmids or episomes.

Question103

Which one of the following statements about viruses is correct? (2003)

Options:

A. Viruses possess their own metabolic system.

B. All viruses contain both RNA and DNA.

C. Viruses are obligate parasites.

D. Nucleic acid of viruses is known as capsid.

Answer: C

Solution:

Solution:
(c) : Viruses contain a protein coat known as capsid which encloses a single type of nucleic acid, either RNA or DNA. They do not have enzymes for protein synthesis. They multiply only inside the living host cell and for multiplication they take over the machinery of the host cell. Thus viruses are obligatory intercellular parasites. They lack cell division and enzymes for protein synthesis. They do not have cell organelles like mitochondria, Golgi complex, lysosomes, ribosomes etc. so they cannot live or reproduce separately.

Question104

Tobacco mosaic virus is a tubular filament of size (2003)

Options:

A. 300 × 10nm

B. 300 × 5nm

C. 300 × 20nm

D. 700 × 30nm

Answer: C

Solution:

(c) : TMV is rod shaped measuring 300 × 20 nm. It is made of RNA and proteins.

Question105

Viruses are no more "alive" than isolated chromosomes because (2003)

Options:

A. they require both RNA and DNA

B. they both need food molecules

C. they both require oxygen for respiration

D. both require the environment of a cell to replicate.

Answer: D

Solution:

Solution:
Viruses contain a protein coat known as capsid which encloses a single type of nucleic acid, either RNA or DNA. They do not have enzymes for protein synthesis. They multiply only inside the living host cell and for multiplication they take over the machinery of the host cell. Thus viruses are obligatory intercellular parasites. They lack cell division and enzymes for protein synthesis. They do not have cell organelles like mitochondria, Golgi complex, lysosomes, ribosomes etc. so they cannot live or reproduce separately.

Question106

In which kingdom would you classify the archaea and nitrogen-fixing organisms, if the five-kingdom system of classification is used? (2003)

Options:

A. Plantae

B. Fungi

C. Protista

D. Monera

Answer: D

Solution:

(d) : The Kingdom Monera includes all prokaryotes. They are basically unicellular but can be mycelial, colonial and filamentous. They contain peptidogycan in cell wall. Naked circular DNA coiled to form nucleoid without association with histones, ribosomes 70S, thylakoids present photoautotrophs but other membrane bound organelles are absent. Nutrition

is of various types- parasitic, chemoautotrophic, photoautotrophic and saprobic.
Some monerans have the ability to fix nitrogen. Due to presence of these characters in archaea and nitrogen-fixing organisms they are placed undermonera.
All others fungi, plantae, protists and animalia are eukaryotic.

Question107

In five kingdom system, the main basis of classification is (2002)

Options:

A. structure of nucleus

B. mode of nutrition

C. structure of cell wall

D. asexual reproduction.

Answer: B

Solution:

Solution:
(b) : Whittaker's system is based on the following three criteria -
complexity of cell structure.
complexity of the body organization.
mode of nutrition.
On the basis of these criteria, Whittaker divided organisms into five kingdoms. These five kingdoms are monera, protista, algae, fungi and animalia. In the five kingdom classification all, prokaryotes have been placed in kingdom monera, all unicellular eukaryotes in kingdom protista, fungi (except slime moulds and water moulds) in their separate kingdom while kingdom plantae and kingdom animalia have been retained for multicellular, autotrophic and multicellular holozoic organisms respectively.

Question108

Which statement is correct for bacterial transduction? (2002)

Options:

A. Transfer of some genes from one bacteria to another bacteria through virus.

B. Transfer of genes from one bacteria to another bacteria by conjugation.

C. Bacteria obtained its DNA directly from mother cell.

D. Bacteria obtained DNA from other external source.

Answer: A

Solution:

(a) : In transduction, genetic material of one bacterial cell goes to other bacterial cell by agency of bacteriophages or phages (viruses, infecting bacteria). Transduction was first of all reported in *Salmonella typhimurium* by Zinder and Lederberg (1952). Transduction is used for gene mapping and analysis in bacteria and also for strain construction.

Question109

The growth curve of bacterial population in lab is plotted against time. What will be the shape of graph?
(2002)

Options:

A. Sigmoid

B. Hyperbolic

C. Ascending straight line

D. Descending straight line

Answer: B

Solution:

(b) : The growth curve for bacteria is hyperbolic. It shows various stages-lag phase, log phase or exponential phase, steady or stationary phase and decline phase. During lag phase there is very less growth of bacterial cells. In log phase, once the metabolic machinery is running they start multiplying exponentially, doubling in number every few minutes. In stationary phase, booming growth stops and number of bacteria stabilises. Last is death phase when the bacteria die due to lack of nutrients.

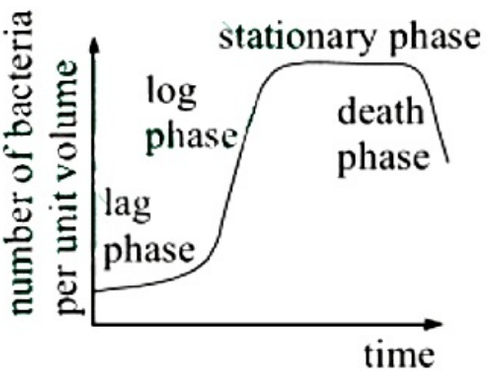


Fig. : Growth Curve

Question110

Some bacteria are able to grow in streptomycin containing medium due to
(2002)

Options:

A. natural selection

B. induced mutation

C. reproductive isolation

D. genetic drift.

Answer: A

Solution:

Solution:
(a) : Normally bacteria cannot survive in antibiotic containing medium but if it does so it must have acquired resistance against that antibiotic. These are well adapted to grow in streptomycin containing medium and thus are more evolved. So due to natural selection only the more evolved and better adapted species is able to survive.

Question111

In bacteria, plasmid is (2002)

Options:

A. extra chromosomal material

B. main DNA

C. non functional DNA

D. repetitive gene.

Answer: A

Solution:

Solution:
(a) : In addition to the nucleoid, bacterial cytoplasm normally contains many small, separate pieces of DNA, called plasmids. These circular DNA units are 1/100 the size of the main nuclear DNA (nucleoid) and are also not enclosed in a membrane structure. When found in cytoplasm, entirely independent of the bacterial chromosome, they replicate autonomously. Sometimes it becomes integrated into the main DNA and replicates with it. During conjugation, the plasmids, sometimes called episomes, help in the transfer of the genetic material between different bacteria. It may carry some genes of resistance to a variety of antibiotics.

