

- Science is proper and perfect knowledge of everything.
- Biology : The study of living objects.
- Biology is divided into two branches : (1) Botany (2) Zoology
- Botany : This science investigates the internal and external structures of plants through evolutionary and phylogenetical aspect.
- Botanical science represents changes in internal and external structure of plants based on evolution and speciation. By classification characteristics and functions of plants, cellular structure, Habitat, Adaptations, Nutrition, Interrelations, Reproduction, Life cycle, Importance etc. become more clear.

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- (1) The study of living objects is called as
 (A) Biology (B) Chemistry (C) Physics (D) B and C
- (2) The first formed life is known as
 (A) Fungi (B) Plant kingdom (C) Monera (D) Protista
- (3) Which is the main branch of biology ?
 (A) Botany (B) Zoology (C) Biochemistry (D) A and B
- (4) Which are the two different forms of life of protista ?
 (A) Immobile plants (B) Mobile animals (C) Mobile plants (D) A and B
- (5) Botany deals with the study of
 (A) External structures of plants (B) Internal structures of plants
 (C) Interrelationship of plants (D) A, B, C All

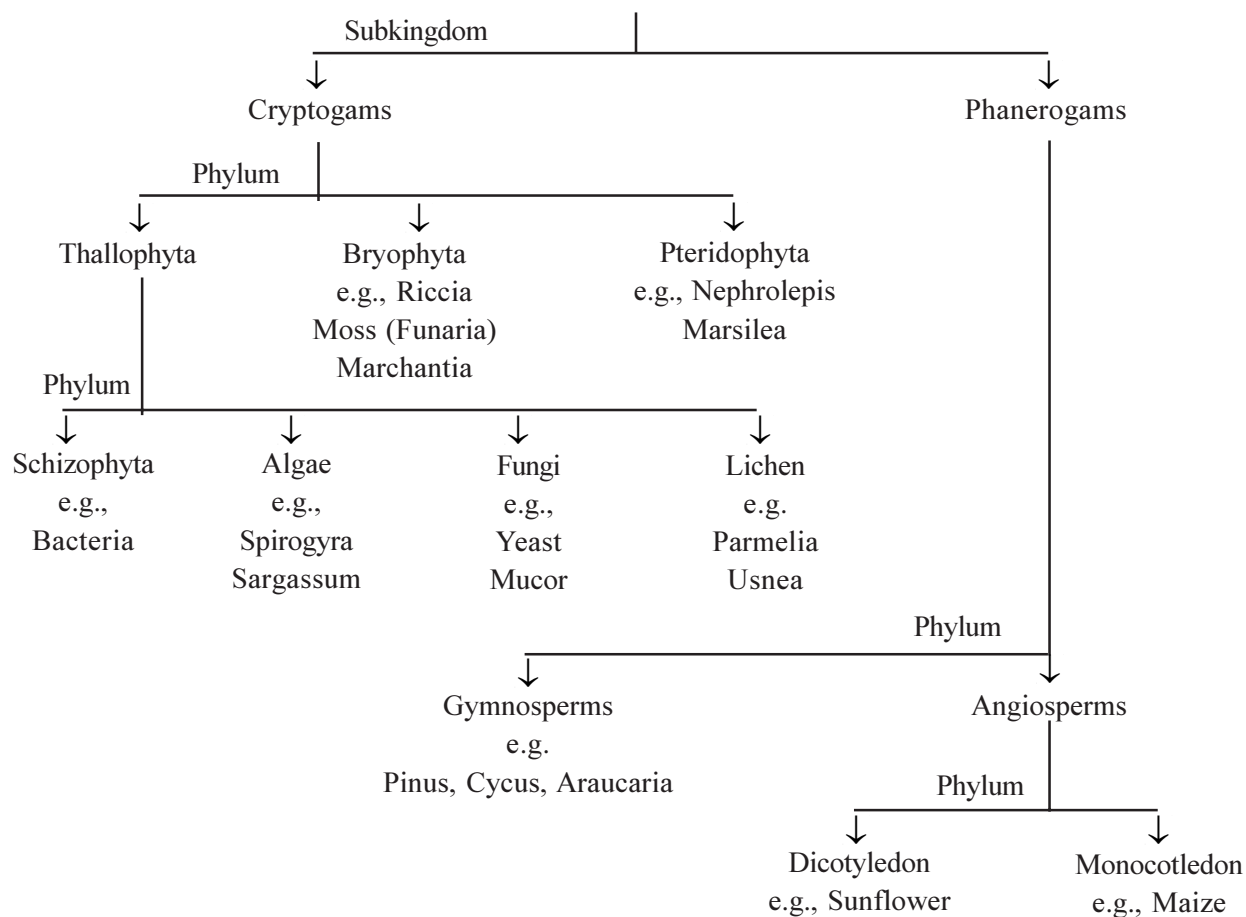
Answers : (1-A), (2-D), (3-D), (4-D), (5-D)

• **Plant kingdom :**

Scientist Eichler has classified the plant kingdom into two main group :

- (1) Flowerless or seedless plants-cryptogames (2) Flowering or seed bearing plant phanerogames
- Nonflowering or seedless plants are called cryptogams.
 - Cryptogams are divided into three groups :
 (1) Thallophyta (2) Bryophyta (3) Pteridophyta
 - Phanerogames are divided into two groups :
 (1) Gymnosperms (2) Angiosperms
 - The bryophyta, pteridophyta and phanerogams are included in embryophyta.

