

**SOLVED EXAMPLE**

**Ex.1** Fusion of two motile gametes which are dissimilar in size is termed as

- (A) oogamy (B) isogamy  
(C) anisogamy (D) zoogamy.

**Sol.** (C) : Anisogamy is fusion of two motile gametes dissimilar in size. It is observed in some species of Chlamydomonas. Oogamy is also fusion of two dissimilar sized gametes in which female gamete is larger but non-motile.

**Ex.2** Cyanobacteria are classified under

- (A) Protista (B) Plantae  
(C) Monera (D) Algae.

**Sol.** (C) : Cyanobacteria are classified under Kingdom Monera as they are prokaryotes. They are generally photosynthetic in nature and contain pigments, chlorophyll a, and carotenoids, etc. Nostoc and Oscillatoria are examples of this category.

**Ex.3** If the diploid number of a flowering plant is 36, what would be the chromosome number in its endosperm?

- (A) 36 (B) 18  
(C) 54 (D) 72

**Sol.** (C) : Endosperm of flowering plants is a triploid structure. As  $2n = 36$ , then  $n = 18$ , therefore  $3n = 54$ .

**Ex.4** A plant shows thallus level of organisation. It shows rhizoids and is haploid. It needs water to complete its life cycle because the male gametes are motile. It may belong to

- (A) pteridophytes (B) gymnosperms  
(C) monocots (D) bryophytes.

**Sol.** (D) : Bryophytes are non-vascular terrestrial plants of moist habitat in which a multicellular diploid sporophyte lives as a parasite on an independent multicellular haploid gametophyte that develops multi-cellular jacketed sex organs. True roots are absent, instead rhizoids occur, which may be unicellular or multicellular. An external layer of water is essential for the swimming of male gametes to the archegonia.

**Ex.5** Plants of this group are diploid and well adapted to extreme conditions. They grow bearing sporophylls in compact structures called cones. The group in reference is

- (A) monocots (B) dicots  
(C) pteridophytes (D) gymnosperms.

**Sol.** (D) : Gymnosperms are those seed plants in which the seeds remain exposed over the surface of the megasporophylls because the latter are not folded to form pistils. Flowers are absent. Two types of sporophylls, microsporophylls and megasporophylls are usually aggregated to form distinct cones or strobili, pollen cones (male cones) and seed cones (female cones) respectively.

**Ex.6** The embryo sac of an angiosperm is made up of

- (A) 8 cells (B) 7 cells and 8 nuclei  
(C) 8 nuclei (D) 7 cells and 7 nuclei.

**Sol.** (B) : Female gametophyte or embryo sac of angiosperms develops upto 8-nucleate, 7-celled state prior to fertilisation. There is a three-celled apparatus (one egg cell or oosphere and two synergids), three antipodal cells and two polar nuclei. The two polar nuclei fuse to form a diploid secondary nucleus.

**Ex.7** Protonema is

- (A) haploid and is found in mosses  
(B) diploid and is found in liverworts  
(C) diploid and is found in pteridophytes  
(D) haploid and is found in pteridophytes.

**Sol.** (A) : The predominant stage in the life cycle of a moss (bryophyte) is the gametophyte which consists of two stages. The first stage is the protonema stage, which develops directly from a spore. It is a creeping, green, branched and frequently filamentous stage. The second stage is the leafy stage, which develops from the secondary protonema as a lateral bud. It consists of upright, slender axes bearing spirally arranged leaves attached to the soil through multicellular and branched rhizoids. This stage bears the sex organs.

**Ex.8** Holdfast, stipe and frond constitute the plant body in case of

- (A) Rhodophyceae (B) Chlorophyceae  
(C) Phaeophyceae (D) all of these.

**Sol.** (C) : Phaeophyceae (Brown algae) are eukaryotic marine algae. The body consists of branched filamentous structure in lower forms (e.g. Ectocarpus) and parenchymatous structure in higher forms (e.g. Sargassum). The plant body is often differentiated into holdfast, stipe and lamina (frond). Lamina may be simple or divided variously and is photosynthetic.

**Ex.9** The giant Redwood tree (*Sequoia sempervirens*) is a tree  
 (A) angiosperm (B) free fern  
 (C) pteridophyte (D) gymnosperm.

**Sol.** (D) : *Sequoia sempervirens* is a gymnosperm. It is the sole living species of genus *Sequoia*. Its common names include coast redwood, California redwood. It is an evergreen, long living monoecious tree.

**Ex.10** A prothallus is  
 (A) a structure in pteridophytes formed before the thallus develops  
 (B) a sporophytic free living structure formed in pteridophytes  
 (C) a gametophyte free living structure formed in pteridophytes  
 (D) a primitive structure formed after fertilisation in pteridophytes.

**Sol.** (C) : Prothallus is a small, flattened multicellular structure that represents the independent gametophyte generation in pteridophytes, e.g., club mosses, horsetails and ferns. In some of the pteridophytes a single prothallus bears both male and female sex organs. In others there are separate male and female prothalli.

**Ex.11** An alga which can be employed as food for human being is  
 (A) *Chlorella* (B) *Spirogyra*  
 (C) *Oscillatoria* (D) *Ulothrix*

**Sol.** (A) : *Chlorella vulgaris* : This is the source of protein. This is rounded unicellular algae related to class chlorophyceae.

**Ex.12** Consider the following statements regarding gymnosperms and choose the correct option

- (A) In gymnosperms, the male and female gametophytes have an independent existence
- (B) The multicellular female gametophyte is retained within the megasporangium
- (C) The gymnosperms are heterosporous of these statements
- (A) (A) and (B) are true but (C) is false
- (B) (A) and (C) are true but (B) is false
- (C) (B) and (C) are true but (A) is false
- (D) (A) and (C) are true but (B) is false
- (E) (B) and (C) are true but (A) is false

**Sol.** (E)

**Ex.13** Bryophytes comprise  
 (A) Sporophyte is of longer duration  
 (B) Dominant phase of sporophyte which is parasitic  
 (C) Dominant phase of gametophyte which produces spores  
 (D) Small sporophyte phase and generally parasitic on gametophyte

**Sol.** (D) : In Bryophyta, sporophyte is never independent but it is parasitic over gametophytic plant either partially for water and mineral supply or wholly for organic food.

**Ex.14** Match the following with correct combination

Column - I	Column - II
A. Anthoceros	1. Walking fern
B. <i>Andianthum</i>	2. Alga
C. <i>Sargassum</i>	3. Invertebrate
D. Asterales	4. Gametophyte
	5. Hornwort
	6. Liverwort

- (A) A - 6, B - 5, C - 1, D - 3
- (B) A - 5, B - 4, C - 3, D - 2
- (C) A - 5, B - 1, C - 2, D - 4
- (D) A - 3, B - 2, C - 1, D - 5
- (E) A - 1, B - 4, C - 3, D - 5

**Sol.** (C)

## BIOLOGY FOR NEET & AIMS

**Ex.15** Alginic acid is obtained from  
(A) Red algae (B) Green algae  
(C) Diatoms (D) Brown algae

**Sol.** (D) : Alginic acid is a non sulphated phycocolloid extracted from middle lamella/cell walls of Laminaria, Lessonia, Fucus etc.

**Ex.16** Meiotic division in zygote takes place in  
(A) Thallophyta (B) Angiosperms  
(C) Gymnosperms (D) Pteridophyta

**Sol.** (A)

**Ex.17** Monoecious plant of Chara shows occurrences of  
(A) Upper oogonium and lower oogonium on the same plant  
(B) Antheridiophore and archegoniophore on the same plant  
(C) Stamen and carpel on the same plant  
(D) Upper antheridium and lower oogonium on the same plant

**Sol.** (A)

**Ex.18** Mannitol (sugar alcohol) is the stored food in  
(A) Chara (B) Porphyra  
(C) Fucus (D) Gracillaria.

**Sol.** (C)

**Ex.19** If you are asked to classify the various algae into distinct groups, which of the following characters you should choose  
(A) Types of pigments present in the cell  
(B) Nature of stored food materials in the cell  
(C) Structural organisation of thallus  
(D) Chemical composition of the cell wall

**Sol.** (A) : Different type of colour in Algae are due to different pigmentations and it provides a strong base to classify the Algae.

**Ex.20** Select the wrong statement  
(A) Chlamydomonas exhibits both isogamy and anisogamy and Fucus shows oogamy  
(B) Isogametes are similar in structure, function and behaviour  
(C) Anisogametes differ either in structure, function or behaviour  
(D) In Oomycetes female gamete is smaller and motile, while male gamete is larger and non-motile

**Sol.** (D)

**Ex.21** Elaters are present in sporogonium of  
(A) Riccia (B) Marchantia  
(C) Selaginella (D) Sphagnum

**Sol.** (B) : The sporogonium of Marchantia is differentiated into foot, seta and capsule. Capsule contains elaters (2n). Elaters are diploid, spindle shaped hygroscopic elongated structures with 2 spiral bands.

**Ex.22** Which one of the following is absent in sporophyte of Funaria

(A) Foot (B) Seta  
(C) Elaters (D) Columella

**Sol.** (C) : Foot, seta and central sterile portion of theca is called columella found in Funaria. Elaters are absent in Funaria, Sphagnum, Polytrichum, Riccia, etc. They are the characteristic features of Marchantia, Pellia, Porella, etc.

**Ex.23** Largest gametophyte is found in  
(A) Funaria (B) Selaginella  
(C) Pinus (D) Cycas

**Sol.** (A)

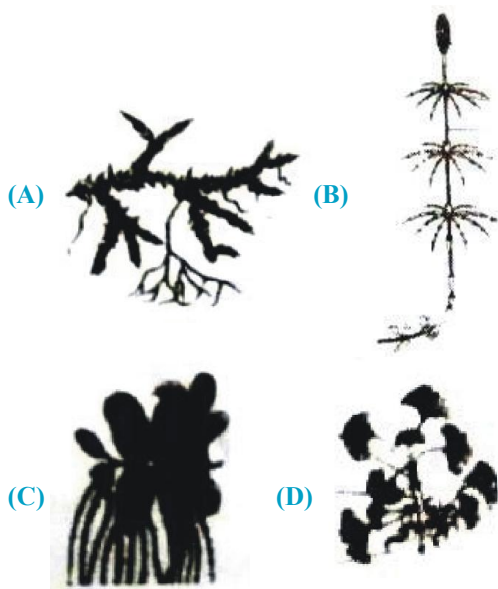
**Ex.24** Which one of the following belongs to vascular cryptogams  
(A) Bryophyta (B) Pteridophyta  
(C) Gymnosperm (D) Angiosperms

**Sol.** (B) : Pteridophytes are also known as 'Vascular cryptogams'. The term 'Cryptogams' is made of 2 Greek word, i.e., Kryptose, hidden + gamous, wedded, i.e., these are the plants which reproduce by means of spores and do not produce seeds.

**Ex.25** Fern stele is  
(A) Dictyostele (B) Siphonostele  
(C) Protostele (D) None of these

**Sol.** (A) : Dictyostele : A siphonostele performed by several overlapping leaf gaps. Each separate strand is called meristele. e.g., Dryopteris, Pteridium, Pteris etc.

**Ex.26** Examine the figures A, B, C and D. In which one of the four options all the items A, B, C and D are correct



**Options :**

- |            | <b>A</b>    | <b>B</b>   | <b>C</b>    | <b>D</b>  |
|------------|-------------|------------|-------------|-----------|
| <b>(A)</b> | Chara       | Marchantia | Fucus       | Pinus     |
| <b>(B)</b> | Equisetum   | Ginko      | Selaginella | ycopodium |
| <b>(C)</b> | Selaginella | Equisetum  | Salvinia    | Ginko     |
| <b>(D)</b> | Funaria     | Adiantum   | Salvinia    | Riccia    |

**Sol.** (C)

**Ex.27** Selaginella and Salvinia are considered to represent a significant step towards evolution of seed habit because

- (A)** Megaspores possess endosperm and embryo surrounding by seed coat
- (B)** Embryo develops in female gametophyte which is retained on parent sporophyte
- (C)** Female gametophyte is free and gets dispersed like seeds
- (D)** Female gametophyte lacks archegonia

**Sol.** (B)

**Ex.28** The archegonia of Funaria is distinguished from that of Pinus by the structure of

- (A)** Long neck
- (B)** Several neck canal cells
- (C)** Stalked venter
- (D)** All of the above

**Sol.** (D)

**Ex.29** When and where does reduction division take place in the life cycle of a liverwort, a moss, a fern, a gymnosperm and an angiosperm?

**Sol.** **Liverwort** – In liverworts, the main plant-body is haploid (gametophytic). It bears the male and female sex organs which produce gametes. These gametes fuse to form a zygote. The zygote develops on the gametophytic plant-body to form a sporophyte. The sporophyte is differentiated into the foot, seta, and capsule. Many haploid spores are produced as a result of the reduction division taking place inside the capsule.