Question112

Choose the correct sequence of stages of growth curve for bacteria. (2002)

Options:

A. Lag, log, stationary, decline phase

B. Lag, log, decline, stationary phase

C. Stationary, lag, log, decline phase

D. Decline, lag, log phase, stationary

Answer: A

Solution:

Solution:
The growth curve for bacteria is hyperbolic. It shows various stages-lag phase, log phase or exponential phase, steady or stationary phase and decline phase. During lag phase there is very less growth of bacterial cells. In log phase, once the metabolic machinery is running they start multiplying exponentially, doubling in number every few minutes. In stationary phase, booming growth stops and number of bacteria stabilises. Last is death phase when the bacteria die due to lack of nutrients.

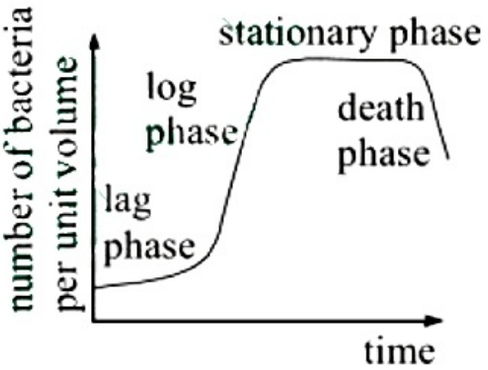


Fig. : Growth Curve

Question113

Which fungal disease spreads by seed and flowers? (2002)

Options:

A. Loose smut of wheat

B. Corn smut

C. Covered smut of barley

D. Soft rot of potato

Answer: A

Solution:

Solution:
(a) : Loose smut of wheat infects the healthy wheat plants at the time of flowering. Here chlamydospores, from smutted heads (blown by the wind) germinate on the stigmas and produce infection threads, infecting the ovaries and stigma. Ultimately, the fungus continues to grow within the embryo, as the seed matures. With the germination of these infected seeds, internal dormant fungal mycelium resumes its activity again. In covered smut of Barley, fungal spores are liberated out only by rupturing the wall of the grains, specially at the time of threshing. This type of infection takes place during the young seedling stage. Seedling infection occurs in covered smut of Barley. Shoot infection occurs in corn smut.

Question114

Which of the following secretes toxins during storage conditions of crop plants?
(2002)

Options:

A. Aspergillus

B. Penicillium

C. Fusarium

D. Colletotrichum

Answer: B

Solution:

Solution:
(a, b) : *Penicillium* and *Aspergillus* both produce toxins in stored seeds and grains. *Aspergillus* produces aflatoxin in fruits, vegetables, food grains and seeds etc. *Penicillium* produces yellow rice toxins in rice, barley and corns.

Question115

Cauliflower mosaic virus contains
(2001)

Options:

A. ss RNA

B. ds RNA

C. ds DNA

D. ss DNA.

Answer: C

Solution:

Solution:
(c) : Cauliflower mosaic virus contain dsDNA. It is circular and shows semi discontinuous type of replication.

Question116

What is true for cyanobacteria?

(2001)

Options:

A. Oxygenic with nitrogenase

B. Oxygenic without nitrogenase

C. Non oxygenic with nitrogenase

D. Non oxygenic without nitrogenase

Answer: A

Solution:

Solution:
(a) : Cyanobacteria are gram negative prokaryotes which are popularly known as blue-green algae. Although cyanobacteria are true prokaryotes, but their photosynthetic system closely resembles with that of eukaryotes because they have chlorophyll-a and photosystem II and they carry out oxygenic photosynthesis. Like the red algae, cyanobacteria use phycobiliproteins as accessory pigments. Photosynthetic pigments and electron transport chain components are located in thylakoid membranes lined with particles called phycobilisomes, which contain phycobilin pigments, particularly phycocyanin and transfer energy to photosystem II. They contain nitrogenous enzyme for nitrogen fixation. This enzyme becomes inactive in the presence of oxygen but the thick walled heterocyst provide suitable anaerobic environment for nitrogenous activity even in aerobic conditions.

Question117

What is true for archaebacteria?
(2001)

Options:

A. All halophiles

B. All photosynthetics

C. All fossils

D. Oldest living beings

Answer: D

Solution:

Solution:
(d) : Archaebacteria are believed to have originated at a time when there were extreme conditions in the biosphere. Even today they are found in environments where other kinds of bacteria cannot survive. So they are considered to be the oldest of the living fossils. *Eg. Methanobacterium, Methonococcus* etc. All of them are not halophiles. Only some forms like *Halobacterium, Halococcus* can survive under extreme saline conditions. All of them are not fossils because many forms are still surviving and flourishing.

Question118

Difference in gram positive and gram negative bacteria is due to (2001)

Options:

A. cell wall

B. cell membrane

C. ribosome

D. cytoplasm.

Answer: A

Solution:

Solution:
(a) : Using Gram stain, developed by Danish physician, Christian Gram in 1884, two kinds of bacteria were noted - those species of bacteria that are decolorized by alcohol are called gram negative and those that retain the stain are called gram positive. This property of bacteria is related with the structure and compositional differences between the walls of gram positive and gram negative forms. In the cell wall of Gram + ve bacteria, both horizontal and vertical peptide linkages are present, due to which mesh is dense and hence the stain does not come out. Further outer layer of cell wall of Gram +ve bacteria is made of teichoic acid. In the cell wall of Gram -ve bacteria, either horizontal or vertical peptide linkage are present, due to which mesh is loose and hence stain comes out. Further outermost layer of cell wall of Gram -ve bacteria is made of lipopolysaccharides.

Question119

Adhesive pad of fungi penetrate the host with the help of (2000)

Options:

A. mechanical pressure and enzymes

B. hooks and suckers

C. softening by enzymes

D. only by mechanical pressure.

Answer: A

Solution:

Solution:
(a) : The adhesive pad of fungi penetrates the host with the help of mechanical pressure and enzymes. It pushes against the cell wall of the host and then releases cellulase to digest cellulose of the host cell wall so that the hypha is able to penetrate the host cell wall.

Question120

Black rust of wheat is caused by
(2000)

Options:

A. Puccinia

B. Ustilago

C. Albugo

D. Phytophthora.

Answer: A

Solution:

Solution:
Black stem rust is caused by *Puccinia graminis tritici* . The genus *Puccinia* includes 700 species, which cause rust diseases of many economic plants such as wheat, barley, oats, etc. It is called a rust because of the reddish brown color of the spores that are found chiefly upon the surface of the host leaves and stems. P. graminis is heteroecious i.e., requiring two hosts, wheat and barberry for the completion of normal life cycle. According to the nature of the spores, the life cycle of the P. graminis is divided into five stages. It is during, teleuto stage, the teliospore (or teleutospores) produce dark brown to black pustules on the surface of stems and leaves of the wheat that results into 'black stem rust of wheat'.

Question121

A system of classification, in which a large number of traits are considered, is
(1999)

Options:

A. natural system

B. phylogenetic system

C. artificial system

D. synthetic system.

Answer: A

Solution:

(a) : There are three systems of classification- artificial, natural and phylogenetic. In the natural system of classification the organisms are arranged on the basis of all known taxonomic characters instead of one or first few. These include morphological, anatomical, cytological, physiological and biochemical characters of the organisms.
The artificial system is based on one or a few characters that are easily observable. The phylogenetic system tries to organize organisms on the basis of their genetic and phylogenetic relationships besides taxonomic characters.