Kingdom - Plant



- (6) How many groups of plant kingdom has been classified by Eichler ?
 (A) Two (B) Three (C) Four (D) Five
- (7) How many divisions are there of Cryptogams ?
 (A) Three (B) Two (C) Four (D) Five
- (8) Which of the following includes Thallophyta ?
 (A) Angiosperms (B) Gymnosperms
 (C) Cryptogams (D) Phanerogams
- (9) Marchantia and Marsilea are included in which division respectively ?
 (A) Bryophyta, Thallophyta (B) Bryophyta, Pteridophyta
 (C) Moncot, Dicot (D) Pteridophyta, Bryophyta
- (10) What is included in achlorophyllous phylum ?
 (A) Lichen (B) Fungi (C) Algae (D) Schizophyta
- (11) Which division includes Araucaria ?
 (A) Pteridophyta (B) Dicot (C) Angiosperms (D) Gymnosperms
- (12) Which of the following is included embryophyta ?
 (A) Bryophyta (B) Pteridophyta (C) Phanerogams (D) A, B, C All

Answers : (6-A), (7-A), (8-C), (9-B), (10-B), (11-D), (12-D)

• **Five kingdom classification :**

R. H. Whittaker (1969) gave five kingdom classification on the basis of nucleus, cell structure, Nutrition and major ecological role.

(1) Monera (2) Protista (3) Fungi (4) Plantae (5) Animalia

A Greek Naturalist Theophrastus (370 - 285 B.C.) classified plants into four groups based on their habitat. Theophrastus is regarded as Father of Botany.

A swedish naturalist Linnaeus classified plants into 24 groups on the basis of sexual characters. Linnaeus (1770 – 1778) is considered as the father of Taxonomy.

- (13) Five kingdom classification of plants was given by
- (A) R. H. Whittaker (B) Carolas Linnaeus (C) Theophrastus (D) Eichler
- (14) Who is considered as the father of Botany ?
- (A) Whittaker (B) Theophrastus (C) Eichler (D) Linnaeus
- (15) Who is considered as the father of Taxonomy ?
- (A) Whittaker (B) Linnaeus (C) Eichler (D) Theophrastus
- (16) How many groups have been divided by Theophrastus and Linnaeus ?
- (A) 24, 4 (B) 4, 24 (C) 5, 4 (D) 2, 3
- (17) Which criteria have been used for plant classification by Theophrastus and Linnaeus ?
- (A) Habitat (B) Sexual characters (C) Importance (D) A and B
- (18) In which kingdom organisms having nucleoid and without membrane bound organelles are included ?
- (A) Protista (B) Fungi (C) Monera (D) Plant
- (19) Cyanobacteria are included in
- (A) Fungi (B) Protista (C) Plant (D) Monera
- (20) In which kingdom dino flagellates are included ?
- (A) Plant kingdom (B) Animal kingdom (C) Protista (D) Monera
- (21) Which mode of nutrition occurs in prokaryotes ?
- (A) Saprophytic (B) Autotrophic (C) Heterotrophic (D) B and C
- (22) In which plant embryo is not formed as a result of sexual reproduction ?
- (A) Yeast (B) Mucor
(C) Mushroom and slime mould (D) A, B, C All
- (23) Which substance is present in cell wall of fungi ?
- (A) Carbohydrates (B) Chitin (C) Lipid (D) Pectin
- (24) Which kingdom includes all multicellular, aquatic or terrestrial eukaryotic organisms ?
- (A) Monera (B) Plant kingdom (C) Animal kingdom (D) Fungi
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- (25) In which plant embryo is not formed as a result of sexual reproduction ?
 (A) Bryophytes (B) Pteridophytes (C) Algae (D) Angiosperms
- (26) Which kingdom is kingdom of Prokaryotes ?
 (A) Protista (B) Fungi (C) Plantae (D) Monera
- (27) Which fungi is structurally unicellular ?
 (A) Bread mould (B) Slime mould (C) Mushroom (D) Yeast

Answers : (13-A), (14-B), (15-B), (16-B), (17-D), (18-C), (19-D), (20-C), (21-D), (22-D), (23-B), (24-B), (25-C), (26-D), (27-D)

• **Three-domains classification :**

The three domains classification system was given by Carl Woese. In this system prokaryotic and eukaryotic organisms are divided into three domains :

(1) Archae domain :

- They are prokaryotic cells without nuclear membrane.
- Cell wall does not contain peptidoglycan.
- Archaea live in extreme condition.
- Example : Methanogens, Halophiles, Thermoacidophiles.

(2) Bacteria domain :

- They are prokaryotic cell. Cell wall is made up of peptidoglycan. This kingdom includes most pathogenic prokaryotic organisms.
- Example : Cyanobacteria, Spirochaete, Firmicutes

(3) Eukarya domain :

- They are eukaryotes, cell wall is absent, if present made up of cellulose or fungus cellulose.
- The eukarya domain is divided into four kingdoms :

(1) Protista (2) Fungi (3) Animalia (4) Plantae

- (28) Who has given three-domain classifications ?
 (A) Whittaker (B) Linnaeus (C) Woese (D) Eichler
- (29) In which bacteria cell wall is not made up of peptidoglycan ?
 (A) Methanogens (B) Halophiles (C) Thermoacidophiles (D) A, B, C All
- (30) Which bacteria is responsible for the production of biogas ?
 (A) Cyanobacteria (B) Methanogens (C) Spirochaete (D) Halophiles
- (31) Which bacteria can live in extreme salty area ?
 (A) Spirochaete (B) Halophiles (C) Methanogens (D) Firmicutes