**Moss** – In mosses, the primary protonema (developed in the first stage) develops into the secondary protonema. Both these stages are haploid or gametophytic. The secondary protonema bears the sex organs which produce gametes. These gametes fuse to form a zygote. The zygote develops into a sporophyte. Many spores are formed as a result of the reduction division taking place in the capsule of this sporophyte.

**Fern** – In ferns, the main plant-body is sporophytic. Its leaves are known as sporophylls and these bear the sporangia. Reduction division takes place in these sporangia, thereby producing many spores.

**Gymnosperm** – In gymnosperms, the main plant-body is sporophytic. They bear two types of leaves – microsporophylls and megasporophylls. Reduction division takes place in the microsporangia present on the microsporophylls (producing pollen grains) and on the megasporangia present on the megasporophylls (producing megaspores).

**Angiosperm** – In angiosperms, the main plant-body is sporophytic and bears flowers. The male sex organ in the flower is the stamen, while the female sex organ is the pistil. Reduction division takes place in the anthers of the stamen (producing haploid pollen grain) and in the ovary of the pistil (producing eggs).

**Ex.30** Explain briefly the following terms with suitable examples :-

- |                   |                  |
|-------------------|------------------|
| (I) protonema     | (ii) antheridium |
| (iii) archegonium | (iv) diplonitic  |
| (v) sporophyll    | (vi) isogamy     |

**Sol. (i) Protonema** – It is the first stage in the life cycle of a moss, developing directly from the spore. It consists of creeping, green, branched, and often filamentous structures.

**(ii) Antheridium** – It is the male sex organ present in bryophytes and pteridophytes and is surrounded by a jacket of sterile cells. It encloses the sperm mother cells, which give rise to the male gametes.

**(iii) Archegonium** – It is the female sex organ present in bryophytes, pteridophytes, and gymnosperms. In bryophytes and pteridophytes, it generally has a swollen venter and a tubular neck, and contains the female gamete called the egg.

**(iv) Diplontic** – It is the term used for the life cycle of seed-bearing plants (gymnosperms and angiosperms). In these plants, the diploid sporophyte is dominant, photosynthetic, and independent. The gametophyte is represented by a single-celled (or a few-celled) structure.

**(v) Sporophyll** – In pteridophytes, the sporophytic plant body bears sporangia. These sporangia are subtended by leaf-like appendages known as sporophylls. In gymnosperms, microsporophylls and megasporophylls are found. These bear microspores and megaspores respectively.

**(vi) Isogamy** – It is a type of sexual reproduction involving the fusion of morphologically-similar gametes. This means that the gametes are of the same size, but perform different functions. This type of reproduction is commonly observed in *Spirogyra*.

**Ex.31** Mention the ploidy of the following : protonemal cell of a moss; primary endosperm nucleus in dicot, leaf cell of moss; prothallus cell of a fern ; gemma cell in *Marchantia*; meristem cell of monocot, ovum of a liverwort, and zygote of a fern.

- Sol.**
- (A) Protonemal cell of a moss – Haploid
  - (B) Primary endosperm nucleus in a dicot – Triploid
  - (C) Leaf cell of a moss – Haploid
  - (D) Prothallus of a fern – Haploid
  - (E) Gemma cell in *Marchantia* – Haploid
  - (F) Meristem cell of a monocot – Diploid
  - (G) Ovum of a liverwort – Haploid
  - (H) Zygote of a fern – Diploid

**Ex.32** Match the followings (column I with column II)

**Column I**

- (A) *Chlamydomonas*
- (B) *Cycas*
- (C) *Selaginella*
- (D) *Sphagnum*

**Column II**

- (I) Moss
- (ii) Pteridophyte
- (iii) Algae
- (iv) Gymnosperm

**Sol.**

**Column I**

- (A) *Chlamydomonas*
- (B) *Cycas*
- (C) *Selaginella*
- (D) *Sphagnum*

**Column II**

- (iii) Algae
- (iv) Gymnosperm
- (ii) Pteridophyte
- (I) Moss

**Exercise # 1**

**SINGLE OBJECTIVE**

**NEET LEVEL**

1. Which algal groups have similarity in pigment composition :-  
 (A) Red algae and brown algae  
 (B) Green algae and blue green algae  
 (C) Kelps and diatoms  
 (D) Diatoms and euglenoids
2. Autotrophic thallophytes are called as :-  
 (A) Fungi (B) Lichens  
 (C) Algae (D) Microbes
3. Which of the following is parasitic algae :-  
 (A) Cephaleuros (B) Harveyella  
 (C) Both (A) and (B) (D) None of the above
4. Red algae is red due to the presence of :-  
 (A) R-Phycocyanin (B) R-Phycoerythrin  
 (C) C-Phycocyanin (D) C-Phycoerythrin
5. Sea lettuce is the name given to :-  
 (A) Laminaria (B) Fucus  
 (C) Sargassum (D) Ulva
6. Fertile cells are not enclosed by sterile cells in the group :-  
 (A) Thallophyta (B) Spermatophyta  
 (C) Pteridophyta (D) Bryophyta
7. "Red rust of tea" is caused by parasitic:-  
 (A) Algae (B) Fungi  
 (C) Bacteria (D) Bryophyta
8. No Zoospore formation has been observed in the Algal members belonging to:-  
 (A) Chlorophyceae (B) Xanthophyceae  
 (C) Phaeophyceae (D) Cyanophyceae
9. Which pigment is found in phaeophyceae :-  
 (A) Chl. a, c and fucoxanthin  
 (B) Chl. a, d and violaxanthin  
 (C)  $\gamma$  Carotene and phycocyanin  
 (D) None of these
10. Food reserve in Rhodophyta is :-  
 (A) Floridean starch (B) Mannitol  
 (C) Leucosin (D) All of the above
11. Zygotic meiosis is characteristic of :-  
 (A) Procaryotes (B) Thallophyta  
 (C) Bryophyta (D) Spermatophyta
12. Photosynthetic pigments common to all algae :-  
 (A) Chlorophyll 'b' and carotene  
 (B) Chlorophyll 'a' and 'b'  
 (C) Chlorophyll 'a' and carotene  
 (D) Chlorophyll and xanthophyll
13. *Acetabularia*, a largest unicellular plant, belongs to  
 (A) Chlorophyta (B) Rhodophyta  
 (C) Pyrrophyta (D) Phaeophyta
14. Deepest algae in sea are :-  
 (A) Red Algae (B) Brown Algae  
 (C) Green Algae (D) Golden Algae
15. Phycobilins are characteristic pigments of :-  
 (A) Rhodophyta and Xanthophyta  
 (B) Rhodophyta and Pyrophyta  
 (C) Pyrophyta and Cyanophyta  
 (D) Rhodophyta and Cyanophyta
16. Which of the following plant groups have similar pigment composition :-  
 (A) Rhodophyta and phaeophyta  
 (B) Chlorophyta and phaeophyta  
 (C) Rhodophyta and cyanophyta  
 (D) Xanthophyta and euglenophyta
17. Polyuronic acid and polysulphate esters are characteristic in cell wall of :-  
 (A) Brown Algae (B) Red Algae  
 (C) Dinoflagellates (D) Diatoms
18. Stone wort is common name of :-  
 (A) *Chara* (B) *Chlorella*  
 (C) *Laminaria* (D) *Polysiphonia*



## BIOLOGY FOR NEET & AIMS

19. Irish moss, is a member of :-  
(A) True moss (B) Lichen  
(C) Algae (D) Bryophyte
20. Flagellated cells are absent in :-  
(A) Red algae (B) Blue green algae  
(C) Higher seed plants (D) All the above
21. Which of the following is colour less parasitic red algae :-  
(A) *Cephaleuros* (B) *Harveyella*  
(C) *Polysiphonia* (D) *Laminaria*
22. Green algae are considered as ancestors of higher plants due to their resemblance with higher plants in :-  
(A) Pigments (B) Cell wall  
(C) Stored food (D) All the above
23. Pyrenoids are characteristically found in algae. A pyrenoid consists of :-  
(A) Core of starch surrounded by protein  
(B) Core of protein surrounded by starch  
(C) Core of fatty acids covered by starch  
(D) Nucleic acid and protein
24. In chlorophyta the mode of sexual reproduction is :-  
(A) Isogamy  
(B) Anisogamy  
(C) Oogamy  
(D) Isogamy, Anisogamy and oogamy
25. The name "*Thallophyta*" was coined by :-  
(A) Endlicher (B) Linneaus  
(C) Christenson (D) Hackel
26. Unique character of *Thallophyta* is :-  
(A) Thalloid body  
(B) Absence of vascular tissue  
(C) Zygotic meiosis  
(D) All the above
27. In *thallophyta* main plant body is :-  
(A) Gametophyte (B) Sporophyte  
(C) Diploid plant body (D) Leafy plant body
28. The characters of *thallophyta* is/are :-  
(A) Plant body thallus  
(B) Non vascular plant  
(C) Sex organ are unicellular and without jacket of sterile cell  
(D) All the above
29. Sexual reproduction in *Thallophyta* takes place by :-  
(A) Isogamy (B) Anisogamy  
(C) Oogamy (D) Any of the above
30. Most advanced group of Algae is :-  
(A) Myxophyta (B) Chlorophyta  
(C) Xanthophyta (D) Phaeophyta
31. Which bryophyte indicates algal ancestry of bryophytes :-  
(A) *Riccia* (B) *Riella*  
(C) *Anthoceros* (D) *Marchantia*
32. Leafy gametophyte occur in :-  
(A) Liver worts (B) Horn worts  
(C) Moss (D) Fern
33. The sporophyte of moss absorbs water from gametophyte with the help of :-  
(A) Capsule (B) Seta  
(C) Foot (D) Haustoria
34. Sporophyte with indefinite growth occurs in :-  
(A) Liver worts (B) Horn worts  
(C) Mosses (D) Fern
35. *Sphagnum* may be used as a substitute of :-  
(A) Absorbent cotton (B) Non absorbent cotton  
(C) Plastic (D) Polythene
36. Stem and leaves of bryophyta plants are :-  
(A) Analogous to stem and leaves of higher plants  
(B) Homologous to stem and leaves of higher plants  
(C) Both analogous and homologous  
(D) None
37. Aquatic ancestry of bryophyta is best indicated by :-  
(A) Some bryophyta still aquatic  
(B) Flagellated male gametes  
(C) Aerenchyma in stem  
(D) All the above

38. Non vascular embryophyta are :-  
 (A) Thallophyta (B) Bryophyta  
 (C) Pteridophyta (D) (A) and (B) both
39. The water conducting tissue in bryophyta is :-  
 (A) Parenchyma (B) Sclerenchyma  
 (C) Trachieds (D) Sieve tubes
40. In which of the following elaters are found :-  
 (A) Angiosperms (B) Bryophyta  
 (C) Algae (D) Bacteria
41. Bryophyta are not tall plants due to:-  
 (A) Absence of meristem  
 (B) Absence of vascular tissues  
 (C) Presence of root system  
 (D) All the above
42. In pteridophyta, reduction division occurs when:-  
 (A) Prothallus is formed  
 (B) Spores are formed  
 (C) Sex organs are formed  
 (D) Gametes are formed
43. The main plant body of Pteridophytes is:-  
 (A) Sporophyte (B) Gametophyte  
 (C) Haploid (D) None of the above
44. Cryptogamic plants are:-  
 (A) Seedless (B) Embryoless  
 (C) Leafless (D) Rootless
45. Cone bearing pteridophyta are :-  
 (A) Lycopsidea and Psilopsida  
 (B) Filicinae and Lycopsidea  
 (C) Filicinae and Sphenopsida  
 (D) Lycopsidea and Sphenopsida
46. *Adiantum* is called "walking fern" due to :-  
 (A) Power of locomotion  
 (B) Vegetative reproduction  
 (C) Motile antherozoites  
 (D) All the above
47. Plants having vascular tissues but lacking seeds are :-  
 (A) Bryophyta (B) Pteridophyta  
 (C) Gymnosperms (D) Angiosperms
48. Heterospory and ligulate leaves occur in :-  
 (A) *Selaginella* (B) *Pteridium*  
 (C) *Funaria* (D) *Riccia*
49. In *Lycopodium* the antherozoids are :-  
 (A) Biflagellate (B) Multiflagellate  
 (C) Multiciliate (D) Non motile
50. The aquatic fern, which is an excellent biofertilizer is :  
 (A) *Salvinia* (B) *Azolla pinnata*  
 (C) *Pteridium* (D) *Marsilea*
51. Sporangia are found in fruiting structures called sporocarps in aquatic ferns, which of the following is aquatic fern :-  
 (A) *Azolla* (B) *Selaginella*  
 (C) *Pteridium* (D) *Equisetum*
52. The antherozoids of fern are :-  
 (A) Uniflagellate (B) Biflagellate  
 (C) Quadriflagellate (D) Multiflagellate
53. In which of the following characters, the angiosperms resemble gymnosperms:-  
 (A) Presence of ovule  
 (B) Absence of endosperm  
 (C) Presence of vessels  
 (D) Mode of fertilisation by zoodiosiphonogamy
54. Ovules are naked in gymnosperm because:-  
 (A) Fertilisation is absent  
 (B) True carpels are absent  
 (C) Archegonia are absent  
 (D) Endosperm is absent
55. Which character most differentiates angiosperms from gymnosperms :-  
 (A) Triploid endosperm  
 (B) Vessels in xylem  
 (C) Seeds enclosed in fruits  
 (D) Attractive petals
56. Gametophyte embeded in sporophyte in:-  
 (A) Bryophyta (B) Pteridophyta  
 (C) Cryptogams (D) Spermatophyta



