This Chapter “Topic-wise + Chapter-wise DPPs of Biology” is taken from our Book:

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Product Name : Biology Topic-Wise & Chapter-Wise Daily Practice Problem (DPP) Sheets for NEET/ AIIMS/ JIPMER

Product Description : The book “Biology Topic-wise and Chapter-wise Daily Practice Problem (DPP) Sheets for NEET 3rd Edition” is precise, apt and tuned to all the requirements of a NEET aspirant.

The DPP Sheets contains:

1. Well Crafted collection of questions. The book is divided into 2 parts - Topic-wise DPP followed by Chapter-wise DPP Sheets.

2. Part A Sheets divides the complete NEET Biology syllabus into 60 most important Topics. Each chapter has been broken into 2 or more topics.

3. Part B provides 38 Chapter-wise DPPs based on the NCERT.

4. Time Limit, Maximum Marks, Cut-off, Qualifying Score for each DPP Sheet is provided.

5. These sheets will act as an Ultimate tool for Concept Checking and Speed Building.

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7. Covers all important Concepts of each Topic

8. As per latest pattern and syllabus of NEET exam.

10. No matter where you prepare from – a coaching or NCERT books or any other textbook/ Guide Daily Practice Problem Sheets provides you the right assessment on each topic.
1. Floridean starch is found in
   (a) Chlorophyceae
   (b) Rhodophyceae
   (c) Phaeophyceae
   (d) Cyanophyceae

2. Peat moss is another name of
   (a) Sphagnum
   (b) Marchantia
   (c) Riccia
   (d) Dryopteris

3. Pteridophytes differ from mosses/bryophytes in possessing
   (a) independent gametophyte
   (b) well developed vascular system
   (c) archegonia structure
   (d) flagellate spermatozoids

4. Most plants are green in colour because
   (a) the atmosphere filters out all the colours of the visible light spectrum except green.
   (b) green light is the most effective wavelength region of the visible spectrum in sunlight for photosynthesis.
   (c) chlorophyll is least effective in absorbing green light.
   (d) green light allows maximum photosynthesis.

5. In Chlorophyceae, sexual reproduction occurs by
   (a) isogamy and anisogamy
   (b) isogamy, anisogamy and oogamy
   (c) oogamy only
   (d) anisogamy and oogamy

**RESPONSE GRID**

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Space for Rough Work
6. A water fern which is used as a green manure in rice fields is
   (a) *Salvinia*  (b) *Mucor*  
   (c) *Aspergillus*  (d) *Azolla* 
7. The largest flower found is known as
   (a) *Rafflesia*  (b) *Tecoma*  
   (c) *Musa*  (d) Cauliflower
8. In fern, spores are formed in
   (a) sporangium  (b) oogonium  
   (c) archegonium  (d) stomium
9. *Laminaria* (kelp) and *Fucus* (rock weed) are the examples of
   (a) red algae  (b) brown algae  
   (c) green algae  (d) golden brown algae
10. People recovering from long illness are often advised to
    include the alga *Spirulina* in their diet because it
    (a) makes the food easy to digest.  (b) is rich in proteins.  
    (c) has antibiotic properties.  (d) restores the intestinal microflora.
11. Which of the following cell organelle remains enveloped by
    a single unit membrane?
    (a) Mitochondria  (b) Lysosomes  
    (c) Nucleus  (d) Chloroplast
12. 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 chlorophyll-\(a\) and \(d\).
   (ii) In Phaeophyceae, laminarin 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.
    (a) (i) is correct, but (ii) and (iii) are wrong.  (b) (i) and (ii) are correct, but (iii) is wrong.  
    (c) (i) and (iii) are correct, but (ii) is wrong.  (d) (iii) is correct, but (i) and (ii) are wrong.
13. Algae have cell wall made up of
    (a) cellulose, galactans and mannans  
    (b) hemicellulose, pectins and proteins  
    (c) pectins, cellulose and proteins  
    (d) cellulose, hemicellulose and pectins.
14. Which plays an important role in the dispersal of spores in *Funaria*?
    (a) Operculum  (b) Capsule  
    (c) Peristome and annulus  (d) Sporogonium
15. Read the following five statements (i – v) and answer the question.
   (i) In *Equisetum* the female gametophyte is retained on the parent sporophyte.  
   (ii) In *Ginkgo* male gametophyte is not independent.  
   (iii) The sporophyte in *Riccia* is more developed than that in *Polytrichum*.  
   (iv) Sexual reproduction in *Volvox* is isogamous.  
   (v) The spores of slime molds lack cell walls.  
   How many of the above statements are correct?
    (a) Two  (b) Three  
    (c) Four  (d) One
16. 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
17. Which one of the following is a correct statement?
    (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
18. What is the similarity between gymnosperms and angiosperms?
   (a) Phloem of both have companion cells.
   (b) Endosperm is formed before fertilization in both.
   (c) Origin of ovule and seed is similar in both.
   (d) Both have leaves, stem and roots.