- (32) Which bacteria can survive in hot spring ?
 (A) Methanogens (B) Firmicutes (C) Thermoacidophiles (D) Halophiles
- (33) In which bacteria cell wall is made up of peptidoglycan ?
 (A) Cyanobacteria (B) Spirochaete (C) Firmicutes (D) A, B, C All
- (34) Which of following is photosynthesizing bacteria ?
 (A) Spirochaete (B) Firmicutes (C) Cyanobacteria (D) Halophiles
- (35) Which bacteria known as Gram positive and Gram negative bacteria respectively ?
 (A) Firmicutes - Spirochaete (B) Halophiles - Methanogens
 (C) Cyanobacteria - Spirochaete (D) Spirochaete - Firmicutes
- (36) Which are the simple, predominantly unicellular eukaryotic organisms ?
 (A) Protista (B) Euglenoids (C) Slime moulds (D) A, B, C All
- (37) Which unicellular or multicellular eukaryotes obtain nutrients by absorption ?
 (A) Sac - fungi (B) Club - fungi (C) Yeasts and moulds (D) A, B, C All
- (38) Which animals obtain nutrients primarily by ingestion ?
 (A) Worms (B) Insects (C) Sponges (D) A, B, C All
- (39) Which living organisms obtain nutrients by photosynthesis and absorption ?
 (A) Bryophytes (B) Pteridophytes (C) Conifers (Gymnosperms) (D) A, B, C All

Answers : (28-C), (29-D), (30-B), (31-B), (32-C), (33-D), (34-C), (35-A), (36-D), (37-D), (38-D), (39-D)

• **Viroids :**

- Viroids are discovered by Diener. Viroids are smaller than viruses. Viroid consists of a very simple structure and short RNA strand and capsid is absent.
- Viroids cause potato spindle tuber disease in potato and Alzheimers disease in human being.

- (40) Who discovered viroids ?
 (A) Invanowsky (B) Diener (C) Whittaker (D) Linnaeus
- (41) Which organisms are smaller than viruses ?
 (A) Viroids (B) Algae (C) Bacteria (D) Yeast
- (42) Which diseases occur by viroids in potato and human respectively ?
 (A) Tuber, Alzheimer's (B) Tobacco mosaic disease, Diabetes
 (C) Chlorosis, Alzheimer's (D) Alzheimer's, Tuber
- (43) Which organisms consists of a very simple structure, short RNA strand and absence of capsid ?
 (A) Viruses (B) Viroids (C) Bacteria (D) Fungi

Answers : (40-B), (41-A), (42-A), (43-B)

- **Viruses :**

- Pasteur gave name viruses, they are causative agents of infectious diseases.
- Inwanowsky discovered Tobacco Mosaic virus.
- Viruses are ultra-microscopic, crystalline, self reproducing and obligate parasite in living cells.
- Viruses are intermediate between living and non-living things hence they are called living chemical.
- Virus is living chemical which contains DNA or RNA as nucleoprotein. Surrounding the virus protective protein layer capsid is found which is made up of capsomere.
- Plant Viruses - TMV, BSV
- Animal Viruses - Polio viruses, Small pox viruses.
- Viruses that live on bacteria are known as bacteriophages.

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- (44) Who has given the name virus first ?
 (A) Inwanowsky (B) Diener (C) Pasteur (D) Woese
- (45) Who first time recognized that tobacco mosaic virus are causative organism for tobacco mosaic disease ?
 (A) Pasteur (B) Diener (C) Inwanowsky (D) Eichler
- (46) Who has discovered TMV ?
 (A) Diener (B) Inwanowsky (C) Pasteur (D) Linnaeus
- (47) Which organism can pass through bacteria proof filters ?
 (A) Viruses (B) Bacteria (C) Algae (D) Fungi
- (48) Which organism behaves as intermediate of living and non-living things ?
 (A) Bacteria (B) Viruses (C) Algae (D) Fungi
- (49) Which substance is present in Viral Capsid ?
 (A) Protein (B) Lipid (C) Carbohydrate (D) Nucleic acid
- (50) The organism which engulf bacteria is known as....
 (A) Virus (B) Bacteriophages (C) Viroids (D) A and C

Answers : (44-C), (45-C), (46-B), (47-A), (48-B), (49-A), (50-B)

- **Algae :**

- Algae is the first existing group of plants on the earth. The study of algae is called Algology or Phycology.
- Professor Iyengar is considered as the father of modern algology in India.
- Algae is found in fresh water, ocean or moist habitat. The plant body does not possess root, stem and leaves, So it is known as thallus.
- Algae are unicellular or multicellular, prokaryotic or eukaryotic, filamentous or colonial in form.

- Algae consists chlorophylls and other photosynthetic pigments, therefore algae are autotrophic in nutrition.
- They contain starch as reserve food material.
- Algae reproduce by vegetative, asexual and sexual method.
- Sex organs are naked, after fertilization zygote does not develop into embryo.
- Examples : Nostoc, Chlamydomonas, Spirogyra and volvox.