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57. Eggs do not occur in archegonia in:-  
(A) Bryophyta (B) Pteridophyta  
(C) Angiosperms (D) Spermatophyta
58. Antheridia and archegonia are absent in :-  
(A) Bryophyta (B) Pteridophyta  
(C) Gymnosperms (D) Angiosperms
59. Ovules absent in:-  
(A) Pteridophyta (B) Gymnosperm  
(C) Angiosperm (D) (A) and (B) both
60. Ephedrine is obtained by :-  
(A) *Ephedra* (B) *Gnetum*  
(C) *Pinus* (D) *Cycas*
61. In gymnosperms, the pollination is:-  
(A) Anemophilous-micropylar  
(B) Anemophilous-stigmatic  
(C) Entomophilous-micropylar  
(D) Entomophilous-stigmatic
62. Resin turpentine is obtained from:-  
(A) *Pinus* (B) *Adiantum*  
(C) Club mosses (D) *Sequoia*
63. Which group is largest in gymnosperms:-  
(A) Cycadales (B) Gnetales  
(C) Coniferales (D) Cordaitales
64. Spore bearing tracheophytes:-  
(A) Pteridophyta (B) Gymnosperms  
(C) Angiosperms (D) All the above
65. Which of the following Gymnospermic orders resembles with angiosperms:-  
(A) Cycadales (B) Coniferales  
(C) Gnetales (D) Ginkgoales
66. Living fossil:-  
(A) *Cycas* (B) *Ginkgo*  
(C) *Psilotum* (D) All the above
67. "Heterosporous-Archegoniatae" is a name for:-  
(A) Ferns (B) Gymnosperms  
(C) Angiosperms (D) (A) and (B) both
68. Double fertilization takes place in:-  
(A) Angiosperms (B) Gymnosperms  
(C) Spermatophyta (D) Embryophyta
69. *Sequoia* belongs to:-  
(A) Cycadofillicales (B) Gnetales  
(C) Coniferales (D) Dicots
70. Which of the following are absent in group gymnosperm :-  
(A) Trees (B) Shrubs  
(C) Liana (D) Herbs
71. Which plant group is exclusively perennial :-  
(A) Dicots (B) Ferns  
(C) Gymnosperms (D) Monocots
72. In Ginkgoales the male gametes are :-  
(A) Motile (B) Non-motile  
(C) Amoeboid (D) Absent
73. Male gamete of *Cycas* is largest in plant kingdom, is :-  
(A) Non motile (B) Biflagellate  
(C) Multiciliate (D) Uniflagellate
74. The mode of pollination in gymnosperme is :-  
(A) Anemophily (B) Entomophily  
(C) Hydrophily (D) Any of the above
75. Which of the following order of gymnosperme is totally become extinct :-  
(A) Cycadales (B) Ginkgoales  
(C) Gnetales (D) Cycadofillicales
76. Which of the following remained unchanged for last many million years :-  
(A) *Pinus* (B) Rice  
(C) *Acacia* (D) *Ginkgo*
77. Ovule in gymnosperm is generally :-  
(A) Anatropous and bitegmic  
(B) Orthotropous and bitegmic  
(C) Anatropous and unitegmic  
(D) Orthotropous and unitegmic
78. Life cycle of gymnosperm is :-  
(A) Haplontic (B) Haplodiplontic  
(C) Diplontic (D) Diplohaplontic
79. Which of the following is commonly known as "Chilgoza pine" :-  
(A) *Pinus roxburghii* (B) *P. strobus*  
(C) *P. gerardiana* (D) *P. sylvestris*
80. If the haploid no. of chromosomes in gymnosperm is 12, what will be the no. of chromosomes in its root and endosperm :-  
(A) 12, 12 (B) 12, 24  
(C) 24, 12 (D) 24, 36

**Exercise # 2**

**SINGLE OBJECTIVE**

**AIIMS LEVEL**

1. Blue - green Algae resembles more closely to:-  
 (A) Green Algae  
 (B) Brown Algae  
 (C) Red Algae and bacteria  
 (D) Slime molds
2. Which of the following statement is true for algae :-  
 (A) Algae have root, stem and leaves  
 (B) Algae have true roots but lack leaves  
 (C) Algae have rhizoides and leaves  
 (D) Body of algae is thallus
3. In which plant group reproductive organs are not enclosed in a layer of sterile cells:-  
 (A) Pteridophyta                      (B) Thallophyta  
 (C) Angiosperm                        (D) Gymnosperm
4. Classification of algae is mainly based up on :-  
 (A) Reproductive organs  
 (B) Structure of spores  
 (C) Pigments  
 (D) Stored food
5. "Carrageenin" is obtained from :-  
 (A) *Chondrus crispus*              (B) *Laminaria*  
 (C) *Gelidium*                         (D) *Macrocystis*
6. Female sex organ of algae is called :-  
 (A) Carpel                                (B) Oogonium  
 (C) Archegonia                         (D) Oosphere
7. Change in colour of algae according to depth in sea is called :-  
 (A) Bohr's effect                        (B) Gaudikov's effect  
 (C) Fogg's effect                        (D) Pasteur effect
8. In some algae two entire individual fuse with each other. Such a type of sexual reproduction is called—  
 (A) Isogamy  
 (B) Anisogamy  
 (C) Hologamy  
 (D) Gametangial contact
9. Which of the following is not correctly matched :  
 (A) Heterocyst = N<sub>2</sub>-fixation structure of B.G.A.  
 (B) Hormogonia = Reproductive structure of B.G.A  
 (C) Floridean starch = Stored food of brown algae  
 (D) Cyanophycean starch = Stored food of B.G.A.
10. Cilia & flagella are absent in life cycle of:-  
 (A) Red algae                            (B) Brown algae  
 (C) Green algae                         (D) Red algae & B.G.A.
11. Which algae best explains the evolution of sexual reproduction :-  
 (A) Green algae                         (B) Red algae  
 (C) Brown algae                         (D) B. G. Algae
12. Spermatia are male gametes of:-  
 (A) Red algae                            (B) Diatoms  
 (C) Spermatophyta                      (D) Euglena
13. Cap cells occur in :-  
 (A) *Oedogonium*                        (B) Diatoms  
 (C) Dinoflagellates                      (D) *Euglena*
14. Algae which have food conducting tubes similar to phloem in vascular plants are :-  
 (A) Red algae                            (B) Brown algae  
 (C) Blue green algae                    (D) Green algae
15. Chlorophyll 'c', 'd' and 'e' are characteristic pigments of respectively :-  
 (A) Red algae, brown algae and yellow green algae  
 (B) Brown algae, Red algae and yellow green algae  
 (C) Diatoms, Dinoflagellates, Euglena  
 (D) High plants, Red algae, Diatoms
16. Which of the following algae produces synzoospores :-  
 (A) *Chlamydomonas*                    (B) *Polysiphonia*  
 (C) *Chlorella*                            (D) *Vaucheria*
17. Reserve food of algae and fungi are :-  
 (A) Starch and soluble floridoside  
 (B) Oil droplets and fats  
 (C) Starch and glycogen  
 (D) Starch and Glycerol

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18. About 90 percent of total photosynthesis in the world is caused by :-  
(A) Bryophytes (B) Algae  
(C) Pteridophytes (D) Angiosperms
19. Which type of algae are helpful in nitrogen economy :-  
(A) Green algae (B) Blue green algae  
(C) Red algae (D) Brown algae
20. Sea weeds belong to :-  
(A) Red algae (B) Brown algae  
(C) Green algae (D) Blue green algae
21. Plants of thallophyta are :-  
(A) Haploid and gametophyte  
(B) Haploid and sporophyte  
(C) Diploid and gametophyte  
(D) Diploid and sporophyte
22. The first cell of sporophytic generation in bryophyta is:-  
(A) Spore (B) Spore mother cell  
(C) Zygote (D) Protonema
23. Riccia is a bryophyte due to :-  
(A) Thalloid  
(B) Rhizoids  
(C) Alternation of generations  
(D) Dependent sporophyte
24. In which of the following sporogenous tissue (spores) is derived from amphithecium :-  
(A) *Riccia* (B) *Marchantia*  
(C) *Ricciocarpus* (D) *Anthoceros*
25. In bryophyta, organs are referred to as 'Leaf like' and 'Stem like' and not the true leaf and stem because:-  
(A) They lack vascular tissues  
(B) They are non-green  
(C) They do not function as leaf and stem  
(D) All the above
26. Structures for dispersal of spores in bryophyta are :-  
(A) Elaters (B) Pseudoelaters  
(C) Peristomeal teeth (D) All the above
27. Oblique septa in rhizoids are characteristic of :-  
(A) Liverworts (B) Hornworts  
(C) Mosses (D) Ferns
28. In which bryophyta germination of spore is indirect:-  
(A) *Riccia* (B) *Rhizopus*  
(C) *Puccinia* (D) *Funaria*
29. Male gametes of bryophytes are :-  
(A) Uniflagellate (B) Multiflagellate  
(C) Biflagellate (D) Triflagellate
30. Seedless nonvascular plants are :-  
(A) Angiosperm (B) Gymnosperm  
(C) Pteridophyte (D) Bryophytes
31. Rhizoids of hepaticopsida and anthocerotopsida are :-  
(A) Multicellular and branched  
(B) Unicellular and unbranched  
(C) Unicellular and branched  
(D) Multicellular and unbranched
32. Sterile jacket cells around reproductive cells is characteristic of :-  
(A) Algae (B) Bryophyta  
(C) Fungi (D) Thallophyta
33. The vascular tissue is absent in :-  
(A) Algae, fungi and pteridophytes  
(B) Thallophytes and bryophytes  
(C) Bryophytes and pteridophytes  
(D) Angiosperm and gymnosperm
34. The sporophyte of bryophyte is :-  
(A) Parasitic  
(B) Autotrophic  
(C) Saprophytic  
(D) Semiparasitic or parasitic
35. Non vascular land plants are called:-  
(A) Bryophytes (B) Pteridophytes  
(C) Fungi (D) Algae

36. The botanical name of "*Sanjeevani*" is :-  
 (A) *Selaginella utricularia*  
 (B) *Selaginella bryopteris*  
 (C) *Selaginella crotalaria*  
 (D) *Selaginella botardia*
37. Aquatic fern which supports the growth of blue green algae, *Anabaena*, and used to increase the yield of paddy crop is :-  
 (A) *Salvinia* (B) *Marsilea*  
 (C) *Isoetes* (D) *Azolla*
38. Most distinct type of alternation of generations is demonstrated by :-  
 (A) Angiosperms (B) Ferns  
 (C) Gymnosperms (D) Bryophytes
39. Presence of motile stage in life cycle & requirement of water as a medium to complete life cycle is diagnostic characters of :-  
 (A) Thallophyta (B) Bryophyta  
 (C) Pteridophyta (D) Cryptogams
40. Evolution of seed habit first started in :-  
 (A) *Selaginella* like ancestral pteridophytes  
 (B) *Psilotum* like ancestral pteridophytes  
 (C) Gymnosperms (D) Mosses
41. Young fern leaves and rhizome are protected by :-  
 (A) Root cap (B) Ramenta  
 (C) Roots (D) Leaf bases
42. In ferns, the permanent roots are :-  
 (A) Tap root (B) Adventitious roots  
 (C) Tuberous roots (D) Rhizome
43. Independent alternation of generation found in-  
 (A) Pteridophyta (B) Spermatophyta  
 (C) Thallophyta (D) Bryophyta
44. Gametophytes of pteridophytes are :-  
 (A) Short lived, Free living and sexual organ bearing  
 (B) Heart shaped, dependent on sporophyte and sex organ bearing  
 (C) Fibre like, dependent on sporophyte and sex organ bearing  
 (D) Semi parasite on sporophyte
45. Stem distinctly differentiated in to node and internode in :-  
 (A) Psilopsida (B) Lycopsida  
 (C) Sphenopsida (D) Pteropsida
46. Spore producing part of pteridophytes is:-  
 (A) Sporangia of gametophytes  
 (B) Capsule of sporophytes  
 (C) Sporangia of sporophytes  
 (D) Capsule of gametophytes
47. In pteridophytes, reduction division takes place in :-  
 (A) Zygote (B) Spore mother cells  
 (C) Gametangia (D) Prothallus
48. Cambium is absent in :-  
 (A) Pteridophytes (B) Gymnosperms  
 (C) Angiosperms  
 (D) Pteridophytes and gymnosperms
49. Which group of plants is exclusively arborescent (woody) :-  
 (A) Pteridophyta (B) Dicots  
 (C) Gymnosperms (D) Monocots
50. Seeds of gymnosperms have three generations, that is-  
 (A) Two sporophytic and one gametophytic generation  
 (B) Two gametophytic and one sporophytic  
 (C) All the three sporophytic generations  
 (D) All the three gametophytic generations
51. Fossils of *Williamsonia* were first discovered by :-  
 (A) Williamson (B) Seward  
 (C) Birbal sahani (D) Kashyap
52. Gymnosperms maintain their dominance over angiosperms in :-  
 (A) Colder regions of world  
 (B) Warmer regions of world  
 (C) Antarctica  
 (D) Oceans