19. In Chlorophyceae, sexual reproduction occurs by
   (a) isogamy and anisogamy
   (b) isogamy, anisogamy and oogamy
   (c) oogamy only
   (d) nisogamy and oogamy

20. In gymnosperms, the ovule is naked because
   (a) ovary wall is absent
   (b) integuments are absent
   (c) perianth is absent
   (d) nucellus is absent

21. How many meiotic division would be required to produce 101 female gametophytes in an angiosperm?
   (a) 101
   (b) 26
   (c) 127
   (d) None of these

22. Which one of the following is the major difference between mosses and ferns?
   (a) Ferns lack alternation of generation while mosses show the same.
   (b) Mosses are facultative aerobes while ferns are obligate aerobes.
   (c) Vascular bundles of ferns show xylem vessels while those of mosses lack it.
   (d) Sporophytes of ferns live much longer as compared to the sporophytes of mosses.

23. Red snow causing alga is
   (a) Chlamydomonas nivalis
   (b) Chlamydomonas reinhardtii
   (c) Chlamydomonas debaryanum
   (d) Chalmydomonas media

24. Alginates (alginin), used as highly efficient gauze in internal operations are obtained from cell walls of
   (a) Cyanophyceae
   (b) Phaeophyceae
   (c) Rhodophyceae
   (d) All of these

25. Bryophytes resemble algae in the following aspects
   (a) Filamentous body, presence of vascular tissues and autotrophic nutrition
   (b) Differentiation of plant body into root, stem and leaves and autotrophic nutrition
   (c) Thallus like plant body, presence of root and autotrophic nutrition
   (d) Thallus like plant body, lack of vascular tissues and autotrophic nutrition

26. In sexual life cycle of Agaricus, dikaryotization (n + n) is brought about by
   (a) Fusion of male and female sex organs
   (b) Fusion of vegetative cells of different genotypes
   (c) Somatogamy between basidiospores
   (d) Fusion of motile gametes

27. Read the following features properly
   A. Free living
   B. Mostly photosynthetic
   C. Mostly parasitic
   D. Inconspicuous
   E. Unicellular
   How many of the given features are correct for prothallus of pteridophytes?
   (a) Three
   (b) Five
   (c) Four
   (d) Two

28. Identify the correctly matched pair:

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29. Angiosperms have dominated the land flora primarily because of their
   (a) power of adaptability in diverse habitat
   (b) property of producing large number of seeds
   (c) nature of self pollination
   (d) domestication by man

**RESPONSE GRID**

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**Space for Rough Work**
30. Which out of the following are included under tracheophyta i.e., vascular plants?
   (a) Pteridophytes  (b) Gymnosperms
   (c) Angiosperms  (d) All of these

31. At least a half of the total CO₂ fixation on earth is carried out through photosynthesis by
   (a) angiosperms  (b) gymnosperms
   (c) algae  (d) bryophytes

32. The embryonic development in bryophytes takes place in the
   (a) protonema  (b) sporangium
   (c) antheridium  (d) archegonium.

33. The spread of living pteridophytes is limited and is restricted to narrow geographical region because of
   (a) gametophytic growth needs cool, damp and shady places
   (b) requirement of water for fertilization
   (c) absence of stomata in leaf and absence of vascular tissue
   (d) both (a) and (b)

34. Gymnosperm called as a living fossil is
   (a) Cycas  (b) Ginkgo
   (c) Juniperus  (d) Both (a) and (b).

35. The sporophyte is the dominant phase in
   (a) pteridophytes  (b) gymnosperms
   (c) angiosperms  (d) all of these.

36. Which kind of life-cycle pattern is exhibited by seed-bearing plants?
   (a) Haplontic  (b) Diplontic
   (c) Haplo-diplontic  (d) All of these.

37. Plants reproducing by spores such as mosses and ferns are grouped under the general term
   (a) Thallophytes  (b) Cryptogams
   (c) Bryophytes  (d) Sporophytes

38. Angiosperms have dominated the land flora primarily because of their
   (a) Power of adaptability in diverse habitat
   (b) Property of producing large number of seeds
   (c) Nature of self pollination
   (d) Domestication by man

39. Many blue-green algae occur in thermal springs (hot water springs). The temperature tolerance of these algae have been attributed to their
   (a) cell wall structure
   (b) mitochondrial structure
   (c) modern cell organization
   (d) importance of homopolar bonds in their proteins

40. Which of the following occurs both in fresh as well as in marine water ?
   (a) Spirogyra  (b) Cladophora
   (c) Oedogonium  (d) Cephaleuros

41. The pyrenoids are made up of
   (a) proteinaceous centre and starchy sheath
   (b) core of protein surrounded by fatty sheath
   (c) core of starch surrounded by sheath of protein
   (d) core of nucleic acid surrounded by protein sheath