Question122

Photosynthetic bacteria have pigments in (1999)

Options:

A. chromoplasts

B. chromatophores

C. leucoplasts

D. chloroplasts.

Answer: B

Solution:

Solution:
(b): Photosynthetic bacteria have chromatophores which are membrane bound vesicular structures which are extensions of cytoplasmic membrane. They contain photosynthetic pigments along with enzymes and electron carriers for photosynthetic phosphorylation. These pigments are bacteriochlorophyll and bacteriophaeophytin. Leucoplasts, chloroplasts and chromoplasts are different types of plasids which occur in plastids and some protistans.

Question123

Columella is a specialized structure found in the sporangium of (1999)

Options:

A. Spirogyra

B. Ulothrix

C. Rhizopus

D. none of these.

Answer: C

Solution:

(c) : Rhizopus is a saprophytic fungus that grows on dead organic matter. The mycelium is differentiated into three kinds of hyphae rhizoidal, stolons and sporangiophores. The rhizoidal hyphae are for anchorage and absorbing food by secreting enzymes. Stolons grow horizontally over the surface of the substratum. Sporangiophores are specialized hyphae that bear a sporangium at their tip (inside columella a dome shaped sterile portion the sporangia). It helps in dispersal of spores and usually persists even after bursting of the sporangium.

Question124

In the five kingdom system of classification, which single kingdom out of the following can include blue-green algae, nitrogen fixing bacteria and methanogenic archaebacteria?
(1998)

Options:

A. Plantae

B. Protista

C. Monera

D. Fungi

Answer: C

Solution:

Solution:
(c) : R.H. Whittaker had proposed a five kingdom system of biological classification in 1969 . It is based on complexity of cell structure, body organization and mode of nutrition. The kingdom monera includes all prokaryotes. They are basically unicellular with peptidoglycan in cell wall. Naked circular DNA coiled to form nucleoid without association with histones, ribosomes 70 S, thylakoids present in photo autotrophs but other membrane bound organelles are absent. These are heterotrophic, phototrophic or chemotropic in their mode of nutrition. The blue-green algae, nitrogen fixing bacteria and methanogenic archaebacteria are all unicellular prokaryotes so they are included in the kingdom monera.

Question125

Transfer of genetic information from one bacterium to another in the transduction process is through
(1998)

Options:

A. bacteriophages released from the donor bacterial strain

B. another bacterium having special organ for conjugation

C. physical contact between donor and recipient strains

D. conjugation between opposite strain bacterium.

Answer: A

Solution:

(a) : Transduction is the phenomenon of transfer of genetic material from one bacterial cell to another through the agency of virus. The viruses carry a segment of DNA from one host and infect another host which is different from the first one, the latter may inherit some of the properties of the former host due to transfer of DNA segment through infecting phage.

Question126

A bacterium divides every 35 minutes. If a culture containing 10^5 cells per ml is grown for 175 minutes, what will be the cell concentration per ml after 175 minutes?
(1998)

Options:

A. 35×10^5 cells

B. 32×10^5 cells

C. 175×10^5 cells

D. 85×10^5 cells

Answer: B

Solution:

(b) : A bacterium divides every 35 minutes.
In 175 minutes it would be $2^{175/35}$ times $= 2^5$ times.
In 175 minutes 105 bacterium cells would be $= 2^5 \times 10^5 = 32 \times 10^5$ / ml

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Question127

The DNA of E.coli is
(1998)

Options:

A. double stranded and linear

B. double stranded and circular

C. single stranded and linear

D. single stranded and circular.

Answer: B

Solution:

(b): E. coli is a gram-negative, rod shaped, motile or nonmotile bacteria. E. coli contains a double stranded DNA as its genetic material. The DNA is not associated with any histone proteins so it is referred to as naked DNA. This DNA is circular withno free ends.

Question128

The main role of bacteria in the carbon cycle involves (1998)

Options:

A. chemosynthesis

B. digestion or breakdown of organic compounds

C. photosynthesis

D. assimilation of nitrogenous compounds.

Answer: B

Solution:

Solution:
(b) : Bacteria are responsible for maintaining the conditions of life as the earth by virtue of their powers of decomposition of plant and animal bodies by which the limited supply by CO_2 available for photosynthesis is replenished. Thus, they act as decomposers in the carbon cycle. Bacteria mainly function as decomposers in the carbon cycle.

Question129

A few organisms are known to grow and multiply at temperatures of 100 − 105˚C. They belong to (1998)

Options:

A. thermophilic sulphur bacteria

B. hot spring blue-green algae

C. methanogenic archaebacteria

D. marine archaebacteria.

Answer: A

Solution:

(a) : Thermoacidophiles (temperature and acid loving) archaebacteria are found in hot sulphur springs. Although they are microscopic, single celled organisms, they flourish under conditions which would kill higher organisms. These are aerobic bacteria and have the capacity to oxidize sulphur to H_2SO_4 at high temperature and high acidity ($pH = 2.0$). Some of them are also able to reduce sulphur to H_2S under anaerobic conditions. As a rule, they grow best between 80° and $100^\circ C$ and several species do not grow below $80^\circ C$.

Question130

Puccinia forms uredia and (1998)

Options:

A. telia on wheat leaves

B. aecia on barberry leaves

C. pycnia on barberry leaves

D. aecia on wheat leaves.

Answer: A

Solution:

(a) : Puccinia is a macrocyclic and heteroecious rust fungus. It produces uredia and telia stages on wheat plant. The spores produced on wheat are uredospores (stageII) and teleutospores (stage III). Uredospores can re-infect wheat but teleutospores cannot do it. Instead they give rise to basidia (stage IV). Basidiospores infect barberry. Pycnidia (stage I) develop on the upper surface of barberry leaves. Dikaryotisation occurs. It gives rise to aecidial stage (stage zero). Aecidia develop on the lower surface of barberry leaves. They form aecidiospores which infect Wheat. Thus basidial stage is produced on ground and pycnidial and aecidial stages are produced on barberry plant.