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53. Professor Birbal Sahani discovered a fossil plant from 100 million years old fossil forest at Rajmahal Hills, Bihar. This plant was :-  
(A) *Rhynia* (B) *Horneophyton*  
(C) *Williamsonia* (D) *Red alga*
54. *Cycas* and ferns resemble each other in possessing :-  
(A) Seeds (B) Ovules  
(C) Pollen tube  
(D) Circinate ptyxis and ramenta
55. Polyembryony is mainly found in :-  
(A) Pteridophyta (B) Bryophyta  
(C) Gymnosperms (D) Angiosperms
56. Which of the following plants produces seeds but not flowers :-  
(A) Maize (B) Mint  
(C) Peepal (D) *Pinus*
57. Taxol is obtained from :-  
(A) *Taxus* (B) *Acetabularia*  
(C) *Cycas* (D) *Pinus*
58. Success and dominance of vascular plants on earth is due to :-  
(A) Development of roots  
(B) Development of water proofing materials like cutin on surface  
(C) Development of conducting tissues  
(D) All the above
59. Which major change occurred in germination of spores during evolution of seed :-  
(A) Endosporic to exosporic  
(B) Exosporic to endosporic  
(C) Direct to indirect  
(D) No change
60. Most specialised (much modified) sporophylls found in :-  
(A) Pteridophyta (B) Gymnosperms  
(C) Angiosperms (D) Spermatophyta
61. The most reduced gametophytic stage is present in -  
(A) Thallophyta (B) Angiospermae  
(C) Gymnospermae (D) Bryophyta
62. The characters of gymnosperms are :-  
(A) Seeds are naked  
(B) Fruits are absent  
(C) True carpel absent  
(D) All
63. Archegoniate plants belong to :-  
(A) Bryophyta, pteridophyta, gymnosperms, angiosperms  
(B) Thallophyta, bryophyta, pteridophyta  
(C) Bryophyta, pteridophyta, angiosperm  
(D) Bryophyta, pteridophyta, gymnosperm
64. Endosperm in gymnosperms is :-  
(A) Haploid & developed after fertilization  
(B) Haploid & developed before fertilization  
(C) Triploid & developed before fertilization  
(D) Triploid & developed after fertilization
65. Study of life in caves is called :-  
(A) Teleology (B) Speleology  
(C) Pedology (D) Exobiology
66. Carolus linnaeus was a native of :-  
(A) England (B) Switzerland  
(C) Austria (D) Sweden
67. Father of green revolution in world is :-  
(A) Mendel (B) Norman borlaugh  
(C) M.S. Swaminathan (D) Kolreuter
68. Pedology is the study of :-  
(A) Soil (B) Sexual behavior  
(C) Fossil formation (D) Fossil fuels
69. Improvement of human race through improvement of human environment is called :-  
(A) Eugenics  
(B) Euthenics  
(C) Euphenics  
(D) Genetic engineering
70. Taxonomy which is based on number of affinities is called :-  
(A) Omega taxonomy (B) Alpha taxonomy  
(C) Numerical taxonomy (D) Karyotaxonomy

70. Study of grasses is called :-  
(A) Dendrology (B) Agrostology  
(C) Pomology (D) Phytology
71. The study of effect of age on living beings is called :-  
(A) Palaeontology (B) Gerontology  
(C) Anthropology (D) Actinobiology
72. S.A. Waksman isolated **Streptomyces** griseus from-  
(A) Air (B) Water  
(C) Mud (D) Soil
73. Ecology of fresh water lake is called :-  
(A) Oceanography (B) Ethnobotany  
(C) Limnology (D) Lac culture
74. Formation and development of pollen grains is studied under:-  
(A) Plant embryology (B) Palynology  
(C) Palaeobotany (D) Pharmacognosy
75. Plant diseases due to deficiency of minerals is studies under:-  
(A) Plant pathology (B) Plant physiology
- (C) Plant embryology (D) Plant ecology
76. Which cytochrome most used in taxonomy:-  
(A) Cytochrome - a (B) Cytochrome - b  
(C) Cytochrome - c (D) Cytochrome - d
77. Cultivation of flowers studied under which branches:-  
(A) Anthology (B) Pomiculture  
(C) Floriculture (D) Olericulture
78. Contribution of Rishi charak and Parashar is included under the branch:-  
(A) Pharmacognosy (B) Physiology  
(C) Palynology (D) Pharmacology
79. M.S. Swaminathan concerned with:-  
(A) Hybridization breeding (B) Mutation breeding  
(C) Genetics (D) Eugenics
80. "Systema mycologicum" book was written by :-  
(A) De berry (B) Fries  
(C) B.B. mundker (D) Mitcheli



**Exercise # 3**

**PART - 1**

**MATRIX MATCH COLUMN**

- Select the correct match from the options given in all algae

(A) Phaeophyceae	-	Mannitol
(B) Rhodophyceae	-	Dictyota
(C) Chlorophyceae	-	Non- motile gametes
(D) Rhodophyceae	-	r-Phycoerythrin

(A) A, B and C      (B) B, C and D      (C) A and C      (D) C and D  
 (E) A and D
- Observe the diagram A, B, C, and D. In which one of the four options all the items are correct

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(A) Chlamydomonas	Chara	Laminaria	Volvox
(B) Laminaria	Volvox	Chlamydomonas	Chara
(C) Chara	Laminaria	Volvox	Chlamydomonas
(D) Volvox	Chlamydomonas	Laminaria	Chara
- Which of these is mismatched

(A) Phaneros	- Visible
(B) Kryptos	- Concealed
(C) Gymmo	- Naked
(D) Bryon	- Liverworths
(E) Trachea	- Windpipe
- Choose the wrong pair.

(A) Hepaticopsida	- Marchantia
(B) Lycopsida	- Selaginella
(C) Bryopsida	- Anthoceros
(D) Pteropsida	- Dryopteris
(E) Sphenopsida	- Equisetum
- Observe the diagrams (A-D) given below and select the right option in which all the four items A - D are correctly identified.

A	B	C	D
(A) Antheridia	Archegonia	Gemma cup	Sphagnum
(B) Archegonia	Antheridia	Gemma cup	Sphagnum
(C) Archegoniophore	Gemma cup	Gametophyte	Sphagnum
(D) Gemma cup	Archegoniophore	Sporophyte	Sphagnum
- Match the following with correct combination

<b>Column - I</b>	<b>Column - II</b>
A. Anthoceros	i. Walking fern
B. Adiantum	ii. Alga
C. Sargassum	iii. Inferae
D. Asterales	iv. Gametophyte
	v. Hornwort
	vi. Liverwort

(A) A - vi, B - v, C - i, D - iii  
 (C) A - v, B - i, C - ii, D - iv  
 (E) A - i, B - iv, C - iii, D - v  
 (B) A - v, B - iv, C - iii, D - ii  
 (D) A - iii, B - ii, C - i, D - v

7. Examine the figure A, B, C and D. In which one of the four options all the items A, B, C and D are correct

**Options :**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(A) Chara	Marchantia	Fucus	Pinus
(B) Equisetum	Ginko	Selaginella	Lycopodium
(C) Selaginella	Equisetum	Salvinia	Ginko
(D) Funaria	Adiantum	Salvinia	Riccia

8. Match the columns

**Column - I**

- A. Hornwort
- B. Liverwort
- C. Stonewort
- D. Club moss

**Column - II**

- i. Lycopodium
- ii. Ricciocarpus
- iii. Anthoceros
- iv. Chara

A	B	C	D
(A) ii	iii	iv	i
(B) ii	iii	i	iv
(C) iii	ii	iv	i
(D) iii	ii	iv	i

9. The given figure is showing life cycle of a plant if this belongs to life cycle of bryophytes, pteridophytes and gymnosperms, what will be respective A and B in their life cycle.

- | <b>A</b>   | <b>B</b>   |
|--|--|
| (A) Bryophytes : Strobili, capsule                 | Pteridophytes : es, sporangia                                  |
| (B) Bryophytes : Protonema, gametophores           | Pteridophytes : Strobili, sporangia                            |
| (C) Bryophytes : Capsule, protonema (gametophores) | Pteridophytes : sporangia cones, sporophyll                    |
| (D) Bryophytes : Sporangium, capsule               | Pteridophytes : strobili, sporangia                            |
|  | Gymnosperms : flowers, cones                                   |
|  | Gymnosperms : flower, cones                                    |
|  | Gymnosperms : fertile fronds, megasporangia and microsporangia |
|  | Gymnosperms : flowers, cones                                   |

10. Match Column - I with Column - II and select the correct option from the codes given below.

**Column - I**

- A. Artificial system of classification
- B. Natural system of classification
- C. Phylogenetic system of classification

**Column - II**

- i. Bentham and Hooker
- ii. Linnaeus
- iii. Englar and Prantl

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

11. Select the incorrect pair.

- |                        |   |                                 |
|------------------------|---|---------------------------------|
| (A) Numerical taxonomy | - | All observable characteristic   |
| (B) Cytotaxonomy       | - | Cytological information         |
| (C) Chemotaxonomy      | - | Chromosome number and structure |
| (D) Cladistic taxonomy | - | Origin from a common ancestor   |

12. Match Column - I with Column - II and select the correct option from the codes given below.

**Column - I**

- A. Non-vascular cryptogams
- B. Vascular cryptogams
- C. Phanerogams

**Column - II**

- i. Gymnosperms, angiosperms
- ii. Pteridophytes
- iii. Algae, nryophyes

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

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13. Match Column - I with Column - II and select the correct option from the codes given below.
- | Column - I     | Column - II               |
|----------------|---------------------------|
| A. Food        | i. Brown algae            |
| B. Agar        | ii. Porphyra, Laminaria   |
| C. Algin       | iii. Gelidium, Gracilaria |
| D. Carrageenin | iv. Red algae             |
- (A) A - ii, B - iii, C - i, D - iv  
(B) A - ii, B - iii, C - iv, D - i  
(C) A - iii, B - ii, C - iv, D - i  
(D) A - iii, B - ii, C - i, D - iv
14. Which of the following is a correct match of algae class with its characteristic reserve food ?
- |                   |   |                     |
|-------------------|---|---------------------|
| (A) Chlorophyceae | - | Starch              |
| (B) Phaeophyceae  | - | Mannitol, laminarin |
| (C) Rhodophyceae  | - | Floridean starch    |
| (D) All of these  |   |                     |
15. Select the correct match of algae class and its characteristic flagellation.
- |                   |   |                     |
|-------------------|---|---------------------|
| (A) Chlorophyceae | - | 2-8 equal, apical   |
| (B) Phaeophyceae  | - | 2, unequal, lateral |
| (C) Rhodophyceae  | - | Absent              |
| (D) All of these. |   |                     |
16. Match Column - I with Column - II and select the correct option from the codes given below.
- | Column - I                 | Column - II        |
|----------------------------|--------------------|
| A. Spirogyra               | i. Unicellular     |
| B. Chlamdomonas            | ii. Filamentous    |
| C. Volvox                  | iii. Colonial form |
| D. Some giant marine forms | iv. Kelps          |
- (A) A - ii, B - i, C - iii, D - iv  
(B) A - ii, B - iii, C - iv, D - i  
(C) A - iii, B - ii, C - iv, D - i  
(D) A - iii, B - ii, C - i, D - iv
17. Select the option that correctly identifies A and B in the given figure.
- | A                | B            |
|------------------|--------------|
| (A) Sporophyte   | Gametophyte  |
| (B) Gametophyte  | Sporophyte   |
| (C) Male shoot   | Female shoot |
| (D) Female shoot | Male shoot   |
18. Select the option that correctly identifies A, B and C in the given figure of female thallus of Marchantia.
- (A) A - Antheridiophore, B - Gemma cup, C - Rhizoidis  
(B) A - Antheridiophore, B - Rhizoidis C - Gemma cup  
(C) A - Archegoniophore, B - Gemma cup, C - Rhizoidis  
(D) A - Archegoniophore, B - Rhizoidis C - Gemma cup
19. Which of the following options correctly identifies the plant shown in figure and the group it belongs to ?
- |                 |   |              |
|-----------------|---|--------------|
| (A) Selaginella | - | Pteridophyte |
| (B) Sphagnum    | - | Moss         |
| (C) Sphagnum    | - | Liverwort    |
| (D) Funaria     | - | Moss         |