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- (51) Which is the first existing group of plants on the earth ?
 (A) Fungi (B) Algae (C) Lichen (D) Angiosperm
- (52) Who is considered as the father of modern algology in India ?
 (A) Linnaeus (B) Eichler (C) Professor Iyengar (D) Woese
- (53) Which is the example of Unicellular algae ?
 (A) Oscillatoria (B) Spirogyra (C) Nostoc (D) Chlamydomonas
- (54) Which plastid is included in photosynthetic pigments ?
 (A) Xanthophyll (B) Phycocynin (C) Phycoerythrin (D) A, B, C All
- (55) Which types of reproductive method is observed in algae ?
 (A) Fragmentation (B) By spores (C) By conjugation (D) A, B, C All
- (56) In algae storage of food occur in which form ?
 (A) Starch (B) Protein (C) Lipid (D) Nucleic acids
- (57) Which plant group possess thallus structure ?
 (A) Pteridophyta (B) Angiosperms (C) Algae (D) Gymnosperms

Answers : (51-B), (52-C), (53-D), (54-D), (55-D), (56-A), (57-C)

- **Fungi :**
 - The study of fungi is called Mycology. Fungi show cosmopolitan distribution.
 - The plant body is called mycelium. Cell wall is made up of fungus-cellulose (chitin). Chlorophyll is absent so Fungi cannot prepare its own food material.
 - It is heterotroph or saprophyte. Reserved food is stored as Glycogen and fat droplet form.
 - Fungi reproduce by vegetative, asexual and sexual method.
 - Sexual reproduction may be isogamous, heterogamous or oogamous type.
 - Sexual reproduction take place in three phase : (1) Plasmogamy (2) Karyogamy (3) Meiosis
 - Examples : Yeast, Mucor, Agaricus, Penicillium

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- (58) The plant body of fungi is called as
 (A) Herbs (B) Mycelium (C) Shrubs (D) Tree
- (59) In which form is reserve food material present in fungi ?
 (A) Glycogen (B) Animal starch (C) Fat droplets (D) A, C

- (60) In fungi how many types of sexual reproduction takes place ?
 (A) One (B) Two (C) Three (D) Four
- (61) On the basis of nutrition fungi is included in which group ?
 (A) Autotrophic (B) Heterotrophic
 (C) Saprophytes (D) B and C
- (62) Which fungi is used as antibiotics ?
 (A) Yeast (B) Mucor (C) Penicillium (D) Mushroom
- (63) Which types of spores occurs in fungi ?
 (A) Zoospores (B) Aplanospores (C) Pycnidiospores (D) A and B
- (64) Which plant is achlorophyllous and unicellular ?
 (A) Chlamydomonas (B) Yeast (C) Mould (D) Penicillium

Answers : (58-B), (59-D), (60-C), (61-D), (62-C), (63-D), (64-B)

• **Lichen :**

- The study of lichen is called lichenology. It is symbiosis of algae and fungi.
- Lichen discovered by Tulsane.
- The algal component is called phycobiont and fungal component is called mycobiont.
- Fungi absorb water and mineral nutrients from environment and provides to algae and algae synthesize food by photosynthesis.
- Lichens reproduce asexually and sexually. The fruiting body produce sex organ.
- The fruiting bodies of lichens are called apothecium or perithecium.
- On the basis of external form lichens are of three types : (1) Crustose lichen (2) Foliose lichen (3) Fruticose lichen
- Examples : Strigula, Parmelia, Usnea.

- (65) Who discovered lichen ?
 (A) Professor Iyengar (B) Tulsane (C) Shiv Ram Kashyap (D) Eichler
- (66) In lichen algae and fungi structure respectively called as
 (A) Mycobiont, Phycobiont (B) Apothecium, Perithecium
 (C) Phycobiont, Mycobiont (D) Oidiospores, Pycnidiospores
- (67) Asexually lichen reproduce by which spores ?
 (A) Oidiospores (B) Pycnidiospores (C) Aplanospores (D) A and B
- (68) How many types are there of lichen on the basis of external structure ?
 (A) One (B) Two (C) Three (D) Four
- (69) Which type of shape is found in fruiting body of lichen ?
 (A) Cup shaped (B) Flask shaped (C) Round shaped (D) A and B

- (70) Which of the following is odd for lichen ?
 (A) Crustose lichens (B) Foliose lichens (C) Fruticose lichens (D) Gemmae
- (71) The example of lichen is
 (A) Strigula (B) Parmelia (C) Usnea (D) A, B, C All

Answers : (65-B), (66-C), (67-D), (68-C), (69-D), (70-D), (71-D)

• **Bryophytes :**

- These plants occupy a position between algae and pteridophyta.
- Professor Shiv Ram Kashyap is considered as the father of Indian bryology.
- It is autotrophic as it contains chlorophyll.
- Botanist Rothmelaar has divided the bryophytes into three classes : (1) Hepaticopsida (2) Anthocerotopsida (3) Bryopsida.
- Bryophytes lack vascular tissue, their fertilization occur only in water. After fertilization embryo is not formed.
- The life cycle of bryophytes has two distinct phase (1) Gametophytic (2) Sporophytic; alternating with each other is called alternation of generation.
- Example : Riccia, Anthoceros, Marchantia, Funaria.