Question131

Viruses possess (1997)

Options:

A. ribosomes to synthesize protein

B. organelle for its vital mechanism

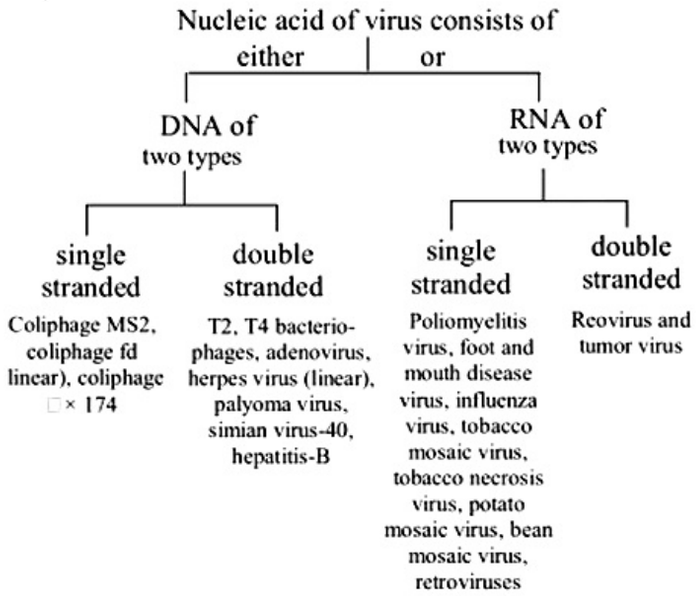
C. either DNA or RNA

D. none of these.

Answer: C

Solution:

(c) : Viruses always contain only a single kind of nucleic acid. It can be either DNA or RNA. Thenucleic acid may occur as single or double strands.



Question132

Which of the following is free-living aerobic non-photosynthetic nitrogen-fixing bacterium?
(1997)

Options:

A. Nostoc

B. Azospirillum

C. Rhizobium

D. Azotobacter

Answer: D

Solution:

(d) : All plants need nitrogen to synthesize proteins, but for this purpose they are unable to utilize atmospheric nitrogen. Nitrogen fixation is brought about by two types of bacteria which are known as nitrogen fixing bacteria. One type is symbiotic nitrogen fixers that are associated with plants *e.g., Rhizobium and Azospirillum.* The other type of these bacteria are free living in the soil *e.g., Azotobacter* and *Nostoc.*
is photosynthetic and Azotobacter is nonphotosynthetic. So that, the free living aerobic non-photosynthetic nitrogen fixing bacterium is Azotobacter.

Question133

The site of respiration in bacteria is
(1997)

Options:

A. ribosome

B. microsome

C. episome

D. mesosome.

Answer: D

Solution:

Solution:
(d) : Mesosomes are complex, intracellular, membranous structures within the cytoplasm, that are formed by the in foldings of the cytoplasmic membrane. Surface of mesosomes have many enzymes which take part in respiration e.g., oxidases and dehydrogenases. Mesosomes are also known to help in the separation of two daughter molecules of DNA during cell division. They are also called mitochondria of bacterial cell.
Ribosomes are cytoplasmic organelles that occur in both prokaryotes and eukaryotes. When plasmids associate temporarily with nucleoid these are called as episomes.

Question134

The hereditary material present in the bacterium E.coli is (1997)

Options:

A. single-stranded DNA

B. double-stranded DNA

C. DNA

D. RNA.

Answer: B

Solution:

Solution:
(b): E. coli is a gram-negative, rod shaped, motile or nonmotile bacteria. E. coli contains a double-stranded DNA as its genetic material. The DNA is not associated with any histone proteins so it is referred to as naked DNA. This DNA is circular withno free ends.

Question135

Genes are packaged into a bacterial chromosome by (1997)

Options:

A. acidic protein

B. actin

C. histones

D. basic protein

Answer: D

Solution:

Solution:
(d) : In bacteria, DNA is highly charged molecule. The adjacent bases are linked by phosphate groups, each with an ionized hydroxyl group. It results in negative charges which are therefore balanced by an equivalent number of cationic groups. These charges are balanced by histones which are basic proteins in case of eukaryotes. Histones are absent in bacterial cells. In bacteria the charges are neutralized by polyamines such as spermine and spermidine and by Mg^{2+}, ions.

Question136

Most of the lichens consist of (1997)

Options:

A. green algae and ascomycetes

B. brown algae and higher plant

C. blue green algae and basidiomycetes

D. red algae and ascomycetes

Answer: A

Solution:

Solution:
(a) : Lichens are peculiar dual organisms produced by the intimate association of two organisms - a fungus and an alga. The association between the two organisms is called symbiosis. On the basis of fungal partner, lichens are of 2 types :
(i) Ascolichens : In which ascomycetes member is the fungal partner. Further in ascolichens, algal partner is mostly member of green algae and rarely blue-green algae.
(ii) Basidiolichens : Where basidiomycetes member is fungal partner. In them algal partner is generally blue-green algae. In 80% cases algal partner is member of green algae or chlorophyceae and in 20% cases, blue-green algae or myxophyceae. Important members of green algae found in lichens are: *Trebauxia, Pleurococcus, Trentepohlia* and *Cladophora.*

Question137

What is the genetic material in influenza virus? (1996)

Options:

A. Double helical DNA

B. RNA

C. single helix DNA

D. None of these

Answer: B

Solution:

Solution:
(b) : Influenza viruses are spherical in shape measuring about 800-1200 Å in diameter. It has a protein capsid that encloses a single stranded RNA. The single stranded RNA is generally linear and constitutes about 10% of the virus particle. RNA is genetic material in other viruses like poliomyelitis, foot and mouth disease virus and tobacco mosaic virus etc.

Question138

BGA (blue green algae) are included in which of the following groups? (1996)

Options:

A. Bryophytes

B. Prokaryotes

C. Protista

D. Fungi

Answer: B

Question139

Azotobacter and Bacillus polymyxa are the examples of (1996)

Options:

A. pathogenic bacteria

B. decomposers

C. symbiotic N_2 fixer

D. non-symbiotic N_2 fixer

Answer: D

Solution:

Solution:
(d) : Symbiosis is a mutually beneficial relationship or interaction between individuals of two different species with none of the two capable of living separately. e.g., *Rhizobium* is associated with root nodules of legumes. It fixes nitrogen for the plant and the plant provides it food and shelter. *Azotobacter* is a free-living bacteria which occurs in the soil and fixes nitrogen directly. Bacillus is also a free living bacteria which acts upon nitrogenous excretions and proteins of dead bodies of living organisms. These are therefore, non-symbiotic N_2 fixing bacteria.

Question140

What are the sex organs provided in some bacteria? (1996)

Options:

A. Sex pili

B. Plasmid

C. Circular DNA

D. Gametes

Answer: A

Solution:

Solution:
(a) : Sex pili are minute and non-flagellar hairlike structures projecting from the wall of many gram negative bacteria and few Gram + ve ones. They are entirely composed of a protein called pilin. They are used as sex organs during conjugation, forms conjugation tube during conjugation. They confer the property of stickiness whereby bacteria tend to adhere to one another (clump formation). They are of two types-long conjugating pili and short attachment pili.
Naked circular DNA is the genetic material which is not enclosed by nuclear membrane non complexed with proteins. It is called nucleoid or genophore. Plasmids (Hayes and Lederberg, 1952) are additional or extrachromosomal small rings of DNA having a few useful but nonvital genes, e.g., For fertility factor, R-factors or resistance factor.