20. Identify the plants shown in figure and select the correct option.
- |                 |           |
|-----------------|-----------|
| <b>A</b>        | <b>B</b>  |
| (A) Sphagnum    | Dichytota |
| (B) Selaginella | Ginko     |
| (C) Selaginella | Salvinia  |
| (D) Cycas       | Ginko     |
21. In Pteridophytes, main plant body is (i), which is (ii) into true roots, stem and leaves. Fill the blanks in above statement and select the correct option.
- |                 |                    |
|-----------------|--------------------|
| <b>(A)</b>      | <b>(B)</b>         |
| (A) Sporophyte  | differentiated     |
| (B) Sporophyte  | not differentiated |
| (C) Gametophyte | differentiated     |
| (D) Gametophyte | not differentiated |
22. Identify the parts labelled A and B in the given figure of Equisetum and select the correct option.
- |                 |          |
|-----------------|----------|
| <b>A</b>        | <b>B</b> |
| (A) Strobilus   | Rhizome  |
| (B) Sporophylls | Tuber    |
| (C) Sporangia   | Rhizome  |
| (D) Sporophyte  | Tuber    |
23. Match Column - I with Column - II and select the correct option from the codes given below.
- |                   |                    |
|-------------------|--------------------|
| <b>Column - I</b> | <b>Column - II</b> |
| A. Psilosida      | i. Psilotum        |
| B. Lycopsida      | ii. Equisetum      |
| C. Sphenosida     | iii. Selaginella   |
| D. Pteropsida     | iv. Dryopteris     |
- |                                    |                                    |
|------------------------------------|------------------------------------|
| (A) A - i, B - ii, C - iii, D - iv | (B) A - i, B - iv, C - iii, D - ii |
| (C) A - i, B - iii, C - ii, D - iv | (D) A - i, B - iii, C - iv, D - ii |
24. Match Column - I with Column - II and select the correct option from the codes given below.
- |                   |                          |
|-------------------|--------------------------|
| <b>Column - I</b> | <b>Column - II</b>       |
| A. Sagoplam       | i. Ephedra               |
| B. Chilgoza fruit | ii. Pinus gerardiana     |
| C. Ephedrine      | iii. Cycas revoluta      |
| D. Cedar wood oil | iv. Juniperus virginiana |
- |                                    |                                    |
|------------------------------------|------------------------------------|
| (A) A - iv, B - ii, C - i, D - iii | (B) A - iii, B - ii, C - i, D - iv |
| (C) A - iii, B - iv, C - i, D - ii | (D) A - ii, B - iii, C - i, D - iv |
25. Select the mismatched pair.
- |               |   |                              |
|---------------|---|------------------------------|
| (A) Cycas     | - | Living fossil                |
| (B) Thuja     | - | Agar production              |
| (C) Pinus     | - | Resin, turpentine production |
| (D) Araucaria | - | Ornamental plant             |
26. Identify the gymnosperms shown in figure and select the correct option.
- |           |          |
|-----------|----------|
| <b>A</b>  | <b>B</b> |
| (A) Cycas | Cedrus   |
| (B) Pinus | Cycas    |
| (C) Ginko | Pinus    |
| (D) Cycas | Ginko    |

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27. The given figure shows two phases, A and B of a typical angiospermic life cycle. Select the correct option regarding it.
- | A                               | B                           |
|---------------------------------|-----------------------------|
| (A) Gametophytic generation (n) | Sporophytic generation (2n) |
| (B) Sporophytic generation (2n) | Gametophytic generation (n) |
| (C) Sporophytic generation (2n) | Sporophytic generation (2n) |
| (D) Gametophytic generation (n) | Gametophytic generation (n) |
28. Select the mismatched pair.
- |   |                 |
|---|-----------------|
| (A) Amphibians of plant kingdom                         | - Bryophytes    |
| (B) First terrestrial plants to possess vascular tissue | - Gymnosperms   |
| (C) Water required for fertilization                    | - Pteridophytes |
| (D) Seeds enclosed in fruits                            | - Angiosperms   |
29. Match Column - I with Column - II and select the correct option from the codes given below.
- | Column - I    | Column - II      |
|---------------|------------------|
| A. Pteris     | i. Bryophyte     |
| B. Cedrus     | ii. Pteridophyte |
| C. Sonchus    | iii. Gymnosperm  |
| D. Marchantia | iv. Angiosperm   |
- (A) A - ii, B - iii, C - iv, D - i  
(B) A - ii, B - i, C - iv, D - iii  
(C) A - i, B - iii, C - iv, D - ii  
(D) A - iii, B - iv, C - ii, D - i
30. Select the mismatched pair.
- |                                   |                      |
|-----------------------------------|----------------------|
| (A) Smallest angiosperm           | - Rafflesia          |
| (B) Tallest angiosperm            | - Eucalyptus regnans |
| (C) Marine angiosperms            | - Zostera, Thalassia |
| (D) Angiosperm with smallest seed | - Orchid             |
31. Angiosperms A and B shown in the figure belong to class \_\_\_ and \_\_\_ respectively.
- | A                   | B               |
|---------------------|-----------------|
| (A) Dicotyledonae   | Monocotyledonae |
| (B) Monocotyledonae | Dicotyledonae   |
| (C) Monocotyledonae | Monocotyledonae |
| (D) Dicotyledonae   | Dicotyledonae   |

## Exercise # 3

## PART - 2

## ASSERTION &amp; REASONING

- Directions :** In the following questions, a statements of assertion is followed by a statement of reason. Mark the correct choice as :
- (A) If both assertion and reason are true and reason are true and reason is the correct explanation of assertion  
 (B) If both assertion and reason are true but reason is not the correct explanation of assertion.  
 (C) If assertion is true but reason is false.  
 (D) If both assertion and reason are false.  
 (E) If the assertion is false but reason is true.
- Assertion :** Biennial plants flower in two year.  
**Reason :** The biennial plants live for two years.
  - Assertion :** Bryophytes and tracheophytes have an embryo stage in their life cycle.  
**Reason :** Embryophyta are terrestrial plants.
  - Assertion :** Stamens are comparable to microsporophylls.  
**Reason :** Ovules are comparable to megasporophylls.
  - Assertion :** Algae and fungi are grouped in thallophyta.  
**Reason :** Algae and fungi show no differentiation in thallus.
  - Assertion :** Each group of algae has characteristic colour.  
**Reason :** Each group of algae show predominance of one pigment.
  - Assertion :** Only red algae are able to flourish at the great depth of sea.  
**Reason :** Red algae has pigments r-phycoerythrin and r-phyocyanin.
  - Assertion :** Spermatangium of red algae bears trichogyne.  
**Reason :** Trichogyne helps in reproduction.
  - Assertion :** Spirogyra is slippery in touch.  
**Reason :** Spirogyra consists a gelatinous sheath.
  - Assertion :** Isogamy is a primitive type of sexual reproduction.  
**Reason :** The gametes are of different sizes.
  - Assertion :** Angiosperms lack flagellate male gametes.  
**Reason :** Sperms are not dependent on water for fertilization.
  - Assertion :** Fertilized ovule forms seed.  
**Reason :** Ripened ovary forms fruit.
  - Assertion :** Pyrenoids are utilised during starvation.  
**Reason :** Pyrenoids are proteinaceous bodies.
  - Assertion :** In green algae, the eye-spot is present in the cell.  
**Reason :** Eye-spot is meant for respiration.
  - Assertion :** Chlorella could be utilised to keep the air pure in space vehicles.  
**Reason :** The space travelers feed on chlorella soup.
  - Assertion :** Flower is aggregation of sporophylls.  
**Reason :** Sporophylls are modified in angiosperms.
  - Assertion :** Chlorella could serve as a potential source of food and energy.  
**Reason :** When dried, chlorella has 15 % protein, 45 % fat, 10 % carbohydrate, 20 % fibre, and 10 % minerals and vitamins.
  - Assertion :** Spirogyra shows haplontic life cycle.  
**Reason :** Zygotic meiosis occurs in spirogyra.
  - Assertion :** Red algae contribute in producing coral reef.  
**Reason :** Some red algae secrete and deposit calcium carbonate on their walls.
  - Assertion :** The sex organs in the bryophytes are jacketed.  
**Reason :** Bryophytes are land plants.
  - Assertion :** All bryophytes are land plants.  
**Reason :** Water is necessary to complete their life cycle.
  - Assertion :** The bryophytes exist in two phase gametophyte and sporophyte.  
**Reason :** The sporophyte is nutritionally independent.
  - Assertion :** Unlike thallophytes, bryophytes show formation of embryo.  
**Reason :** The embryo gives rise to gametophyte plant of bryophytes.
  - Assertion :** Bryophytes possess archegonium as a female sex organ.  
**Reason :** Algae also possess the archegonium.
  - Assertion :** The embryo of bryophyte is independent.  
**Reason :** The zygote of thallophyte is dependent.



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25. **Assertion :** Liverworts fail to spread to a new locality through fragmentation.  
**Reason :** Gemmae are helpful in propagating liverworts in different locality.
26. **Assertion :** Pinus displays the alternation of generations.  
**Reason :** The gametophyte is dependent upon the sporophyte phase.
27. **Assertion :** Pinus embryo has two cotyledons.  
**Reason :** Pinus shows polyembryony.
28. **Assertion :** The female cones take much time to mature.  
**Reason :** The seeds are shed when the cone is 22 months old.
29. **Assertion :** The female cones are same in number as male cones.  
**Reason :** Male and female cones appears alternately on the same branch of the pinus.
30. **Assertion :** Sperms of Riccia are biflagellate.  
**Reason :** Sperms show swimming nature.
31. **Assertion :** The sporogonium of Riccia is the simplest among the liverworts.  
**Reason :** Sporophyte consists of capsule only.
32. **Assertion :** The young stem of Funaria is photosynthetic.  
**Reason :** It contain hydroids.
33. **Assertion :** Pinus is monoecious.  
**Reason :** Each sporophyll bears only one microsporangia.
34. **Assertion :** Funaria multiplied vegetatively by means of bulbils.  
**Reason :** Bulbils and tubers are two different structures.
35. **Assertion :** Gemmae formation in Funaria occurs in favourable condition.  
**Reason :** The gemmae form on the stem and leaves.
36. **Assertion :** Funaria is monoecious.  
**Reason :** Cross fertilization occurs in Funaria.
37. **Assertion :** Antheridia of Funaria are sunk in pit.  
**Reason :** Its antheridial cluster is surrounded by perigonial leaves .
38. **Assertion :** The peristome is a fringe of teeth-like projections found at the mouth of the capsule.  
**Reason :** It may be of two types nematodontous and orthodontus.
39. **Assertion :** The mesophyll of Pinus shows no distinction as mesophyll and palisade.  
**Reason :** Parenchymatous cells are present in mesophyll of pinus.
40. **Assertion :** Pinus shows formation of annual rings.  
**Reason :** Pinus grows in area of environmental fluctuation.
41. **Assertion :** Mosses are used as pollution indicators.  
**Reason :** They absorb metal.
42. **Assertion :** Mosses are evolved from algae.  
**Reason :** Protonema of mosses is similar to some green algae.
43. **Assertion :** The sorus of pteridium is of coenosorus type.  
**Reason :** Pteridium lack sori.
44. **Assertion :** Coenosorus lacks true indusium.  
**Reason :** Indusium covers sori.
45. **Assertion :** Ramenta are scale which cover young rhizome and leaves of Dryopteris.  
**Reason :** Pteridium lacks ramenta.
46. **Assertion :** The scale leaves on the long shoots are called cataphylls.  
**Reason :** Cataphylls lack mid rib.
47. **Assertion :** Both bryophytes and pteridophytes contain well-developed antheridia.  
**Reason :** Biflagellate sperms are formed by their antheridia.
48. **Assertion :** Water is not required for fertilization process in fern.  
**Reason :** Malic acid of archegonial neck attracts antherozoids.
49. **Assertion :** Sporophytes of pteridophyta are dominant individual.  
**Reason :** They do not show the formation of true root.
50. **Assertion :** In gymnosperms, plants show well-developed vessels and fibres.  
**Reason :** Companion cells are absent in gymnosperm.
51. **Assertion :** In leptosporangiate development, sporangia are formed from a group of initials.  
**Reason :** Eusporangiate development of sporangia starts from single initial.