- (72) Which plants occupy position between algae and pteridophyta ?
 (A) Algae (B) Bryophytes (C) Angiosperms (D) Gymnosperms
- (73) Who classified bryophytes into Hepaticopsida, Anthocerotopsida and Bryopsida ?
 (A) Professor Shiv Ram (B) Tulsane (C) Rothmelaar (D) Iyengar
- (74) In which plant group vascular tissues are absent ?
 (A) Bryophyta (B) Pteridophyta (C) Gymnosperms (D) Angiosperms
- (75) In which plants fertilization occurs only in water ?
 (A) Riccia (B) Funaria (C) Anthoceros (D) A, B, C All
- (76) In which plant group gametophytic stage is main and sporophytic phase is subsidiary ?
 (A) Pteridophyta (B) Gymnosperms (C) Bryophyta (D) Angiosperms
- (77) In which plant group gametophytic plant body is either thalloid or erect ?
 (A) Funaria (B) Selaginella (C) Araucaria (D) Morpichh
- (78) Which type of reproductive method is observed in anthoceros ?
 (A) Fragmentation (B) Gemmae (C) Sexual reproduction (D) A, B, C All

Answers : (72-B), (73-C), (74-A), (75-D), (76-C), (77-A), (78-D)

- **Pteridophytes :**

- They were the first land plants on the earth. They are usually terrestrial and grow in moist or shady habitat.
- They consist root, stem and leaves with well developed vascular tissue.
- Zygote undergoes divisions to form embryo.
- The sporophylls are of two types : (1) Homophyllous (2) Heterophyllous
- The pteridophyte shows alternation of generation.
- Example : Nephrolepis, Equisetum, Selaginella, Rhynia (Fossil)

- (79) Which are the first land plants on the earth ?
 (A) Pteridophytes (B) Bryophytes (C) Monocot (D) Dicot
- (80) In which plant group first vascular tissue is observed ?
 (A) Bryophytes (B) Pteridophytes (C) Gymnosperms (D) Angiosperms
- (81) From where the spores are produced in pteridophytes ?
 (A) Sporangia (B) Microspores (C) Megaspores (D) A, B, C All
- (82) Which are the fossil pteridophyte plant ?
 (A) Bennettites (B) Rhynia (C) Nephrolepis (D) Selaginella
- (83) Which stage is responsible for sexual reproduction in pteridophyta ?
 (A) Gametophyte (B) Sporophyte (C) Vegetative (D) A and B

Answers : (79-A), (80-B), (81-A), (82-B), (83-A)

- **Gymnosperms :**

- Gymnosperms vary in size from small plants to very large gigantic plants.
- The tallest tree is Sequoia, about 150 meters in height. While *zamia pygmea* is smallest gymnosperm having tuberous stem.
- Gymnosperm possess two type of leaves : (1) Foliage leaves (2) Scaly leaves
- They are evergreen, perennial, xerophytic plant which possess vascular tissue.
- They show alternation of generation.
- Sporophylls are arranged on central axis in the form of cones. Cones are unisexual and gymnosperms are heterosporous.
- Example : Cycus, Pinus, Araucaria, Bennettites (Fossil plant), Thuja (Morpichh).

- (84) Which plant show air pollination, pre-fertilization and single fertilization ?
 (A) Gymnosperms (B) Monocot (C) Angiosperms (D) Dicot
- (85) In which plant ovule are orthotropous and lacks the fruit ?
 (A) Pinus (B) Cycus (C) Morpichh (D) A, B, C All
- (86) In which plant ovules are naked ?
 (A) Angiosperm (B) Gymnosperm (C) Monocot (D) Dicot

- (87) Which plant is tallest in the world ?
 (A) *Zamia pygmea* (B) Agave (C) Sequoia (D) Rafflesia
- (88) Which of following plant is smallest gymnosperms having an underground tuberous stem ?
 (A) Pinus (B) *Zamia pygmea* (C) *Cycus* (D) Sequoia
- (89) Which is the fossil gymnosperm ?
 (A) Pinus (B) Bennettites (C) *Cycus* (D) Morpichh
- (90) The characters of gymnosperm is
 (A) Hydrophytes (B) Mesophytes (C) Halophytes (D) Xerophytes
- (91) How many types of leaves are there in Gymnosperms ?
 (A) One (B) Two (C) Three (D) Four

Answers : (84-A), (85-D), (86-B), (87-C), (88-B), (89-B), (90-D), (91-B)

• **Angiosperm :**

- Angiosperms, are most dominant and biggest plant group all over world.
- Plant species of angiosperms vary in size i.e. smallest plant is *Wolffia globosa* which is 2-5 mm in size where as largest plant is *Eucalyptus sp.* with a height of about 90 to 100 meters in Australia.
- *Rafflesia arnoldi* possesses the largest flower with a weight of about 8 kg and diameter about 1 mt. *Agave sp.* consists largest inflorescence of about 6 mt height.
- Sporophytic plant body is in the form of herbs. Shrubs, trees, climbers or lianas. Vascular tissue are well developed and ovules are enclosed in the ovary.
- Flowers are unisexual or bisexual. They include two accessory whorls (calyx and corolla) and two necessary whoris (Androeium and Gynoecium).
- Pollination takes place through air, insects and birds. Angiosperm shows double and post fertilization.
- The life cycle shows alternation of generation. After fertilization ovules are transformed into seed and ovary into fruit.