42. Blue green algae have
   (a) chlorophyll  (b) xanthophyll
   (c) phycocyanin  (d) fucoxanthin

43. Parasitic alga is
   (a) Volvox  (b) Ulothrix
   (c) Porphyra  (d) Cephaleuros

44. Which one of the following pairs of plants are not seed producers?
   (a) Funaria and Pinus  (b) Fern and Funaria
   (c) Funaria and Ficus  (d) Ficus and Chlamydomonas

45. Neck canal cells are absent in archegonia of –
   (a) Bryophytes  (b) Gymnosperms
   (c) Pteridophytes  (d) All of these
1. Which form of RNA has a structure resembling clover leaf?
   (a) rRNA  (b) hn RNA  (c) m RNA  (d) t RNA

2. Other than DNA polymerase, which is/are the enzyme(s) involved in DNA synthesis?
   (a) Topoisomerase  (b) Helicase  (c) RNA primase  (d) All of these

3. The enzyme used for joining two DNA fragments is called:
   (a) ligase  (b) restriction endonuclease  (c) DNA polymerase  (d) gyrase

4. Nucleotide arrangement in DNA can be seen by
   (a) X-ray crystallography  (b) electron microscope  (c) ultracentrifuge  (d) light microscope

5. The okazaki fragments in DNA chain growth
   (a) polymerize in the 3’- to - 5’ direction and forms replication fork
   (b) prove semi-conservative nature of DNA replication
   (c) polymerize in the 5’- to - 3’ direction and explain 3’- to - 5’ DNA replication
   (d) result in transcription

6. Reverse transcriptase is
   (a) RNA dependent RNA polymerase  (b) DNA dependent RNA polymerase  (c) DNA dependent DNA polymerase  (d) RNA dependent DNA polymerase

7. Telomerase is an enzyme which is a
   (a) simple protein  (b) RNA  (c) ribonucleoprotein  (d) repetitive DNA

8. DNA template sequence of CTGATAGC is transcribed over mRNA as
   (a) GUCTU TCG  (b) GACUAUCG  (c) GAUTATUG  (d) UACTATCU
9. During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and
   (a) RNA primers are involved
   (b) is facilitated by telomerase
   (c) moves in one direction of the site
   (d) moves in bi-directional way

10. The enzyme, which helps to cut one strand of DNA duplex to release tension of coiling of two strands is
    (a) DNA ligase
    (b) DNA polymerase I
    (c) topoisomerase
    (d) helicase or unwindases

11. Histones are
    (a) glycoproteins (b) mucoproteins
    (c) basic proteins (d) acid proteins

12. One gene-one enzyme relationship was established for the first time in
    (a) Salmonella typhimurium
    (b) Escherichia coli
    (c) Diplococcus pneumoniae
    (d) Neurospora crassa.

13. The transforming principle of Pneumococcus as found out by Avery, MacLeod and McCarty was
    (a) mRNA (b) DNA
    (c) protein (d) polysaccharide

14. How many pair of nucleotides are present in one helix of B-DNA?
    (a) 10 (b) 12
    (c) 5 (d) 6

15. Read the following four statements (i - iv).
    (i) In transcription, adenosine pairs with uracil.
    (ii) Regulation of lac operon by repressor is referred to as positive regulation.
    (iii) The human genome has approximately 50,000 genes.
    (iv) Haemophilia is a sex-linked recessive disease.
    How many of the above statements are correct?
    (a) Two (b) Three
    (c) Four (d) One

16. In negative operon
    (a) co-repressor binds with repressor
    (b) co-repressor does not bind with repressor
    (c) co-repressor binds with inducer
    (d) cAMP have negative effect on lac operon

17. Transfer of genetic material from one bacterium to another in the transduction process is through
    (a) conjugation
    (b) bacteriophages
    (c) another bacterium
    (d) physical contact between donor and recipient strain

18. Telomere and eukaryotic chromosome possesses short segments of
    (a) guanine rich repeats.
    (b) thymine rich repeats.
    (c) cytosine rich repeats.
    (d) adenine rich repeats.

19. Refer the given figure of nucleosome and select the option that correctly identifies the parts A, B and C.
    |   |   |
    | A | B | C |
    |----|----|----|
    | DNA | Histone octamer | H1 histone |
    | Histone | H1 histone | DNA octamer |
    | Histone | DNA | H1 histone |
    | DNA | H1 histone | Histone octamer |

20. The process of transformation is not affected by which of the following enzymes?
    (a) DNase (b) RNase
    (c) Peptidase (d) Lipase
    (a) A, B (b) A, B, C, D
    (c) B, C, D (d) A, B, C

21. Select the incorrect statement regarding DNA replication
    (a) Leading strand is formed is 5' → 3' direction
    (b) Okazaki fragments are formed in 5' → 3' direction
    (c) DNA polymerase catalyses polymerisation in 5' → 3' direction
    (d) DNA polymerase catalyses polymerisation in 3' → 5' direction

**RESPONSE GRID**

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| 19. | abcd | 20. | abcd | 21. | abcd |

*Space for Rough Work*
22. Identify the labels A, B, C and D in the given structure of tRNA and select the correct option.