52. **Assertion :** Adiantum caudatum is called walking fern.  
**Reason :** It can reproduce by its leaf tips.
53. **Assertion :** Gymnosperms seeds are naked.  
**Reason :** They lack ovary wall.
54. **Assertion :** Pinus has a pyramidal appearance.  
**Reason :** The older parts of long shoot have scars of fallen dwarf shoots.
55. **Assertion :** The female cone of Cycas is not true cone.  
**Reason :** Its formation checks the growth of the stem.
56. **Assertion :** All living species of Cycas are dioecious.  
**Reason :** Cycas contains male and female cones on the same plant.
57. **Assertion :** The male of Cycas change in size when the microspores became mature.  
**Reason :** The microspores are dispersed by wind.
58. **Assertion :** Red colour of Rhodophyta is due to abundant formation of r-phycoerythrin.  
**Reason :** r-Phycoerythrin is able to absorb blue green wavelength of light and reflect red colour.
59. **Assertion :** Brown algae vary from olive green to brown in colour.  
**Reason :** Fucoxanthin is responsible for colour variation in brown algae.
60. **Assertion :** In pteridophytes, zygote produces a multicellular sporophyte.  
**Reason :** Sporophyte is the dominant phase in life cycle of pteridophytes.
61. **Assertion :** In gymnosperms, the male and female gametophytes do not have independent existence.  
**Reason :** They remain within the sporangia retained on the sporophyte.
62. **Assertion :** In angiosperms, each cell of the embryo sac is haploid.  
**Reason :** In angiosperms, embryo sac formation is preceded by meiosis.
63. **Assertion :** In chlorophyceae, plant body is usually grass green.  
**Reason :** Members of chlorophyceae, possess chlorophyll a, c, carotenoids and xanthophyll.
64. **Assertion :** Mosses are of great ecological importance.  
**Reason :** Mosses prevent soil erosion by forming dense mat on the soil.
65. **Assertion :** Selaginella and Salvinia are homosporous.  
**Reason :** Similar kind of spores are produced in Selaginella and Salvinia.
66. **Assertion :** Gymnosperms do not produce fruit.  
**Reason :** Ovules of gymnosperms are enclosed within the ovaries.
67. **Assertion :** In diplontic life cycle, gametophyte is dominant.  
**Reason :** In diplontic life cycle, there is no free living sporophyte.
68. **Assertion :** Chlorella and spirulina are used as a food supplement by space travellers.  
**Reason :** Chlorella and spirulina are unicellular algae.
69. **Assertion :** Spores in mosses are contained within the capsule.  
**Reason :** Spores are formed by mitotic division in mosses.
70. **Assertion :** Bryophytes are called as terrestrial amphibians.  
**Reason :** Bryophytes require an external layer of water the soil surface for their existence.
71. **Assertion :** Stomata are found on the surface of leaves in gymnosperms.  
**Reason :** In gymnosperms, cuticle of leaves is thin.
72. **Assertion :** Algae show only anisogamous type of reproduction.  
**Reason :** In algae, gametes can never be non-flagellated.

**Exercise # 4**

**PART - 1**

**PREVIOUS YEAR (NEET/AIPMT)**

1. Sexual reproduction in *Spirogyra* is an advanced feature because it shows [CBSE AIPMT-2003]
  - (A) physiologically differentiated sex organs
  - (B) different size of motile sex organs
  - (C) same size of motile sex organs
  - (D) morphologically different sex organs
  
2. Which one pair of examples will correctly represent the grouping spermatophyta according to one of the schemes of classifying plants ? [CBSE AIPMT-2003]
  - (A) *Rhizopus, Triticum*      (B) *Ginkgo, Pisun*
  - (C) *Acacia, sugarcane*      (D) *Pinus, Cycas*
  
3. Which one the following pairs of plants are not seed producers ? [CBSE AIPMT-2003]
  - (A) *Ficus* and *Chlamydomonas*
  - (B) *Punica* and *Pinus*
  - (C) *Fern* and *Funaria*
  - (D) *Funaria* and *Ficus*
  
4. Angiosperms have dominated the land flora primarily because of their [CBSE AIPMT-2004]
  - (A) power of adaptability in diverse habitat
  - (B) Property of producing large number of seeds
  - (C) nature of some pollination
  - (D) domestication by man
  
5. A free living nitrogen fixing cyanobacterium which can also form symbiotic association with the water fern *Azolla* is - [CBSE AIPMT-2004]
  - (A) *Tolypothrix*      (B) *Chlorella*
  - (C) *Nostoc*      (D) *Anabaena*
  
6. Which one of the following is a living fossil ? [CBSE AIPMT-2003]
  - (A) *Tolypothrix*      (B) *Chlorella*
  - (C) *Nostoc*      (D) *Anabaena*
  
7. Which of the following propagates through leaf-tip? [CBSE AIPMT-2004]
  - (A) Walking fern      (B) Sproux - leaf plant
  - (C) *Marchantia*      (D) Moss
  
8. Match items in column i with those in column II [CBSE AIPMT-2005]
 

<b>Column-I</b> A. Peritrichous B. Living fossil C. Rhizophore D. Smallest flowering plant E. Largest perennial alga	<b>Column-II</b> 1. <i>Ginkgo</i> 2. <i>Macrocystis</i> 3. <i>Escherichia coli</i> 4. <i>Selaginella</i> 5. <i>Wolffia</i>
---	---

Select the correct answer from the following.

A.	B	C	D	E
(A) 3	1	4	5	2
(B) 2	1	3	4	5
(C) 5	3	2	5	1
(D) 1	5	5	3	2
  
9. Ectophloic siphonostele is found in [CBSE AIPMT-2005]
  - (A) *Adiantum* and *Cucurbitaceae*
  - (B) *osmunda* and *Equisetum*
  - (C) *Marsilea* and *Botrychium*
  - (D) *Dicksonia* and maiden hair fern
  
10. Conifers differ from grasses in the [CBSE AIPMT-2006]
  - (A) lack of xylem tracheids
  - (B) absence of pollen tubes
  - (C) formation of endosperm before fertilisation
  - (D) production of seeds from ovules
  
11. Peat moss is used as a packing material for sending flowers and live plants to distant place because [CBSE AIPMT-2006]
  - (A) it is hygroscopic
  - (B) it reduces transpiration
  - (C) it serves as a disinfectant
  - (D) it is easily available

12. In gymnosperms, the pollen chamber represents  
[CBSE AIPMT-2007]  
(A) a cell in the pollen grain in which the sperms are formed  
(B) a cavity in the ovule in which pollen grains are stored after pollination  
(C) an opening in the megagametophyte through which the pollen tube approaches the egg  
(D) the microsporangium in which pollen grains develop
13. Flagellated male gametes are present in all the three of which one of the following sets ?  
[CBSE AIPMT-2007]  
(A) *Anthoceros*, *Funaria* and *Spirogyra*  
(B) *Zygnema*, *Saprolegnia* and *Hydrilla*  
(C) *Fucus*, *Marselia* and *Calotropis*  
(D) *Riccia*, *Dryopteris* and *Cycas*
14. If you are asked to classify the various algae into distinct groups, which of the following characters you should choose ? [CBSE AIPMT-2007]  
(A) Types of pigments present in the cell  
(B) nature of stored food materials in the cell  
(C) Structural organisation of thallus  
(D) Chemical composition of the cell wall
15. Spore dissemination in some liverworts is aided by [CBSE AIPMT-2007]  
(A) elaters (B) indusium  
(C) calyptra (D) peristome teeth
16. In the prothallus of a vascular cryptogam, the antherozoids and eggs mature at different times, as a result [CBSE AIPMT-2007]  
(A) there is no change in success rate of fertilisation  
(B) there is high degree of sterility  
(C) one can conclude that the plant is apomictic  
(D) self fertilisation is prevented
17. Select one of the following pairs of important features distinguishing Gnetum from *Cycas* and *Pinus* and showing affinities with angiosperms . [CBSE AIPMT-2008]  
(A) absence of resin duct and leaf venation  
(B) presence of vessel elements and absence of archegonia  
(C) perianth and two integuments  
(D) embryo development and apical meristem
18. Replum is present in the ovary of flower of [CBSE AIPMT-2008]  
(A) lemon (B) mustard  
(C) sunflower (D) pea
19. Which one of the following is heterosporous? [CBSE AIPMT-2008]  
(A) *Dryopteris* (B) *Salvinia*  
(C) *Adiantum* (D) *Cedrus*
20. In which one of the following, male and female gametophytes don't have free living independent existence ? [CBSE AIPMT-2008]  
(A) *Pteris* (B) *Funaria*  
(C) *Polytrichum* (D) *Cedrus*
21. Which one of the following plants is monoecious ? [CBSE AIPMT-2009]  
(A) *Marchantia* (B) *Pinus*  
(C) *Cycas* (D) *Papaya*
22. Which one of the following is considered important in the development of seed habit ? [CBSE AIPMT-2009]  
(A) Dependent sporophyte  
(B) Heterospory  
(C) Haplontic life cycle  
(D) Free - living gametophyte
23. Which one of the following is a vascular cryptogam ? [CBSE AIPMT-2009]  
(A) *Equisetum* (B) *Ginkgo*  
(C) *Marchantia* (D) *Cedrus*

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24. Mannitol is the stored food in [CBSE AIPMT-2009]  
(A) *Chara* (B) *Porphyra*  
(C) *Fucus* (D) *Gracilaria*
25. Male and female gametophytes are independent and free-living in [CBSE AIPMT-2010]  
(A) mustard (B) castor  
(C) *Pinus* (D) Sphagnum
26. Algae have cell wall made up of [CBSE AIPMT-2010]  
(A) cellulose, galactans and mannans  
(B) hemicellulose, pectins and proteins  
(C) pectins, cellulose and proteins  
(D) cellulose, hemicellulose and pectins
27. A prokaryotic autotrophic nitrogen fixing symbiont is found in [CBSE AIPMT-2011]  
(A) *Cycas* (B) *Cicer*  
(C) *Pisum* (D) *Alnus*
28. Archegoniophore is present in [CBSE AIPMT-2011]  
(A) *Chara* (B) *Adiantum*  
(C) *Funaria* (D) *Marchantia*
29. The gametophyte is not an independent, free living generation in [CBSE AIPMT-2011]  
(A) *Adiantum* (B) *Marchantia*  
(C) *Pinus* (D) *Polytrichum*
30. Compared with the gametophytes of the bryophytes, the gametophytes of vascular plants tends to be [CBSE AIPMT-2011]  
(A) larger but to have smaller sex organs  
(B) larger and to have large sex organs  
(C) smaller and to have smaller sex organs  
(D) smaller but to have larger sex organs
31. Gymnosperms are also called soft wood spermatophytes because they lack [CBSE AIPMT-2012]  
(A) cambium (B) phloem fibres  
(C) thick-walled tracheids (D) xylem fibres
32. Which one of the following is common to multicellular fungi, filamentous algae and protonema of mosses ? [NEET-2013]  
(A) Diplontic life cycle  
(B) Members of kingdom-Plantae  
(C) Mode of nutrition  
(D) Multiplication by fragmentation
33. Which one of the following is a correct statement ? [NEET-2013]  
(A) Pteridophyte gametophyte has a protonemal and leafy stage  
(B) In gymnosperms female gametophyte is free-living  
(C) Antheridiophores and archegoniophores are present in pteridophytes  
(D) Origin of seed habit can be traced in pteridophytes.
34. *Cycas* and *Adiantum* resemble each other [NEET-2013]  
(A) seeds (B) motile sperms  
(C) cambium (D) vessels
35. Read the following statements and answer the question which follows them [NEET-2013]  
I. In liverworts, mosses and ferns gametophytes are free living.  
II. Gymnosperms and some ferns are heterosporous.  
III. Sexual reproduction in *Fucus*, *Volvox* and *Albugo* is oogamous,  
IV. The sporophyte in liverworts is more elaborate than that in mosses.  
How many of the above statements are correct.  
(A) One (B) Two  
(C) Three (D) Four