- (92) Which group of plants represent maximum species and occupies first position on earth ?
 (A) Angiosperm (B) Gymnosperm (C) Bryophyte (D) Pteridophyte
- (93) Which characters are observed in angiosperm ?
 (A) Hydrophytic (B) Xerophytic (C) Mesophytic (D) A, B, C All
- (94) Which is the smallest and largest angiosperm plant ?
 (A) *Wolffia globosa*, *Zamia Pygmea* (B) Eucalyptus, Sequoia
 (C) *Wolffia globosa*, Eucalyptus (D) A and B
- (95) What is the size of *Wolffia globosa* ?
 (A) 2 - 5 mm (B) 1 - 2 mm (C) 5 - 10 mm (D) 3 - 4 mm
- (96) What is the height of largest inflorescence of *Agave sp* ?
 (A) About 6 meters (B) 5 meters (C) 4 meters (D) 8 meters

- (97) What is weight of *Rafflesia arnoldii* ?
 (A) 8 Kg (B) 7 Kg (C) 6 Kg (D) 5 Kg
- (98) Pollination takes place through which in Angiosperm ?
 (A) Air (B) Insects (C) Birds (D) A, B, C All

Answers : (92-A), (93-D), (94-C), (95-A), (96-A), (97-A), (98-D)

• **Bentham and Hooker's classification :**

- Bentham and Hooker classified the angiosperms into two classes (1) Dicotyledon (2) Monocotyledon.

• **Dicotyledon :**

- Embryo possesses two cotyledons. Flowers are pentamerous and leaves show reticulate venation. Example : Sunflower
- Class dicotyledon is divided into three sub classes.

(1) Polypetalae : Petals are free in flower. It includes three series :

(a) Thalamiflorae (b) Disciflorae (c) Calyciflorae

(2) Gamopetalae : Petals are fused in the flower. It includes three series.

(a) Inferae (b) Heteromerae (c) Bicarpellatae

(3) Monochlamydeae : Flower possess one whorl of perianth. It has no order but includes 8 series.

• **Monocotyledon :**

- Embryo possesses single cotyledon. Leaves show parallel venation. Flower are trimerous. Example : Maize
- This class does not include any order but it is divided into 7 series. Example : *Alium cepa*
local name : Onion

- (99) Whose classification is used by most of the well known herbaria of the world ?
 (A) Eichler (B) Bentham and Hooker (C) Linnaeus (D) R. H. Whittaker
- (100) Thalamiflorae, disciflorae and calyciflorae respectively possess how many orders ?
 (A) 6, 4, 5 (B) 3, 3, 4 (C) 5, 4, 6 (D) 6, 5, 4
- (101) How many orders are there in inferae, heteromerae and bicarpellatae respectively ?
 (A) 4, 3, 2 (B) 3, 3, 4 (C) 6, 4, 5 (D) 6, 5, 4
- (102) *Catharanthus roseus* is name of which plant ?
 (A) Rose (B) Hibiscus (C) Barmasi (D) Boganvel
- (103) Boganvel is included in series
 (A) Polypetalae (B) Gamopetalae (C) Monochlamydeae (D) A and B
- (104) Which plant has no order ?
 (A) Onion (B) Boganvel (C) Maize (D) A, B, C All
- (105) *Hibiscus rosa sinensis* is scientific name of
 (A) Rose (B) Sunflower (C) Shoe-flower (D) Lemon

Answers : (99-B), (100-A), (101-B), (102-C), (103-C), (104-D), (105-C)

- **Plant life cycle and alternation of generation :**

- The life cycle of plant shows two phases : (1) Gametophytic (2) Sporophytic alternating with each other is known as alternation of generation.
- The different plant groups shows their alternation of generation into three patterns :
 - (1) Haplontic life cycle : Example : Volvox and Spirogyra
 - (2) Diplontic life cycle : Example : Gymnosperms, Angiosperms and exceptionally fucus alga.
 - (3) Haplo-diplontic life cycle : Example : Ectocarpus and other sea weeds.

- (106) How many patterns of different plant groups show their alternation of generations ?
 (A) One (B) Two (C) Three (D) Four
- (107) Which plant shows haplontic life cycle ?
 (A) Fucus (B) Ectocarpus (C) Volvox (D) Nostoc
- (108) Diplontic life cycle occurs in
 (A) Gymnosperm (B) Angiosperm (C) Fucus-algae (D) A, B, C All
- (109) Which type of life cycle Spirogyra shows ?
 (A) Haplontic (B) Diplontic (C) Haplo-Diplontic (D) Triplontic
- (110) In which plants haplo-diplontic life cycle occurs ?
 (A) Bryophyte (B) Pteridophyte (C) Ectocarpus (D) A, B, C All
- (111) Naked and orthotropous ovules occur in which plant ?
 (A) Pinus (B) Maize (C) Sunflower (D) Agave
- (112) Which of following is not included in gynoecium ?
 (A) Stigma (B) Connective (C) Style (D) Ovary
- (113) How many necessary whorls are there in typical flower ?
 (A) One (B) Two (C) Three (D) Four

Answers : (106-C), (107-C), (108-D), (109-A), (110-D), (111-A), (112-B), (113-B)

- **True-False (T - F) types questions :**

Select true or false option in following sentences.

- (114) (1) Volvox and spirogyra shows haplontic life cycle.
 (2) Fucus algae shows diplontic life cycle.
 (3) Ectocarpus shows Haplo-diplontic life cycle.
 (4) Gametophytic phase is main in pteridophyte.
 (5) Sporophytic phase is main in bryophytes.