Question141

Which type of DNA is found in bacteria? (1996)

Options:

A. Circular free DNA

B. Membrane bound DNA

C. Straight DNA

D. Helical DNA

Answer: A

Solution:

(a) : Bacterial cells do not have nucleus. Nuclear material of bacteria lies free in the cell in the form of an irregular, thin fibrillar and circular single molecule of DNA called nucleoid or chromatin body. This DNA is sometimes attached at one or more points to a mesosome. Bacterial DNA is not associated with histone proteins and does not coil to form well defined chromosomes during multiplication. This is the basic characteristic of all prokaryotes and bacteria is prokaryotic organism.

Question142

Which one of the following statement about lichens is wrong? (1996)

Options:

A. These grow very rapidly (2 cm per day).

B. They show fungal and algal symbiotic relationships.

C. Some of its species are eaten by reindeers.

D. These are pollution indicators

Answer: A

Solution:

Solution:
(a) : Lichens grow by extending their thallus outwards from either tips or edges. They grow very slowly. Rates of growth can vary from 0.5 mm per year to 500 mm per year. This slow growth rate equates with their long life.

Question143

Mycorrhiza is correctly described as

(1996)

Options:

A. parasitic association between roots and some fungi

B. symbiotic relationship between fungi and roots of some higher plants

C. symbiosis of algae and fungi

D. relation of ants with the stem of some trees

Answer: B

Solution:

(b) : Association between roots of higher plants e.g., pine, birch and fungal hyphae is called mycorrhiza. It exhibits the phenomenon of symbiosis. Here both the organisms in association are mutually benefitted. In this, fungal hyphae take nutrition from the plant and in return increase surface area for absorption of water and minerals for the plant. Mycorrhizal roots occur in superficial layers of the soil. They are thick, irregular with wooly covering devoid of root hairs and root cap. They are of two types ectomycorrhiza and endomycorrhiza. In the roots of Pinus is seen ectotrophic mycorrhiza as the root hairs are poorly developed. In ectomycorrhiza, the fungus partner is commonly a basidiomycete. It lives in intercellular spaces of cortex and forms a thick wooly covering on the outside. In endomycorrhiza, the fungus is commonly a zygomycete. The tips of fungal hyphae pass into cortical cells producing swollen vesicles or finely branched masses called arbuscules. Endomycorrhiza is, therefore, also called VAM or vesicular-arbuscular mycorrhiza. Outer covering is small. Parasitism is a phenomenon that involves a parasite which lives in constant association of the host and gets its food directly or indirectly without killing the host. Antagonism is the inhibition of growth of one organism by another. Endemism is the permanent occurrence of an organism inside another organism.

Question144

The tailed bacteriophages are
(1995)

Options:

A. motile on surface of bacteria

B. non-motile

C. motile on surface of plant leaves

D. actively motile in water

Answer: A

Solution:

Solution:
(a) : The tailed bacteriophages contain a hollow helical tail which serves both as cell attachment organ and as a tube that facilitates the entry of nucleic acid into the host cell. The tail consist of tail plate and the caudal fibres.

Question145

A large number of organic compounds can be decomposed by (1995)

Options:

A. Azotobacter

B. chemolithotrophs

C. Mycoplasma

D. Pseudomonas.

Answer: B

Solution:

Solution:
(b) : Chemolithotrophs can derive the energy required for growth from the oxidation of inorganic components.

Question146

The black rust of wheat is a fungal disease caused by (1995)

Options:

A. Albugo candida

B. Puccinia graminis tritici

C. Melampsora lini

D. Claviceps purpurea

Answer: B

Solution:

Solution:
(b) : *Puccinia graminis tritici* belongs to basidiomycotina and causes black rust of wheat. It is internal obligate parasite. It is found everywhere, where wheat is grown. The teleutospores of the fungus causes the rust. They are produced inside teleutosori. These telia form elongated, dark brown to black pustules on the surface of stems and leaves of the wheat. *Albugo candida* causes white rust of crucifers. *Melampsora lini* causes linseed rust. *Claviceps purpurea* causes ergot of graminae.

Question147

Tobacco mosaic virus TMV genes are (1994)

Options:

A. single stranded RNA

B. double stranded DNA

C. proteinaceous

D. double stranded RNA

Answer: A

Solution:

Solution:
(a) : Tobacco Mosaic Virus is a ribovirus and contains single stranded RNA. It was proved by the experiments of Frankel Conart that RNA is the genetic material in this virus. It does not contain any DNA and is composed of 6% RNA surrounded by a hollow cylinder of portion subunits. Double stranded RNA is found in Reovirus and Tumor virus. Retroviruses have two copies of single stranded RNA

Question148

Phylogenetic classification is one which is based on (1994)

Options:

A. overall similarities

B. utilitarian system

C. habits of plants

D. common evolutionary descent

Answer: D

Solution:

Solution:
(d) : Phylogenetic systems of classification bring out evolutionary relationships of organisms. Phylogenetic systems of classification came into existence after acceptance of doctrine of evolution and natural selection propounded by Charles Darwin in his book "On the origin of Species" by means of Natural Selection. Darwin had put forward the view that the present day plants/animals originated from some ancestral ones after undergoing some periodical changes. So the phylogenetic classification is based on the evolutionary descent of a group of organisms and the relationships are depicted through a phylogram and a cladogram.

Question149

The protists have
(1994)

Options:

A. only free nucleic acid aggregates

B. membrane bound nucleo proteins lying embedded in the cytoplasm

C. gene containing nucleoproteins condensed together in loose mass

D. nucleoprotein in direct contact with the rest of the cell substance

Answer: B

Solution:

Solution:
(b) : Protists include all unicellular and colonial eukaryotes except those of green and red algae. They are broadly divided into three groups photosynthetic, slime moulds and protozoans. The protistan cells are typically eukaryotic having membrane bound organelles like mitochondria, chloroplasts, golgi bodies, endoplasmic reticulum, nucleus etc. Nucleus is well defined. Protists can be uninucleate, binucleate or multinucleate. The genetic material is linear DNA, enclosed by nuclear envelope, complexed with proteins and organised into distinct chromosomes.

Question150

Organisms, which fix atmospheric nitrogen in the soil, fall under the category of
(1994)

Options:

A. bacteria

B. green algae

C. soil fungi

D. mosses

Answer: A

Solution:

(a) : A few free living bacteria are able to pick up dinitrogen from the soil atmosphere and convert it into organic nitrogenous materials like amino acids. e.g. Azotobacter. Symbiotic nitrogen fixing bacteria of the genus Rhizobium occur in the root nodules of a number of legumes. Root nodules containing symbiotic nitrogen bacteria also occur in Casuarina and Alnus. Leaf nodules containing such bacteria are found in Ardisia. Many cyanobacteria (blue-green algae) fix atmospheric nitrogen due to presence of heterocyst.