36. Select the wrong statement. [CBSE AIPMT-2013]  
 (A) Isogametes are similar in structure, function and behaviour  
 (B) Anisogametes differ either in structure, function and behaviour  
 (C) In oomycetes female gamete is smaller and motile, while male gamete is larger and non-motile  
 (D) *Chlamydomonas* exhibits both isogamy and anisogamy and *Fucus* show oogamy
37. Besides paddy fields, cyanobacteria are also cells is present in [CBSE AIPMT-2013]  
 (A) *Pinus* (B) *Cycas*  
 (C) *Equisetum* (D) *Psilotum*
38. Male gametophyte with leaf number of cells is present in [CBSE AIPMT-2014]  
 (A) *Pteris* (B) *Funaria*  
 (C) *Lilium* (D) *Pinus*
39. An alga which can be employed as food for human being is . [CBSE AIPMT-2014]  
 (A) *Ulothrix* (B) *Chlorella*  
 (C) *Spirogyra* (D) *Polysiphonia*
40. Which of the following is responsible for peat formation? [CBSE AIPMT-2014]  
 (A) *Marchantia* (B) *Riccia*  
 (C) *Funaria* (D) *Sphagnum*
41. Which one of the following is wrong about *chara*? [CBSE AIPMT-2014]  
 (A) Upper oogonium and lower round antheridium  
 (B) Globule and nucule present on the same plant  
 (C) Upper antheridium and lower oogonium  
 (D) Globule is male reproductive structure
42. Which one of the following shows isogamy with non-flagellated gametes? [CBSE AIPMT-2014]  
 (A) *Sargassum* (B) *Ectocarpus*  
 (C) *Ulothrix* (D) *Spirogyra*
43. Which one is a wrong statement? [CBSE AIPMT-2015]  
 (A) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms  
 (B) *Mucor* has biflagellate zoospores  
 (C) Haploid endosperm is typical feature of gymnosperms  
 (D) Brown algae have chlorophyll-a and c, and fucoxanthin
44. Which one of the following statements is wrong? [NEET-2016]  
 (A) Algae increase the level of dissolved oxygen in the immediate environment  
 (B) Algin is obtained from red algae and carrageenan from brown algae  
 (C) Agar-agar is obtained from *Gelidium* and *Gracilaria*  
 (D) *Laminaria* and *Sargassum* are used as food
45. Conifers are adapted to tolerate extreme environmental conditions because of [NEET-2016]  
 (A) broad hardy leaves  
 (B) superficial stomata  
 (C) thick cuticle  
 (D) the presence of vessels
46. Select the correct statement. [NEET-2016]  
 (A) *Salvinia*, *Ginkgo* and *Pinus* all are gymnosperms  
 (B) Sequoia is one of the tallest trees  
 (C) The leaves of gymnosperms are not well adapted to extremes of climate  
 (D) Gymnosperms are both homosporous and heterosporous
47. In bryophytes and pteridophytes, transport of male gametes requires [NEET-2016, phase-I]  
 (A) insects (B) birds  
 (C) water (D) wind



## BIOLOGY FOR NEET & AIMS

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48. Life cycle of Ectocarpus and Fucus [NEET-2017]  
(A) Haplontic, Diplontic  
(B) Diplontic, Haplodiplontic  
(C) Haplodiplontic, Diplontic  
(D) Haplodiplontic, Haplontic
49. An example of colonial alga is [NEET-2017]  
(A) *Chlorella* (B) *volvox*  
(C) *Ulothrix* (D) *Spirogyra*
50. Zygotic meiosis is characteristic of [NEET -2017]  
(A) *Marchantia* (B) *Fucus*  
(C) *Funaria* (D) *Chlamydomonas*
51. Which of the following statements is correct ?  
[NEET -2018]  
(A) Horsetails are gymnosperms  
(B) Selaginella is heterosporous, while Salvinia is homosporous  
(C) Ovules are not enclosed by ovary wall in gymnosperms  
(D) Stems are usually unbranched in both Cycas and Cedrus.
52. After karyogamy followed by meiosis, spores are produced exogenously in [NEET -2018]  
(A) *Agaricus* (B) *Alternaria*  
(C) *Neurospora* (D) *Saccharaomyces*

**Exercise # 4**

**PART - 2**

**PREVIOUS YEAR (AIIMS)**

1. Algae are useful because they [AIIMS- 2003]
  - (A) are large in number
  - (B) are used in alcoholic fermentation
  - (C) purify the atmosphere
  - (D) are used in curdling of milk
  
2. In Ulothrix meiosis takes place in [AIIMS- 2004]
  - (A) cells of the filament
  - (B) holdfast
  - (C) zygote
  - (D) zoospores
  
3. Mosses and ferns are found in moist and shady places because both [AIIMS- 2004]
  - (A) require presence of water for fertilisation
  - (B) do not need sunlight for photosynthesis
  - (C) depend for their nutrition on microorganisms which can survive only at low temperature
  - (D) cannot compete with sun-loving plants.
  
4. Select one of the following pairs of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms. [AIIMS- 2008]
  - (A) perianth and two integuments.
  - (B) embryo development and apical meristem.
  - (C) absence of resin duct and leaf venation.
  - (D) presence of vessel elements and absence of archegonia.
  
5. Ectophloic siphonostele is found in [AIIMS- 2008]
  - (A) Osmunda and Equisetum
  - (B) Marsilea and Botrychium
  - (C) Adiantum and Cucurbitaceae
  - (D) dicksonia and Maidenhair fern.
  
6. Which of the following statements about Spirogyra is correct? [AIIMS- 2009]
  - (A) Lateral conjugation takes place in homothallic species
  - (B) Scalariform conjugation takes place in homothallic species
  - (C) Lateral conjugation takes place in heterothallic species
  - (D) the type of conjugation is unrelated to homothallic and heterothallic species
  
7. Gametophyte and sporophyte are independent of each other in which of the following groups? [AIIMS- 2010]
  - (A) Pteridophytes
  - (B) Angiosperms
  - (C) Gymnosperms
  - (D) Bryophytes
  
8. Which statement is correct regarding mosses? [AIIMS- 2011]
  - (A) They have dominant and independent sporophyte.
  - (B) Their antherozoids require water for fertilization.
  - (C) Their archegonia produce many eggs.
  - (D) Their antherozoids are multiflagellated.
  
9. Occurrence of triploid (3n) primary endosperm nucleus is a characteristic feature of [AIIMS- 2013]
  - (A) algae
  - (B) gymnosperms
  - (C) angiosperms
  - (D) bryophytes
  
10. Match column - I with column - II and select the correct option from the codes given below. [AIIMS- 2014]
 

Column - I	Column - II
A. Chlorophyta	(i) Equisetum
B. Lycopsida	(ii) Chara
C. Phaeophyta	(iii) Selaginella
D. Sphenopsida	(iv) Ectocarpus

  - (A) A - (ii), B - (iii), C - (iv), D - (i)
  - (B) A - (iv), B - (i), C - (ii), D - (iii)
  - (C) A - (ii), B - (iii), C - (i), D - (iv)
  - (D) A - (iv), B - (i), C - (iii), D - (ii)
  
11. Which of the given genera is homosporous? [AIIMS- 2015]
  - (A) Cycas
  - (B) Pinus
  - (C) Selaginella
  - (D) Lycopodium
  
12. Which of the following genera is associated with coralloid roots? [AIIMS- 2015]
  - (A) Cycas
  - (B) Taxus
  - (C) Pinus
  - (D) Sequoia
  
13. Which of the following groups of algae produces algin? [AIIMS- 2015]
  - (A) Phaeophyceae and Chlorophyceae
  - (B) Rhodophyceae and Phaeophyceae
  - (C) Chlorophyceae and Rhodophyceae
  - (D) Phaeophyceae only

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14. Match the following and select the correct option.

[AIIMS- 2015]

**Column - I**

- A. Pteris  
B. Cycas  
C. Sphagnum  
D. Porphyra

**Column - II**

- (i) Gymnosperm  
(ii) Bryophyte  
(iii) Algae  
(iv) Pteridophyta

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

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

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

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

15. Which of the following are homosporous pteridophytes ?

[AIIMS- 2016]

- i. Selaginella  
iii. Salvinia

- ii. Lycopodium  
iv. Equisetum

(A) i and iv only

(B) ii and iii only

(C) ii and IV only

(D) iii and iv only

16. Match column I with column II and choose the correct option.

[AIIMS- 2017]

**Column-I**

- A. Family  
B. Kingdom  
C. Order  
D. Species  
E. Genus

**Column-II**

- I. tuberosum  
II. Polymoniales  
III. Solanum  
IV. Plantae  
V. Solanaceae

(A) A - IV; B - III; C - V; D - II; E - I

(B) A - V; B - IV; C - II; D - I; E - III

(C) A - IV; B - V; C - II; D - I; E - III

(D) A - V; B - III; C - II; D - I; E - IV

17. Consider the following statements regarding the major pigments and stored food in the different groups of algae and choose the correct option

(i) In chlorophyceae, the stored food material is starch and the major pigments are chlorophylla and d.

(ii) In phaeophyceae, laminarian is the stored food and major pigments are chlorophyll-a and b.

(iii) In rhodophyceae, floridean starch is the stored food and the major pigments are chlorophyll-a, d and phycoerythrin. [AIIMS- 2017]

(A) (i) is correct, but (ii) and (iii) are incorrect

(B) (i) and (ii) are correct, but (iii) is incorrect

(C) (i) and (iii) are correct, but (ii) is incorrect

(D) (iii) is correct, but (i) and (ii) are incorrect

**Directions :** In the following questions, a statements of assertion is followed by a statement of reason. Mark the correct choice as :

(A) If both assertion and reason are true and reason are true and reason is the correct explanation of assertion

(B) If both assertion and reason are true but reason is not the correct explanation of assertion.

(C) If assertion is true but reason is false.

(D) If both assertion and reason are false.

(E) If the assertion is false but reason is true.

18. **Assertion :** Red algae contribute in producing coral reefs. [AIIMS- 2004]

**Reason :** Some red algae secrete and deposit calcium carbonate over their walls.

19. **Assertion :** Conifer trees produce a large quantity of wind borne pollen grains. [AIIMS- 2007]

**Reason :** the pollen grains of conifers have wings which help them float with wind currents.

20. **Assertion :** The primary protenema of moss by death and decay of cells may break into fragments. [AIIMS- 2008]

**Reason :** Each fragment gives rise to leafy gametophyte.

21. **Assertion :** In angiosperms, transport of food and water is more efficient than gymnosperms and pteridophytes. [AIIMS- 2011]

**Reason :** In angiosperms longitudinally arranged sieve elements and vessels with perforated end walls are present.

22. **Assertion :** The leaves in gymnosperms are well-adapted to withstand extremes of temperature, humidity and wind. [AIIMS- 2014]

**Reason :** Unlike bryophytes and pteridophytes, in gymnosperms the male and female gametophytes do not have an independent free-living existence.

23. **Assertion :** Sphagnum is slowly carbonised, compressed and fossilised over thousands of years to produce a dark spongy mass called peat. [AIIMS- 2016]

**Reason :** Peat helps to keep soil porous and it also improves water holding capacity of the soil.

24. **Assertion :** Psilotum is living fossil [AIIMS- 2018]

**Reason :** Equisetum in heterosporous pteridophyte

**MOCK TEST**

- Which one of the following statements is wrong?
  - (A) Algae increase the level of dissolved oxygen in the immediate environment.
  - (B) Algin is obtained from the red algae, and carrageenan from brown algae.
  - (C) Agar-agar is obtained from *Gelidium* and *Gracilaria*.
  - (D) *Laminaria* and *Sargassum* are used as food.
- Find out the wrong statements.
  - A. Ulothrix and Spirogyra are filamentous forms.
  - B. Porphyra and Laminaria are fresh water algae.
  - C. Stored food is in the form of mannitol in Rhodophyceae members.
  - D. *Chlorella* and *Spirulina* are unicellular algae.
  - (A) A and B                      (B) B and C                      (C) A and C                      (D) A and D
  - (E) b and D
- Which of the following groups of algae produces algin?
  - (A) Phaeophyceae and Chlorophyceae                      (B) Rhodophyceae and Phaeophyceae
  - (C) Chlorophyceae and Rhodophyceae                      (D) Phaeophyceae only
- Which out of the following is a mismatched pair?
  - (A) Rhodophyceae                      – Floridean starch, phycoerythrin
  - (B) Chlorophyceae                      – Laminarin, Mannitol
  - (C) Rhodophyceae                      – Non-flagellated gametes
  - (D) Phaeophyceae                      – Chlorophyll a and c, fucoxanthin
- Which one of the following shows isogamy with non-flagellated gametes?
  - (A) *Sargassum*                      (B) *Ectocarpus*                      (C) *Ulothrix*                      (D) *Spirogyra*
- Which of the following groups of algae belongs to Class Rhodophyceae?
  - (A) *Laminaria*, *Fucus*, *Porphyra*, *Volvox*                      (B) *Gelidium*, *Porphyra*, *Dictyota*, *Fucus*
  - (C) *Gracilaria*, *Gelidium*, *Porphyra*, *Polysiphonia*                      (D) *Volvox*, *Spirogyra*, *Ulothrix*, *Sargassum*
  - (E) *Sargassum*, *Laminaria*, *Fucus*, *Dictyota*
- Match the following and choose the correct combination from the option given.
 