(A) T, T, T, F, F (B) T, F, T, F, T (C) T, T, F, T, T (D) F, F, T, T, T

- (115) (1) Smallest angiospermic plant is *Wolffia*.
 (2) The size of *Wolffia* is 5-10 mm.
 (3) The largest angiosperm occurs in Australia.
 (4) *Zamia pygmaea* having an underground tuberous stem.
 (5) Gymnosperm plants have xerophytic characters.
 (A) T, T, F, F, T (B) T, F, T, T, T (C) F, T, F, F, T (D) F, T, T, F, T
- (116) (1) Pteridophyte possess two type of sporophylls.
 (2) Angiosperm shows double fertilization.
 (3) In Gymnosperm pollination occurs by insects.
 (4) In Bryophytes fertilization occurs by air.
 (5) Algae is endospermic plant.
 (A) F, T, F, T, F (B) T, F, T, F, T (C) T, T, F, F, F (D) F, F, T, F, T
- (117) (1) Bennettites is fossil pteridophytes.
 (2) Rhynia is fossil bryophytes.
 (3) Bryophytes lack vascular tissue.
 (4) Fungal component of lichen is called phycobiont.
 (5) In fungus sexual reproduction takes place in two phases.
 (A) F, F, T, F, T (B) T, T, T, F, F (C) T, T, F, T, T (D) F, T, F, T, F
- (118) (1) Fungi stores food in glycogen form.
 (2) Algae stores food in starch form.
 (3) Viroids cannot cause disease in plants.
 (4) Viruses are discovered by Ivanowsky.
 (5) Algae is the first existing group of plants on the earth.
 (A) T, T, F, T, T (B) F, T, F, T, F (C) F, F, T, F, F (D) T, T, T, F, T
- (119) (1) Eichler has classified the plant kingdom into two main groups.
 (2) The three domain classification system was given by Woese.
 (3) A five kingdom classification system was given by Whittaker.
 (4) Shiv Ram Kashyap is considered as the father of algology.
 (5) Rothmaler is considered as the father of bryophytes.
 (A) F, F, T, F, F (B) T, F, T, F, T (C) T, T, T, F, F (D) T, T, F, F, T

Answers : (114-A), (115-B), (116-C), (117-A), (118-A), (119-C)

• **A - Assertion and R - Reason type questions :**

Which option is correct for given question ?

(A) A and R both are true and R is correct explanation of the A.

(B) A and R both are true and R is not correct explanation of the A.

(C) A is true and R is false.

(D) A is false and R is true.

(120) Assertion A : The first formed life is known as protista.

Reason R : They are of various forms on the basis of their development.

(A) (B) (C) (D)

(121) Assertion A : Cyanobacteria possess rigid cell wall, lacks membrane bound organelles and nucleoprotein as genetic material.

Reason R : Cyanobacteria are included in kingdom monera.

(A) (B) (C) (D)

(122) Assertion A : Methanogens lived in extreme condition.

Reason R : Methanogens are included in Archaea domain.

(A) (B) (C) (D)

(123) Assertion A : Viruses are intermediate of living and non-living.

Reason R : Viruses can pass through bacteria-proof filters.

(A) (B) (C) (D)

(124) Assertion A : Algae possess plastids and various photosynthetic pigments.

Reason R : In algae after fertilization, zygote develops into embryo.

(A) (B) (C) (D)

(125) Assertion A : Lichens is a symbiotic structure of algae and fungi.

Reason R : The fruiting body of lichen is called apothecium or perithecium.

(A) (B) (C) (D)

(126) Assertion A : The bryophyte and pteridophyte plants grow in shady habitat.

Reason R : In bryophyte and pteridophyte after fertilization zygote develops into embryo.

(A) (B) (C) (D)

(127) Assertion A : The height of sequoia is about 150 meters.

Reason R : The agave sp. consists of about 6 meter hight.

(A) (B) (C) (D)

(128) Assertion A : Polypetalae are not classified on the basis of thalamus.

Reason R : Gamopetalae are not classified on the basis of ovary.

(A) (B) (C) (D)

Answers : (120-C), (121-A), (122-A), (123-B), (124-C), (125-B), (126-B), (127-C), (128-D)

(129) Select correct option :

Column - I

Column - II

- | | | |
|------------------|--|------------------------------------|
| (a) Eichler | (i) Five kingdom classification | (A) a - iv, b - iii, c - ii, d - i |
| (b) Linnaeus | (ii) Father of Botany | (B) a - ii, b - iv, c - i, d - iii |
| (c) Theophrastus | (iii) Father of classification | (C) a - iv, b - iii, c - i, d - ii |
| (d) Whittaker | (iv) Plant kingdom classified into two group | (D) a - iii, b - iv, c - i, d - ii |

(130) Select correct option :

Column - I

Column - II

- | | | |
|-----------------|---------------------|------------------------------------|
| (a) Phycobiont | (i) Haplo-diplontic | (A) a - ii, b - i, c - iv, d - iii |
| (b) Strigula | (ii) Cup-shaped | (B) a - iii, b - iv, c - ii, d - i |
| (c) Apothecium | (iii) Algae | (C) a - ii, b - iii, c - iv, d - i |
| (d) Perithecium | (iv) Lichens | (D) a - iv, b - i, c - ii, d - iii |

(131) Select correct option :

Column - I

Column - II

- | | | |
|---------------|----------------------------------|------------------------------------|
| (a) Wolffia | (i) 1 meter diameter | (A) a - ii, b - iii, c - iv, d - i |
| (b) Rafflesia | (ii) 150 meter height | (B) a - iii, b - iv, c - i, d - ii |
| (c) Sequoia | (iii) 6 meter high inflorescence | (C) a - iv, b - iii, c - i, d - ii |
| (d) Agave | (iv) 2 - 5 mm | (D) a - iv, b - i, c - ii, d - iii |