Question151

Transduction in bacteria is mediated by (1994)

Options:

A. plasmid vectors

B. phage vectors

C. cosmids

D. F-factors

Answer: B

Solution:

Solution:
(b) : In transduction, genetic material of one bacterial cell goes to other bacterial cell by agency of bacteriophages or phages (viruses, infecting bacteria). Transduction was first of all reported in Salmonella typhimurium by Zinder and Lederberg (1952). Transduction is used for gene mapping and analysis in bacteria and also for strain construction.

Question152

A non-photosynthetic aerobic nitrogen fixing soil bacterium is (1994,1990)

Options:

A. Rhizobium

B. Clostridium

C. Azotobacter

D. Klebsiella

Answer: C

Solution:

Solution:
(c) : A non-photosynthetic aerobic nitrogen fixing soil bacterium is *Azotobacter. Azotobacter* is free living soil bacteria that are able to pick up dinitrogen from the soil and fixes it into organic nitrogenous material like amino acid.

Question153

Mycorrhiza exhibits the phenomenon of (1994)

Options:

A. parasitism

B. symbiosis

C. antagonism

D. endemism

Answer: B

Solution:

Association between roots of higher plants e.g., pine, birch and fungal hyphae is called mycorrhiza. It exhibits the phenomenon of symbiosis. Here both the organisms in association are mutually benefitted. In this, fungal hyphae take nutrition from the plant and in return increase surface area for absorption of water and minerals for the plant. Mycorrhizal roots occur in superficial layers of the soil. They are thick, irregular with wooly covering devoid of root hairs and root cap. They are of two types - ectomycorrhiza and endomycorrhiza. In the roots of Pinus is seen ectotrophic mycorrhiza as the root hairs are poorly developed. In ectomycorrhiza, the fungus partner is commonly a basidiomycete. It lives in intercellular spaces of cortex and forms a thick wooly covering on the outside. In endomycorrhiza, the fungus is commonly a zygomycete. The tips of fungal hyphae pass into cortical cells producing swollen vesicles or finely branched masses called arbuscules. Endomycorrhiza is, therefore, also called VAM or vesicular-arbuscular mycorrhiza. Outer covering is small. Parasitism is a phenomenon that involves a parasite which lives in constant association of the host and gets its food directly or indirectly without killing the host. Antagonism is the inhibition of growth of one organism by another. Endemism is the permanent occurrence of an organism inside another organism.

Question154

Schizont stage of Plasmodium occurs in human cells (1993)

Options:

A. erythrocytes

B. liver cells

C. erythrocytes and liver cells

D. erythrocytes, liver cells and spleen cells

Answer: C

Solution:

(c) : Schizont stage of Plasmodium occurs in human erythrocytes and liver cells. Within the human blood the sporozoites, circulates about half an hour and enters into the liver cell. The kupffer cells of the liver clear the sporozoites from the blood stream and kill many of the organisms. A fraction of sporozoites escape destruction, however, and penetrate the hepatocytes where they take up the residence. Here they multiply by schizogony.

Question155

If all ponds and puddles are destroyed, the organism likely to be destroyed is
(1993)

Options:

A. Leishmania

B. Trypanosoma

C. Ascaris

D. Plasmodium

Answer: D

Solution:

Solution:
(d) : Plasmodium is digenetic i.e., it completes its life cycle in two hosts, asexual cycle in man and sexual cycle in Anopheles mosquito. The breeding places of this mosquito is ponds, marshes, swampy areas etc. So, if all the ponds and puddles are destroyed, Anopheles will not be able to survive leading to destruction of its parasite, Plasmodium.

Question156

Genophore/bacterial genome or nucleoid is made of
(1993)

Options:

A. histones and nonhistones

B. RNA and histones

C. a single double stranded DNA

D. a single stranded DNA

Answer: C

Solution:

(c) : Bacteria has no nuclear membrane hence it is called as nucleoid. The genetic material is referred to as genophore. Genophore is the bacterial chromosome. It has a double stranded circular supercoiled DNA. DNA has about 10,000 genes in E.coli. Double stranded DNA in bacteria is without histones.

Question157

Escherichia coli is used extensively in biological research as it is (1993)

Options:

A. easily cultured

B. easily available

C. easy to handle

D. easily multiplied in host

Answer: A

Solution:

Solution:
(a) : E. coli bacteria acts as a human symbionts and it is found in human intestine, synthesize vitamin K and B and also help in food fermentation. It is easily cultured in any nutrient medium in the laboratory.

Question158

The part of life cycle of malarial parasite Plasmodium vivax, that is passed in female Anopheles is (1992)

Options:

A. sexual cycle

B. pre-erythrocytic schizogony

C. exoerythrocytic schizogony

D. post-erythrocytic schizogony

Answer: A

Solution:

(a) : Plasmodium has two hosts.
(i) Female Anopheles mosquito: Here the sexual phase of the malarial parasite occurs and it is considered the definitive host of malarial parasite.
(ii) Human beings : Here the asexual phase of malarial parasite occurs. It is considered as the intermediate host. Options (b), (c) and (d) are the stages of the asexual phase of Plasmodium.

Question159

Bacteria lack alternation of generation because there is (1992,1991)

Options:

A. neither syngamy nor reduction division

B. distinct chromosomes are absent

C. no conjugation

D. no exchange of genetic material

Answer: A

Solution:

Solution:
(a) : In sexual reproduction, syngamy and meiotic division takes place but in bacteria, during sexual reproduction there is no formation of gametes hence no syngamy and reduction division occurs, bacteria lack alternation of generation. Conjugation and exchange of genetic material takes place in bacteria.

Question160

Organisms which are indicator of SO_2 pollution of air (1992)

Options:

A. mosses

B. lichens

C. mushrooms

D. puffballs

Answer: B

Solution:

Solution:
(b) : Lichens are found in Artic Tundra region where no other plant can grow. Lichens prefer to grow in pollution free environment. They are often used as a indicator of pollution and also they are very sensitive to SO_2. They are first to die in a polluted environment (more SO_2).

Question161

An important criterion for modern day classification is (1991)

Options:

A. resemblances in morphology

B. anatomical and physiological traits

C. breeding habits

D. presence or absence of notochord

Answer: B

Solution:

Solution:
(b) : Taxonomy and classification are a part of the broader field of systematics which is the study of diversity of organisms. Classification of a part of systematics as it lists the unique characters of each taxon.

Question162

In Amoeba and Paramecium osmoregulation occurs through (1991)

Options:

A. pseudopodia

B. nucleus

C. contractile vacuole

D. general surface.

Answer: C

Solution:

(c) : In Amoeba and Paramecium, osmoregulation occurs through contractile vacoule. Osmoregulation is a phenomenon in which contractile vacuole plays an important role in maintaining the water balance of the cell. Paramecium contains two contractile vacuoleswhich have fixed position. One contractile vacuole is present near the anterior end while another is present towards posterior end of the body. Each contractile vacuole is surrounded by 5-12 radial canals. Excess of water is transferred from thecytoplasm to the radial canals. The latter pour water into the contractile vacuole. The contractile vacuoleexpels water outside the body. Thus the contractile vacuoles and radial canals are for osmoregulation. In Amoeba the endoplasm, at its posterior end,contains a single, clear rounded and pulsating contractile vacuole, filled with a watery fluid and enclosed by a unit membrane. Surrounding this membrane is a region containing many tiny feeder vacuoles and mitochondria. It helps in the osmoregulatory and excretory activities of the animal.