![tRNA structure](image)

- **A** Anticodon loop
- **B** TΨC loop
- **C** AA binding site
- **D** DHU loop

(a) Anticodon loop TΨC loop AA binding site DHU loop
(b) AA binding site TΨC loop Anticodon loop DHU loop
(c) AA binding site DHU loop Anticodon loop TΨC loop
(d) AA binding site DHU loop TΨC loop Anticodon loop

23. In one polynucleotide strand of a DNA molecule the ratio of A + T / G + C is 0.3. What is the A + G / T + C ratio of the entire DNA molecule?

(a) 0.3  
(b) 0.6  
(c) 1.2  
(d) 1

24. Chemically, RNA is (i) reactive and (ii) stable as compared to DNA.

(a) (i) equally, (ii) equally  
(b) (i) less, (ii) more  
(c) (i) more, (ii) less  
(d) (i) more, (ii) equally

25. Given diagram represents the components of a transcription unit. Select the correct answer regarding it.

![transcription unit diagram](image)

- Transcription start site
- 3' to 5'
- 5' to 3'
- D
- C
- B
- A

26. In transcription in eukaryotes, heterogeneous nuclear RNA (hnRNA) is transcribed by

(a) RNA polymerase I  
(b) RNA polymerase II  
(c) RNA polymerase III  
(d) all of these

27. What would happen if in a gene encoding a polypeptide of 50 amino acids, 25th codon (UAU) is mutated to UAA?

(a) A polypeptide of 24 amino acids will be formed.  
(b) Two polypeptides of 24 and 25 amino acids will be formed.  
(c) A polypeptide of 49 amino acids will be formed.  
(d) A polypeptide of 25 amino acids will be formed.

28. Regulation of gene expression occurs at the level of

(a) transcription  
(b) processing/splicing  
(c) translation  
(d) all of these

29. Find out the wrong sentence about heterochromatin.

(a) It is densely packed  
(b) It stains dark  
(c) It is transcriptionally active  
(d) It is late replicating

30. Other than DNA polymerase, which are the enzymes involved in DNA synthesis?

(a) topoisomerase  
(b) helicase  
(c) RNA primase  
(d) all of these

31. What does “lac” refer to in what we call the lac operon?

(a) The number 1,000,000  
(b) Lactose  
(c) Lactase  
(d) Lac insect

32. The error rate of changing an incorrect base with another incorrect base during proofreading is

(a) 1 in 10 bases  
(b) 1 in 100 bases  
(c) 1 in 1,000 bases  
(d) 1 in 10,000 bases

**Response Grid**

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**Space for Rough Work**
33. DNA fingerprinting refers to
(a) molecular analysis of profiles of DNA samples
(b) analysis of DNA samples using imprinting devices
(c) techniques used for molecular analysis of different specimens of DNA
(d) techniques used for identification of fingerprints of individuals

34. In negative operon
(a) co-repressor binds with repressor
(b) co-repressor does not bind with repressor
(c) co-repressor binds with inducer
(d) cAMP have negative effect on lac operon

35. Genes that are involved in turning on or off the transcription of a set of structural genes are called
(a) Operator genes
(b) Redundant genes
(c) Regulator genes
(d) Polymorphic genes

36. If the gene encoding the lac repressor is mutated so that it can no longer bind the operator, will transcription of that operon occur?
(a) Yes, but only when lactose is present.
(b) No, because RNA polymerase is need to transcribe the genes.
(c) Yes, because the operator will not be bound by repressor and RNA polymerase can transcribe the lac operon.
(d) No, because cAMP levels are low when the repressor is nonfunctional.

37. Transcriptional regulation in prokaryotes can occur by
(a) a repressor binding an operator and preventing transcription.
(b) an activator binding upstream from a promoter and positively affecting transcription.
(c) different promoter sequences binding RNA polymerase more tightly, resulting in more effective transcriptional initiation.
(d) All of the above

38. Process used for amplification or multiplication of DNA for fingerprinting is
(a) polymerase chain reaction
(b) nesslerisation
(c) southern blotting
(d) northern blotting

39. Lactose operon produces enzymes
(a) β-galactosidase, permease and glycogen synthetase.
(b) β-galactosidase, permease and transacetylase.
(c) Permease, glycogen synthetase and transacetylase.
(d) β-galactosidase, permease and phosphoglucone isomerase.

40. Satellite DNA
(a) is classified in many categories such as micro-satellites, minisatellites, etc. on the basis of base composition length of segments and number of repetitive units.
(b) normally does not code for any protein.
(c) shows polymorphism.
(d) forms the basis of DNA fingerprinting.