(132) Select correct option :

Column - I

Column - II

- | | | |
|-------------------|-----------------------------|------------------------------------|
| (a) TMV | (i) Human | (A) a - iv, b - i, c - ii, d - iii |
| (b) Alzheimer's | (ii) Potato | (B) a - iii, b - iv, c - i, d - ii |
| (c) Spindle tuber | (iii) Animal viruses | (C) a - ii, b - iii, c - iv, d - i |
| (d) Polio virus | (iv) Tobacco mosaic viruses | (D) a - iv, b - ii, c - i, d - iii |

(133) Select correct option :

Column - I

Column - II

- | | | |
|-------------------|---------------|------------------------------------|
| (a) Thalamiflorae | (i) 5 order | (A) a - iv, b - iii, c - ii, d - i |
| (b) Disciflorae | (ii) 3 order | (B) a - ii, b - iii, c - iv, d - i |
| (c) Heteromerae | (iii) 4 order | (C) a - iii, b - iv, c - ii, d - i |
| (d) Calyciflorae | (iv) 6 order | (D) a - iv, b - i, c - ii, d - iii |

(134) Select correct option :

Column - I

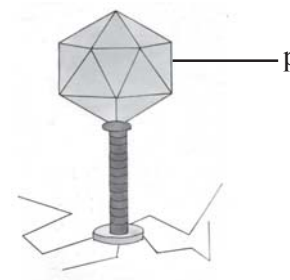
Column - II

- | | | |
|----------------------|----------------------|------------------------------------|
| (a) Blue green algae | (i) Spirogyra | (A) a - iv, b - iii, c - ii, d - i |
| (b) Red algae | (ii) Sargassum | (B) a - ii, b - iii, c - iv, d - i |
| (c) Brown algae | (iii) Batracospermum | (C) a - iii, b - iv, c - ii, d - i |
| (d) Green algae | (iv) Nostoc | (D) a - iv, b - i, c - ii, d - iii |

Answers : (129-A), (130-B), (131-D), (132-A), (133-A), (134-A)

(135) In given figure 'p' indicates

- (A) Head (B) Capsid
(C) Filaments (D) Tail



(136) In given diagram 'p' indicate which plant ?



- (A) Nephrolepis (B) Selaginella
(C) Equisetum (D) Zamia

(137) In given diagram, plant belongs to group

- (A) Bryophytes (B) Pteridophytes
(C) Gymnosperm (D) Angiosperm



(138) In given diagram the storage of food occur in which form ?



- (A) Starch (B) Cellulose
(C) Glycogen (D) Chitin

(139) Which plant is shown in given diagram ?

- (A) Wolffia (B) Rafflesia
(C) Cycus (D) Pinus



(140) Select the scientific name of plant of given diagram.



- (A) *Hibiscus rosa-Sinensis*
(B) *Rosa-indica*
(C) *Helianthus annuus*
(D) *Catharanthus roseus*

Answers : (135-A), (136-B), (137-A), (138-C), (139-B), (140-C)

• **Questions for NEET :**

(141) The locomotion of male gamete of bryophyte and pteridophyte towards female gamete is known as...

- (A) Chemotaxis (B) Phototaxis (C) Phototropism (D) Hydrotropism

(142) Which fungi is used as food ?

- (A) Mucor (B) Agaricus (C) Penicillium (D) Rizopus

(143) Pteridophyte plant differ from bryophyte on which basis ?

- (A) Zoospores (B) Vascular tissue (C) Aplanospores (D) Male reproductive organ

(144) What is the specific character of bryophyte ?

- (A) Absence of vascular tissue (B) Absence of Root
(C) To produce spore (D) Alternation of generation

- (145) Which types of lifecycle occurs in spirogyra ?
 (A) Diplontic (B) Haplo-diplontic (C) Haplontic (D) A and B
- (146) Which of following plant possesses seeds but fruits are absent ?
 (A) Selaginella (B) Araucaria (C) Maize (D) Sunflower
- (147) Who has discovered viruses ?
 (A) Diener (B) Pasteur (C) Invanowsky (D) Iyengar
- (148) What is bacteriophage ?
 (A) Animal virus (B) Virus lived on bacteria
 (C) Plant virus (D) Halophiles
- (149) Which organism lived in extreme condition ?
 (A) Archaeobacteria (B) Eubacteria
 (C) Cyanobacteria (D) Gram positive bacteria
- (150) Which disease is caused by viruses ?
 (A) Polio (B) Diphtheria (C) Cold (D) T.B.
- (151) The five kingdom classification system given by whittaker is based on which criteria ?
 (A) Cell structure (B) Nucleus (C) Types of nutrition (D) A, C
- (152) Whittaker put prokaryotes into
 (A) Protista (B) Plant kingdom (C) Fungi (D) Monera
- (153) Who gave word Bryophyta ?
 (A) Shiv Ram Kashyap (B) Linnaeus (C) Iyengar (D) Tulsane
- (154) Which pigment is present in green algae ?
 (A) Xanthophyll (B) Carotenoid (C) Fucoxanthin (D) Chlorophyll a and b
- (155) Which plant is included in series calyciflorae ?
 (A) Shoe-flower (B) Rose (C) Lemon (D) Maize

Answers : (141-A), (142-B), (143-B), (144-A), (145-C), (146-B), (147-C), (148-B), (149-A), (150-A), (151-D), (152-D), (153-A), (154-D), (155-B)
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Classification Theory