Question163

African sleeping sickness is due to (1991)

Options:

A. Plasmodium vivax transmitted by tse-tse fly

B. Trypanosoma lewsii transmitted by bed bug

C. Trypanosoma gambiense transmitted by Glossina palpalis

D. Entamoeba gingivalis spread by housefly

Answer: C

Solution:

Solution:
(c) : Trypanosoma gambiense is the parasitic zooflagellate which causes one of the deadliest ailments in human beings called sleeping sickness or trypanosomiasis. The disease is common in humid and subhumid zones of the African continent. The disease is transmitted by shade loving tse-tse fly (Glossina palpalis) which acts as the vehicle that carries the culprit protozoan parasite.

Question164

Malignant tertian malarial parasite, belongs to class (1991)

Options:

A. *Plasmodium falciparum*

B. P. *vivax*

C. P. *ovale*

D. P. *malariae*.

Answer: A

Solution:

Solution:
(a) : Plasmodium falciparum is the greatest killer of human beings over most parts of Africa and else where in tropics. It causes malignant (or pernicious or cerebral or tropical) tertian malaria. This malaria is most harmful. Plasmodium vivax causes benign tertian malaria. Plasmodium malariae causes quartan malaria. Plasmodium ovale is the rarest of the four species which infect man and it causes mild tertian malaria.

Question165

Who discovered Plasmodium in R.B.C. of human beings? (1991)

Options:

A. Ronald Ross

B. Mendel

C. Laveran

D. Stephens

Answer: C

Solution:

Solution:
(c) : Laveran discovered that malaria is caused by protozoan parasite (Plasmodium) in 1880 . He discovered Plasmodium and got nobel prize in 1907 .Sir Ronald Ross in 1897, a doctor in Indian Army, established that malarial parasite is transmitted by the bite of a female Anopheles mosquito and in 1902, he got Nobel prize for this discovery.

Question166

Name the organisms which do not derive energy directly or indirectly from sun. (1991)

Options:

A. Chemosynthetic bacteria

B. Pathogenic bacteria

C. Symbiotic bacteria

D. Mould

Answer: A

Solution:

Solution:
(a) : Chemosynthetic bacteria do not derive energy directly or indirectly from sun. The source of energy of these bacteria is inorganic substances. They utilise the energy liberated by oxidation of inorganic compounds and synthesize organic compounds.

Question167

Plasmodium, the malarial parasite, belongs to class (1990)

Options:

A. sarcodina

B. ciliata

C. sporozoa

D. dinophyceae

Answer: C

Solution:

Solution:
(c) : These protozoans are adapted to parasitic mode of life. All of them are endoparasites: Locomotory organelles (cilia, flagella, pseudopodia, etc.) are absent. Organelles connected with ingestion are absent. Nutrition is parasitic (absorptive). Sexual reproduction takes place through syngamy. It is followed by spore formation, hence sporozoans. Life cycle consists of two distinct asexual and sexual phases. They may be passed in one (monogenetic) or two different hosts (digenetic).

Question168

Amoebiasis is prevented by (1990)

Options:

A. eating balanced food

B. eating plenty of fruits

C. drinking boiled water

D. using mosquito nets

Answer: C

Solution:

Solution:
(c) : Amoebiasis can be prevented by drinking boiled water as it mainly occurs by ingestion of cysts of E. histolytica in food or drinks. The contamination of food or drinks occurs by (i) unhygienic habits of food handlers who by habit scratch the amus and then put the fingers in the food which they serve,(ii) habit of defecating in open fields causing contamination of vegetables and then washing the bottom in ponds causing the contamination of water, (iii) transmission of cysts from stools to food and drinks by flies and cockroaches. So, one should take following preventive measures :
(I) Proper sanitation of roads, streets, lanes and open drains.
(II) Purification of drinking water (by boiling).
(III) Proper disposal of sewage.

(IV) Covering of the food articles by the traders.
(V) Chemical treatment of huma faeces to be used as fertilizer.

Question169

Which is true about Trypanosoma? (1990)

Options:

A. Polymorphic

B. Monogenetic

C. Facultative parasite

D. Non-pathogenic

Answer: A

Solution:

(a) : Trypanosoma is polymorphic i.e. it has more than one form. It has at least four forms that are recognized on the basis of the positions of kinetoplast and blepharoplast and the course taken by the flagellum. Two or more such forms occur either in one or both the hosts in the life cycles of various species of Trypanosoma. These forms are
(i) Leishmanial (amastigote) : Round or oval form with a nucleus, blepharoplast and kinetoplast. Flagellum reduced and fibril-like, embedded in cytoplasm.
(ii) Leptomonad (promastigote) : Body elongate, nucleus large and anteriorly located blepharoplast and kinetoplast. Flagellum short and unattached.
(iii) Crithidial (epimastigote) : Body elongate. Blepharoplast and kinetoplast placed immediately anterior to nucleus. Undulating membrane inconspicuous.
(iv) Trypanosomid (trypomastigote) : Body elongate and slender. Blepharoplast and kinetoplast situated at or near posterior end. Undulating membrane conspicuous.
Trypanosoma is digenetic i.e. it completes its life cycle in two hosts. It is an obligate parasite and is pathogenic.

Question170

Genetic information in Paramecium is contained in (1990)

Options:

A. micronucleus

B. macronucleus

C. both micronucleus and macronucleus

D. mitochondria

Answer: A

Solution:

(a) : Paramecium contains a single large macronucleus and one small micronucleus. The macronucleus controls metabolism such as feeding and maintaenance, whereas the micronucleus takes an important role in reproduction and stores genetic information, hence it is also termed as reproductive nucleus whereas macronucleus is termed as vegetative nucleus.

Question171

The infective stage of malarial parasite, Plasmodium that enters human body is
(1990)

Options:

A. merozoite

B. sporozoite

C. trophozoite

D. minuta form

Answer: B

Solution:

Solution:
(b) : The infective stage of Plasmodium is a minute organism called sporozoite. When the mosquito bites man, sporozoites present in the salivary gland of female Anopheles mosquito are injected into the blood of the man. These sporozoites are spindle-shaped or sickle-shaped uninucleate organisms capable of wrigging (wormlike) movements. Each sporozoite consists of elastic pellicle, cytoplasm and nucleus.