41. In prokaryotes, gene regulation occurs at the level of
(a) transcription
(b) translation
(c) post-transcription
(d) post-translation

42. The regulation of tryptophan synthesis in E. coli is an example of affecting gene expression through
(a) translational control.
(b) transcriptional control.
(c) homeotic gene control.
(d) breaking down mRNA molecules.

43. Transcription in prokaryotic cell is:
(a) initiated at a promoter using one of three RNA polymerases (RNA polymerase II).
(b) initiated at a start codon with the help of initiation factors and the small subunit of the ribosome.
(c) initiated at a promoter and uses only one strand of DNA, the template strand, to synthesize a complementary RNA strand.
(d) is terminated at stop codons.

44. DNA replication is an ______ process and ______ energy.
(a) exergonic; does not require
(b) endothermic; does require
(c) endergonic; does require
(d) endothermic; does not require

45. Which one of the following triplet codes, is correctly matched with its specificity for an amino acid in protein synthesis or as ‘start’ or ‘stop’ codons?
(a) UAC – Tyrosine
(b) UCG – Start
(c) UUU – Stop
(d) UGU – Leucine

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**DAILY PRACTICE PROBLEM DPP CHAPTERWISE 28 - BIOLOGY**

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Success Gap = Net Score – Qualifying Score

Net Score = (Correct × 4) – (Incorrect × 1)
In chlorophyceae, sexual reproduction takes place by all the members of pteridophytes but absent in mosses as the plant body is sporophyte which is distinguished into true root, stem and leaves.

The leaves appear green because of the pigment chlorophyll in Cyanophyceae, reserve food is cyanophycean starch.

In chlorophyceae, sexual reproduction takes place by all the members of pteridophytes but absent in mosses as the plant body is sporophyte which is distinguished into true root, stem and leaves.

The leaves appear green because of the pigment chlorophyll which does not absorb green light rather reflects it back.

In chlorophyceae, sexual reproduction takes place by all the three processes: Isogamy – fusion of morphologically and physiologically similar gametes. Anisogamy – morphologically similar but physiologically dissimilar gametes. Oogamy – fusing gametes are dissimilar in all respect.

Azolla has been used as a green manure crop in Vietnam and China for centuries. The ability of Azolla to shade out weeds in wetland rice and taro has been noted by farmers and researchers since the early 20th century.

Rafflesia or Corpse flower is a total root parasite. It obtains its nourishment from the root of the host plant. Its flowers only come out of the host plant and they have a diameter of 1 m and weight around 10 kg.

Laminaria (kelp) and Fucus (rock weed) are marine algae. They are the members of class- phaeophyceae (brown) algae.

Algae Spirulina is one of the richest sources of protein, containing 40–50 percent crude protein on dry weight basis which under favourable condition may reach upto 70 percent. So, the people recovering from long illness are advised to take it in the diet.

The membrane surrounding a lysosome allows the digestive enzymes to work at the 4.5 pH they require. They are created by the addition of hydrolytic enzymes to early endosomes from the Golgi apparatus.

Riccia is liverwort in which simplest sporophyte consists of capsule only while Polytrichum is moss in which sporophyte consists of foot, seta & capsule. Volvox is a fresh water green colonial alga. Reproduction is both sexual and asexual. Sexual reproduction is oogamous. Slime moulds are consumer decomposer protists. They possess characters of plants (cellulosic cell wall), animals (phagotrophic nutrition) and fungi (spores).

Gametophyte of bryophytes bears protonemal & leafy stage. In gymnosperm female gametophyte is not free living. They are present in Marchantia or which is a bryophyte. Origin of seed habit started in pteridophyte Selaginella.

Prothallus of pteridophytes is free-living, mostly photosynthetic small but multicellular and inconspicuous.

Psilopsida – Psilotum – rootless
Sphenopsida – Equisetum – Stroblus
Lycopsida – Lycopodium – Homosporous
Lycopsida – Selaginella – Heterosporous

Angiosperms are highly evolved and well adapted land plants. They have both vessels and tracheids in xylem for better conduction of water. Roots are modified into tap roots, adventitious roots, pneumatophores etc. to suit the desired climate.

Sex organs are highly developed, sporocytes are organised into flowers and the flowers are highly coloured or modified to attract pollinators at different times and places. Insect pollination is more prevalent because it is more efficient and leads to less wastage of pollen grains as compared to wind pollination. So the flowers are made attractive to attract a variety of insects. Seed are more protected as they are enclosed inside a fruit.

All these adaptations have made angiosperms more adaptive in diverse habitats.

Tracheophyta are those plants which possess conducting or vascular tissue, xylem and phloem. Xylem transports water and minerals while phloem conducts organic food. Tracheophytes include pteridophytes, gymnosperms and angiosperms.