Column I	Column II
(Alga type)	(Example)
A. Green alga	i. <i>Dictyota</i>
B. Brown alga	ii. <i>Porphyra</i>
C. Red alga	iii. <i>Spirogyra</i>
(A) A-iii, B-ii, C-i	(B) A-iii, B-i, C-ii
(C) A-ii, B-iii, C-i	(D) A-(i), B-ii, C-iii
(E) A-i, B-iii, C-ii	

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8. Match the storage products listed under column I with the organisms given under column II. Choose the appropriate option from the given choices.

**Column I**

- A. Glycogen
- B. Pyrenoids
- C. Laminarin and mannitol
- D. Floridean starch

(A) A-v, B-iii, C-i, D-iii

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

**Column II**

- i. *Sargassum*
  - ii. *Nostoc*
  - iii. *Polysiphonia*
  - iv. *Spirogyra*
  - v. *Agaricus*
- (B) A-iii, B-iv, C-i, D-v  
(D) A-iv, B-iii, C-v, D-ii

9. Select the wrong statement.

- (A) In oomycetes, female gamete is smaller and motile, while male gamete is larger and non-motile.
- (B) *Chlamydomonas* exhibits both isogamy and anisogamy and *Fucus* shows oogamy.
- (C) Isogametes are similar in structure, function and behaviour.
- (D) Anisogametes differ either in structure, function or behaviour.

10. Consider the following statements with respect to algae.

- A. Fusion between one large, non-motile female gamete and a smaller, motile male gamete is termed as oogamous.
- B. Fusion of two gametes dissimilar in size is termed as isogamous.
- C. Fusion of two gametes similar in size is called anisogamous.
- D. In chlorophyceae the major pigments are chlorophyll a and b, and the food is stored as starch.
- E. In rhodophyceae the major pigments are chlorophyll a and d, and the food is stored as mannitol.

Of the above statements.

(A) A and E alone are correct

(B) C and E alone are correct

(C) A and B alone are correct

(D) A and D alone are correct

(E) B and D alone are correct

11. Choose the correct order of colours with respect to pigments, chlorophyll, phycoerythrin and fucoxanthin.

(A) Green, red and brown

(B) Brown, green and red

(C) Red, green and brown

(D) Green, brown and red

(E) Brown, red and green

12. Iodine is found in

(A) *Fucoxanthin*

(B) *Polysiphonia*

(C) *Laminaria*

(D) diatom

13. Algae have cells made up of

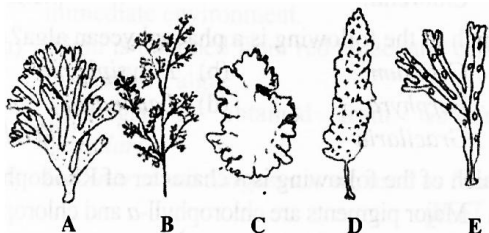
(A) cellulose, galactans and mannans

(B) hemicellulose, pectins and proteins

(C) pectins, cellulose and proteins

(D) cellulose, hemicellulose and pectins.

14.



In the diagram given above, some of the algae have been labelled as 'A', 'B', 'C', 'D' and 'E'. These algae are respectively identified as

- (A) *Dictyota*, *Polysiphonia*, *Porphyra*, *Fucus* and *Laminaria*  
 (B) *Porphyra*, *Dictyota*, *Laminaria*, *Fucus* and *Polysiphonia*  
 (C) *Dictyota*, *Polysiphonia*, *Porphyra*, *Laminaria* and *Fucus*  
 (D) *Fucus*, *Porphyra*, *Dictyota*, *Polysiphonia*, and *Laminaria*  
 (E) *Laminaria*, *Polysiphonia*, *Porphyra*, *Dictyota* and *Fucus*
15. In *Spirogyra* lateral conjugation takes place in the cells of  
 (A) same filament (B) two filaments of same species  
 (C) two filaments of different species (D) both (A) and (B)
16. If you are asked to classify the various algae into distinct groups, which of the follows characters you should choose?  
 (A) Nature of stored food materials in the cell (B) Structural organisation of thallus  
 (C) Chemical composition of the cell wall (D) Types of pigments present in the cell
17. Which of the following statements is wrong about bryophytes?  
 (A) Bryophytes are also called amphibians of the plant kingdom.  
 (B) The gametophyte is the main plant body.  
 (C) Sexual reproduction takes place in the presence of water.  
 (D) Sporophyte is not free-living but attached to the photosynthetic gametophyte.  
 (E) Zygote develops into a gametophyte.
18. Pick out the statement that does not apply to bryophytes.  
 (A) Include the ferns and horsetails. (B) Thallus is a gametophyte.  
 (C) Sporophyte shows foot, seta and capsule (D) Gemmae help in reproduction  
 (E) Water is required for fertilisation
19. Read the following statements (A-E) and answer the question which follows them.  
 (A) In liverworts, mosses, and ferns gametophytes are free-living.  
 (B) Gymnosperms and some ferns are heterosporous.  
 (C) Sexual reproduction in *Fucus*, *Volvox* and *Albugo* is oogamous.  
 (D) The sporophyte in liverworts is more elaborate than that in mosses.  
 (E) Both, *Pinus* and *Marchantia* are dioecious.  
 How many of the above statements are correct?  
 (A) Three (B) Four (C) One (D) Two



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20. Which one of the following is common to multicellular fungi, filamentous algae and protonema of mosses?  
(A) Diplontic life cycle (B) Members of kingdom plantae  
(C) Mode of nutrition (D) Multiplication by fragmentation
21. Which of the following statements about pteridophytes is true?  
(A) The homosporous forms are precursors to the seed habit.  
(B) Gametophyte is the dominant plant body.  
(C) First terrestrial plants to possess vascular tissues.  
(D) *Equisetum* is a member of Pteropsida.  
(E) Photosynthetic thalloid sporophyte is called prothallus.
22. Which one of the following statements is wrong?  
(A) Algae increase the level of dissolved oxygen in the immediate environment.  
(B) Algin is obtained from red algae, and carrageenan from brown algae.  
(C) Agar-agar is obtained from *Gelidium* and *Gracilaria*.  
(D) Laminaria and Sargassum are used as food.
23. Match the plant structures given in the column I with their plants given in the column II.
- | Column I           | Column II         |
|--------------------|-------------------|
| A. Prothallus      | i. Bryophytes     |
| B. Microsporophyll | ii. Pteridophytes |
| C. Protonema       | iii. Angiosperms  |
| D. PEN             | iv. Gymnosperms   |
- (A) A-ii, B-iv, C-iii, D-i (B) A-iii, B-i, C-iv, D-ii (C) A-ii, B-iv, C-i, D-iii (D) A-iv, B-iii, C-i, D-ii
24. Consider the following statements with respect to angiosperms.  
A. The male sex organ in a flower is the stamen.  
B. The anthers following mitosis produce pollen grains.  
C. In an embryo sac, the primary endosperm nucleus (PEN) is diploid.  
D. After double fertilisation the ovules develop into seeds and ovaries develop into fruit.  
Of the above statements  
(A) C and D are correct (B) A and B are correct  
(C) A and C are correct (D) A and D are correct  
(E) B and C are correct
25. Diplontic type of life cycle is seen in  
(i) *Fucus* (ii) Gymnosperms (iii) Pteridophytes (iv) Bryophytes  
(A) (i) only (B) (i) and (iv) only (C) (i) and (iii) only (D) (iii) only  
(E) (i) and (ii) only

26. **Assertion :** Red colour of Rhodophyta is due to abundant formation of r-phycoerythrin.  
**Reason :** r-Phycoerythrin is able to absorb blue green wavelength of light and reflect red colour.
27. **Assertion :** Brown algae vary from olive green to brown in colour.  
**Reason :** Fucoxanthin is responsible for colour variation in brown algae.
28. **Assertion :** In pteridophytes, zygote produces a multicellular sporophyte.  
**Reason :** Sporophyte is the dominant phase in life cycle of pteridophytes.
29. **Assertion :** In gymnosperms, the male and female gametophytes do not have independent existence.  
**Reason :** They remain within the sporangia retained on the sporophyte.
30. **Assertion :** In angiosperms, each cell of the embryo sac is haploid  
**Reason :** In angiosperms, embryo sac formation is preceded by meiosis.

**ANSWER KEY****EXERCISE-1**

1. C 2. C 3. C 4. B 5. D 6. A 7. A 8. D 9. A 10. A 11. B 12. C 13. A  
14. A 15. D 16. C 17. B 18. A 19. C 20. D 21. B 22. D 23. B 24. D 25. A 26. C  
27. A 28. D 29. D 30. B 31. C 32. C 33. C 34. B 35. A 36. A 37. B 38. B 39. A  
40. B 41. B 42. B 43. A 44. A 45. D 46. B 47. B 48. A 49. A 50. B 51. A 52. D  
53. A 54. B 55. C 56. D 57. C 58. D 59. A 60. A 61. A 62. A 63. C 64. D 65. C  
66. D 67. B 68. A 69. C 70. D 71. C 72. A 73. C 74. A 75. D 76. D 77. D 78. C  
79. C 80. C

**EXERCISE-2**

1. C 2. D 3. B 4. C 5. A 6. B 7. B 8. C 9. C 10. D 11. A 12. A 13. A  
14. B 15. B 16. D 17. C 18. B 19. B 20. B 21. A 22. C 23. D 24. D 25. A 26. D  
27. C 28. D 29. C 30. D 31. B 32. B 33. B 34. D 35. A 36. B 37. D 38. B 39. D  
40. A 41. B 42. B 43. A 44. A 45. C 46. C 47. B 48. A 49. C 50. A 51. C 52. A  
53. C 54. D 55. C 56. D 57. A 58. D 59. B 60. C 61. B 62. D 63. D 64. B 65. B  
66. D 67. B 68. A 69. B 70. C 71. B 72. B 73. D 74. C 75. A 76. B 77. C 78. C  
79. A 80. B

**EXERCISE-3: PART-1**

1. (E) 2. D 3. D 4. C 5. C 6. C 7. C 8. D 9. C 10. A 11. C 12. A 13. A  
14. D 15. D 16. A 17. A 18. C 19. B 20. B 21. A 22. A 23. C 24. B 25. B 26. A  
27. A 28. B 29. A 30. A 31. B

**PART-2**

1. B 2. B 3. B 4. A 5. A 6. (\*) 7. E 8. A 9. C 10. A 11. B 12. B 13. C  
14. B 15. B 16. C 17. A 18. A 19. A 20. E 21. C 22. C 23. C 24. D 25. B 26. B  
27. E 28. B 29. D 30. A 31. A 32. B 33. C 34. C 35. (E) 36. B 37. E 38. B 39. B  
40. A 41. A 42. A 43. C 44. B 45. B 46. D 47. D 48. E 49. C 50. E 51. D 52. A  
53. A 54. B 55. C 56. C 57. B 58. A 59. B 60. B 61. A 62. A 63. C 64. B 65. D  
66. C 67. D 68. B 69. C 70. A 71. D 72. D

**EXERCISE-4: PART-1**

1. A 2. B 3. C 4. A 5. D 6. A 7. A 8. A 9. B 10. C 11. A 12. B 13. D  
14. A 15. A 16. D 17. B 18. B 19. B 20. A 21. B 22. B 23. A 24. C 25. D 26. A  
27. A 28. D 29. C 30. C 31. D 32. D 33. D 34. B 35. C 36. C 37. B 38. C 39. B  
40. D 41. C 42. D 43. B 44. B 45. C 46. B 47. C 48. C 49. B 50. D 51. C 52. A

**EXERCISE-4: PART-2**

1. C 2. C 3. A 4. D 5. A 6. A 7. A 8. B 9. C 10. A 11. D 12. A 13. D  
14. B 15. C 16. B 17. D 18. A 19. A 20. B 21. A 22. B 23. B 24. C

**MOCKTEST**

1. B 2. B 3. D 4. B 5. D 6. C 7. B 8. A 9. A 10. D 11. A 12. C 13. A  
14. C 15. A 16. D 17. E 18. A 19. A 20. D 21. E 22. A 23. C 24. D 25. E 26. A  
27. B 28. B 29. A 30. A