Question172

The main difference in Gram +ve and Gram -ve bacteria resides in their
(1990)

Options:

A. cell wall

B. cell membrane

C. cytoplasm

D. flagella

Answer: A

Solution:

(a) : Danish bacteriologists Christian Gram for the first time classified bacteria on the basis of the cell wall into two groups - Gram + ve and Gram -ve by staining with crystal violet and safranin. Gram +ve cell walls are less complex with peptidoglycan compounds and proteins and no lipids in the cell wall. Whereas in Gram -ve cell walls are more complex with peptidoglycan compounds, phospholipids and lipopolysaccharides and contains 20% lipids.

Question173

Which one belongs to monera? (1990)

Options:

A. Amoeba

B. Escherichia

C. Gelidium

D. Spirogyra

Answer: B

Solution:

Solution:
(b) : All prokaryotic organisms come under Kingdom Monera. Escherichia coli is a bacterium. Monera includes bacteria, mycoplasmas, cyanobacteria (blue green algae) and actinomycetes.

Question174

Absorptive heterotrophic nutrition is exhibited by (1990)

Options:

A. algae

B. fungi

C. bryophytes

D. pteridophytes

Answer: B

Solution:

(b) : The true fungi or the eumycetes are special types of achlorophyllous thallophytic organisms living a parasitic or a saprophytic mode of existence; they are always heterophytes and never autophytes. They depend on others for food, but all other groups as algae, bryophytes and pteridophytes are chlorophyll containing green plants that are autotrophic.

Question175

System of classification used by Linnaeus Was (1989)

Options:

A. natural system

B. artificial system

C. phylogenetic system

D. asexual system

Answer: B

Solution:

Solution:
(b) : Linnaeus put forward an "Artificial system" of plant classification which was based on sexual characters like cryptogamia, monoecia, monandria, diandria, polyandria etc. It is commonly also called as sexual system of plant classification.

Question176

Artificial system of classification was first used by (1989)

Options:

A. Linnaeus

B. De Candolle

C. Pliny the Edler

D. Bentham and Hooker

Answer: A

Solution:

(a) : Artificial system of classification was first used by Linnaeus. The cryptogams were included in flowering plants. Linnaeus system is known as sexual system of classification. He classified on the basis of number, size and union of sex organs.

Question177

A bite of tse-tse fly may pass to humans (1989)

Options:

A. Leishmania donovani

B. Trypanosoma gambiense

C. Entamoeba histolytica

D. Plasmodium vivax

Answer: B

Solution:

Solution:
Trypanosoma gambiense is the parasitic zooflagellate which causes one of the deadliest ailments in human beings called sleeping sickness or trypanosomiasis. The disease is common in humid and subhumid zones of the African continent.The disease is transmitted by shade loving tse-tse fly (Glossina palpalis) which acts as the vehicle that carries the culprit protozoan parasite.

Question178

Malaria fever coincides with liberation of (1989)

Options:

A. cryptomerozoties

B. metacryptomerozoites

C. merozoites

D. trophozoites

Answer: B

Solution:

(b) : Symptoms of malaria first appear several days after the infection of the malaria parasite in man. This interval of time or the incubation period is utilized by the parasites to increase their progeny. To establish malarial symptoms, it is necessary that a large number of organisms must continue erythrocytic cycle at a time. A healthy person acquires infection when a female Anopheles mosquito, containing infective stages of parasite (sporozoites) in its salivary glands,

bites him for sucking his blood. Once within the human blood, the sporozoites get into liver to invade the hepatic cells. Here they multiply asexually by schizogony. Liver schizogony has two phases, preerythrocytic and exo-erythrocytic:
Pre-erythrocytic phase : After penetrating a hepatic cell each sporozoite becomes a cryptozoite. It grows for a number of days and becomes a spherical and non-pigmented schizont. It divides by schizogony (multiple fission) and forms a large number of uninucleate cells, the cryptomerozoites. During preerythrocytic schizogony, blood remains sterile and its inoculation does not produce infection. Exo-erythrocyic phase : Cryptomerozoites enter fresh liver cells to become metacryptozoites. They undergo schizogony similar to the previous one producing enormous number of metacryptomerozoites.
Metacryptomerozoites, after escaping into blood stream, invade the erythrocytes or red blood corpuscles. This starts the erythrocytic schizogony. With erythrocytic schizogony, the symptoms of malaria starts appearing.

Question179

Trypanosoma belongs to class (1989)

Options:

A. sarcodina

B. zooflagellata

C. ciliata

D. sporozoa

Answer: B

Solution:

(b) : On the basis of locomotory organelles the protozoan protists are divided into four groups Mastigophora, Sarcodina, Sporozoa and Ciliata. Trypanosoma belongs to class zooflagellata which comes under the group mastigophora. The characteristics are :
(i) These zooflagellates are generally uninucleate, occasionally multinucleate.
(ii) The body is covered by a firm pellicle.
(iii) Nutrition is holozoic, parasitic and saprobic.
(iv) Reserve food is glycogen.

Question180

The vector for sleeping sickness is (1989)

Options:

A. housefly

B. tse-tse fly

C. sandfly

D. fruit fly

Answer: B

Solution:

Trypanosoma gambiense is the parasitic zooflagellate which causes one of the deadliest ailments in human beings called sleeping sickness or trypanosomiasis. The disease is common in humid and subhumid zones of the African continent.The disease is transmitted by shade loving tse-tse fly (Glossina palpalis) which acts as the vehicle that carries the culprit protozoan parasite.

Question181

The causal organism for African sleeping sickness is (1989)

Options:

A. *Trypanosoma cruzi*

B. T. *rhodesiense*

C. T. *tangela*

D. T. *gambiense*

Answer: D

Solution:

Solution:
(d) : Trypanosoma gambiense was first observed by Forde in 1901 . It causes African sleeping sickness. The disease, also called trypanosomiasis, is found in western and central parts of Africa. The parasite is transmitted by blood sucking tse-tse fly, Glossina palpalis. Mouth and contractile vacuole are absent. Food is absorbedthrough the body surface. The parasite multiplies by fission. In human beings the parasite lives in the blood plasma. It causes trypanosoma fever. It is accompanied by glandular swelling. Later the parasite enters cerebrospinal fluid and damages the brain. It makes the patient lethargic and unconscious. Because of it, the disease is called sleeping sickness. If untreated, the disease leads to death.

Question182

Lichens indicate SO_2 pollution because they (1989)

Options:

A. show association between algae and fungi

B. grow faster than others

C. are sensitive to SO_2

D. flourish in SO_2 rich environment

Answer: C

Solution:

(c) : Lichens are found in Artic Tundra region where no other plant can grow. Lichens prefer to grow in pollution free environment. They are often used as a indicator of pollution and also they are very sensitive to SO_2. They are first to die in a polluted environment (more SO_2).

Question183

Classification given by Bentham and Hooker (1988)

Options:

A. artificial

B. natural

C. phylogenetic

D. numerical

Answer: B

Solution:

(b) : Classification given by Bentham and Hooker is Natural System. Monocots were placed after dicots; closely related families were separated; gymnosperms were placed between dicots and monocots

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