Nearly 50% of total carbon dioxide fixation of photosynthetic world is carried out by algae. Photosynthesis by algae releases oxygen in the immediate aquatic environment. It is essential for respiration of aquatic life. Algae are primary producers of food in large bodies of fresh, brackish and sea water.

In bryophytes, the zygote develops into a multicellular, undifferentiated structure called embryo. The embryo, within venter of archegonium, by further segmentation and differentiation finally develops into a full fledged sporophyte called sporogonium.

The gymnosperms are comparatively more ancient than the angiosperms in evolutionary terms. Most of the gymnosperms have now become extinct and the group is presently represented by only 900 living species. The living gymnosperms are widely distributed in the cold climates where snow is the source of water. Cycas and Ginkgo are referred to as living fossils.

In gymnosperms, pteridophytes and angiosperms, the sporophytic phase is dominant and the gametophytic phase is dependent on sporophyte.

In diploctine life cycle, the dominant free living phase is the diploid (2n). Sporophyte is photosynthetic. The gametophytic phase is represented by single to few-celled haploid gametophyte e.g., all seed-bearing plants i.e., gymnosperms and angiosperms.

Algae and fungi are grouped under thallophyta. Bryophytes are non vascular embryophytes having an independent gametophyte and parasitic sporophyte.

Angiosperms have adapted themselves to all kinds of habitat-terrestrial, aquatic, tropical, deciduous and alpine. Self pollination is seen in very few angiosperms. Production of
large number of seeds ensure that at least some will germinate. Not all plants have been domesticated by man.

39. (d) Blue-green algae which grow in hot water springs (at about 70°C) are *Oscillatoria terebriformis*, *Oscillatoria brevis* etc. These blue-green algae are also called thermophytes. The temperature tolerance of these algae is due to the presence of homopolar bonds in their proteins.

40. (b) *Cladophora* is an autotrophic and filamentous algae which occurs in fresh as well as in marine water.

41. (a) The pyrenoids are small spherical protein bodies surrounded by starch deposition. They are found singly or in numbers embedded in the chloroplast of many algae and bryophytes.

42. (e) Phycocyanin pigment is found in blue-green algae (myxophycean algae). The reserve food material is in the form of cyanophycean starch.

43. (c) *Cephaleuros virescens* grows as a parasite on the leaves of tea and causes red rust of tea. It is the common intercellular parasitic algae of chlorophyceae.

44. (b)

45. (b)
1. (d) rRNA occurs inside ribosomes. m RNA brings information from DNA to polypeptides. hnRNA are heterogenous nuclear RNA.

2. (d) (a) Helicase also known as unwindase, these enzymes separate the two strands of DNA. (b) Topoisomerases : Tension produced by unwinding of DNA strands is reduced by these enzymes. (c) RNA Primase : This is an RNA polymerase, which helps in the synthesis of a small fragment of RNA called primer.

3. (a) DNA ligase is the enzyme which helps in joining two fragments of DNA. The enzyme is used in DNA replication as it joins the Okazaki segments (also in proof reading). It also finds its use in genetic engineering as it can join two or more desired nucleotide sequences of DNA.

4. (a) In 1953 Wilkins obtained very fine X-ray crystallographic pictures of DNA from which Watson and Crick developed the double helix model of DNA.

5. (c) Okazaki fragments in DNA are linked up by the enzyme DNA ligase. Replication always occurs in 5' - 3' direction. Okazaki fragments synthesized on 3' - 5' DNA template, join to form lagging strand which grows in 3' - 5' direction.

6. (d) The phenomenon of making DNA over RNA genome through enzyme reverse transcriptase is called reverse transcription or teminism.

7. (c) Telomerase is a ribonucleoprotein which synthesizes the rich strand of telomers in DNA. Telomerase is an enzyme that adds specific DNA sequence repeats (“TTAGGG” in all vertebrates) to the 3’ (“three prime”) end of DNA strands in the telomere regions, which are found at the ends of eukaryotic chromosomes. The telomeres contain condensed DNA material, giving stability to the chromosomes. The enzyme is a reverse transcriptase that carries its own RNA molecule, which is used as a template when it elongates telomeres, which are shortened after each replication cycle. Telomerase was discovered by Carol W. Greider in 1984.

8. (b) During transcription, from the DNA template, complementary mRNA is formed and thymine is replaced by uracil.

9. (d) Replication begins at the Ori - origin of replication and proceeds on both sides from the Ori. Unidirectional replication is rare. RNA primers are involved in both prokaryote and eukaryote.

10. (c) During the process of replication the enzyme that helps to cut one strand of DNA duplex to release the tension of coiling of two strands is topoisomerase.

11. (c) It was given by Geneticists George W. Beadle and E. L. Tatum which states that each gene in an organism controls the production of a specific enzyme. It is these enzymes that catalyze the reactions that lead to the phenotype of the organism.

12. (d) The transforming chemical discovered by Griffith in his experiments with Pneumococcus, was confirmed as DNA by Avery, McLeod and McCarty.

13. (b) The transforming chemical discovered by Griffith in his experiments with Pneumococcus, was confirmed as DNA by Avery, McLeod and McCarty.

14. (a) Statement (i) and (iv) are / is correct

15. (a) Statement of lac operon by repressor is referred to as negative regulation. In negative regulation, a repressor molecule binds to the operator of an operon and terminates transcription. In positive regulation, an activator interacts with the RNA polymerase in the promoter region to initiate transcription. Human genome contains some 20,000-25,000 billion gene bases.

16. (a) In negative (repressible) operon, the repressor co-repressor complex binds with the operator. The free repressor cannot bind to the operator.

17. (b) In eukaryotes, DNA organization is complex. There is a set of positively charged, basic proteins called histones. Histones are rich in the basic amino acid residues lysine and arginine. There are five types of histone proteins – H1, H2A, H2B, H3 and H4. Four of them (H2A, H2B, H3 and H4) produce histone octamer called nu body or core of nucleosome. The negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome. DNA connecting two adjacent nucleosomes is called linker DNA which bears H1 histone proteins.

18. (a) Transformation is a phenomenon by which DNA isolated from one type of cell when introduced into another type is able to give some of its properties to the latter. In 1944, Avery, McCarty and MacLeod discovered that protein-digesting enzymes (proteases) and RNA-digesting enzymes (RNSace) did not affect transformation, so the transforming substance was not a protein or RNA. Digestion with DNase did inhibit transformation, suggestion that the DNA caused did inhibit transformation, suggesting that the DNA caused the transformation. They concluded that DNA is the hereditary material.

19. (c) Transformation is a phenomenon by which DNA isolated from one type of cell when introduced into another type is able to give some of its properties to the latter. In 1944, Avery, McCarty and MacLeod discovered that protein-digesting enzymes (proteases) and RNA-digesting enzymes (RNSace) did not affect transformation, so the transforming substance was not a protein or RNA. Digestion with DNase did inhibit transformation, suggestion that the DNA caused did inhibit transformation, suggesting that the DNA caused the transformation. They concluded that DNA is the hereditary material.

20. (d) Synthesis in DNA by DNA polymerases occurs only in 5' → 3' direction. One strand called leading strand, is copied in the same direction as the unwinding helix. The other strand is known as the lagging strand. Replication of lagging strand is in a discontinuous way, synthesizing short segments of DNA which are always in the 5' → 3' direction. These short segments are called Okazaki fragments joined together by the action of DNA ligase.

21. (d) In the RNA, there is a T/P/C loop which contains pseudouridine and ribothymidine. The loop is the site for attaching to ribosomes. Another loop, DHU loop contains dihydrouridine. It is binding site for aminocacyl synthetase enzyme. tRNA molecules have unpaired (single stranded) CCA–OH sequence at the 3’ end. This is called amino acid attachment site, because the amino acid becomes covalently attached to adenylac acid or A of CCA sequence during polypeptide synthesis. Anticodon loop is made up of three nitrogen bases for recognising and attaching to the codon of mRNA.

22. (b) Anticodon loop is made up of three nitrogen bases for recognising and attaching to the codon of mRNA.
unstable, RNA mutates at a much faster rate and there is no repairing system. That is why RNA viruses have shorter life span. They mutate and evolve very fast.

25. (c) The segment of DNA that takes part in transcription is called transcription unit. It has three components (i) a promoter, (ii) the structural gene and (iii) a terminator. Besides a promoter, eukaryotes also require an enhancer. Promoter is located upstream of structural gene. It is called 5’ end of the coding strand which is 3’ end of template strand. Terminator region is present downstream of structural gene at the 3’ end of coding strand which if actually 5’ end of the template strand. Promoter has different parts for attachment to various transcription factors. In many cases, the promoter has an AT rich region called TATA box. The area has a groove to which specific protein components can combine. TATA containing region is also called Pribnow box.

26. (b) Eukaryotes have three RNA polymerases. RNA polymerase I is located in the nucleolus and transcribes for rRNAs (28s, 18s and 5.8S), RNA polymerase II is localized in the nucleoplasm and used for hnRNA, mRNA and RNA polymerase III is localized in the nucleus, possibly the nucleolar-nucleoplasm interface and transcribes for tRNA, 5s RNA and snRNAs.

27. (a) UAA is a nonsense codon. It signals for polypeptide chain termination. Hence, only 24 amino acids chain will be formed.

28. (d) Regulation of gene expression can be exerted at four levels: (i) Transcriptional level during formation of primary transcript. (ii) Processing like splicing, terminal additions or modifications (iii) Transport of RNAs from nucleus to cytoplasm and (iv) Translational level

29. (c) A typical nucleosome contains 200 bp of DNA helix. Nucleosomes constitute the repeating unit of a structure in nucleus called chromatin. Chromatin is held over a scaffold of non histone chromosomal (or NHC) proteins. At some places chromatin is densely packed to form darkly stained heterochromatin. At other places chromatin is loosely packed. It is called euchromatin. It is transcriptionally active and late replicating or heteropycnotic.

30. (d) Process of DNA synthesis where by a parent DNA molecule is faithfully copied, giving rise to two identical daughter molecules is called DNA replication. In DNA synthesis, DNA polymerase plays important role having the capability to elongate an existing DNA strand but cannot initiate the synthesis. So, the synthesis is initiated with the help of RNA primer formed by RNA primase. RNA primase synthesizes the short primer RNA of about 10 nucleotides that is elongated by DNA polymerase to form an okazaki fragment of DNA during DNA replication. Helicase unzips the two strands of DNA and topoisomerase reduces the coiling tension developed due to the unwinding of the two strands.

31. (b) Lactose operon in E.coli is a catabolic pathway in which the structural genes remain switched off unless the inducer (Lactose) is present in the medium.

32. (d) DNA fingerprinting is the technique of determining nucleotide sequences of certain areas of DNA which are unique to each individual. DNA contains non cistronic hypervariable repeat sequences called VNTR. DNA fingerprinting involves the identification of these VNTRs.

33. (a) In negative (repressible) operon, the repressor co-repressor complex binds with the operator. The free repressor cannot bind to the operator.

34. (a) Operator gene allows the functioning of the operon.

35. (a) If the lac repressor is non functional, it cannot bind the operator site and transcription of the lac operon will occur at all times, whether or not lactose is present.

36. (c) Option a refers to the lac and trp repressors, option b to the CRP protein, and option c refers to promoter that have different transcriptional efficiencies.

38. (a) 39. (b) 40. (b) 41. (a)

42. (b) The presence or absence of tryptophan determines whether the genes that code the necessary enzymes in tryptophan synthesis will even be transcribed.

43. (e) Option (a) describes transcription in eukaryotic cells; Option (b) describes translation.

44. (c) DNA replication is an energy-consuming process that must have an input of energy to proceed. Energy is provided in the breaking of the triphosphate tails of each nucleotide.

45. (a) AUG is initiating codon. UCG codes for serine, UUU codes for phenylalanine, UGU codes for cysteine.
DIRECTIONS (Q.1-Q.30) : There are 30 multiple choice questions. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE choice is correct.

1. Radial symmetry occurs in
   (a) fishes   (b) molluscs
   (c) coelenterata   (d) sponges

2. Level of organisation in sponges is
   (a) cellular level   (b) acellular level
   (c) tissue level   (d) organ-system level

3. Sponges and coelenterates resemble each other in being
   (a) monoblastic and acoelomate
   (b) diploblastic and acoelomate
   (c) triploblastic and acoelomate
   (d) triploblastic and pseudocoelomate

4. Evolution of porifera from protozoan is evidenced by the animals like
   (a) *Euglena*
   (b) *Chlamydomonas*
   (c) *Volvox*
   (d) *Paramecium*
5. In sponges, free swimming larva is called as
   (a) veliger   (b) trochophore
   (c) parenchymula  (d) bipinnaria

6. Water currents in *Leucosolenia* are produced by
   (a) choanocytes   (b) pinacocytes
   (c) archaeocytes  (d) thesocytes

7. The common bath sponge belongs to the genus
   (a) *Sycon*  (b) *Leucosolenia*
   (c) *Euspongia*  (d) *Spongilla*

8. Path of water in a sponge is
   (a) Dermal ostia → Gastral ostia → Osculum.
   (b) Dermal ostia → Gastral ostia → Spongocoel → Osculum.
   (c) Osculum → Spongocoel → Choanocytes → Ostia.
   (d) Pinacocytes → Choanocytes → Enteron → Osculum.

9. Choanocytes in ascon-type of canal system form lining of
   (a) spongocoel  (b) porocyte
   (c) apopyle     (d) incurrent canal

10. Which of the following are 'multicellular grade' organisms?
    (a) Sponges  (b) Coelenterates
    (c) Prokaryotes  (d) Vertebrates

11. *Sycon* belongs to a group of animals which are best described as
    (a) Unicellular or acellular.
    (b) Multicellular without any tissue organisation.
    (c) Multicellular with a gastrovascular cavity.
    (d) Multicellular having tissue organisation, but no body cavity.

12. Which is not applicable to coelenterata?
    (a) Coelenteron
    (b) Choanocytes
    (c) Nematocyst
    (d) Radial symmetry

13. Budding is a normal mode of asexual reproduction in
    (a) starfish and *Hydra*
    (b) *Hydra* and sponges
    (c) tapeworm and *Hydra*
    (d) sponges and starfish

14. Nematocysts take part in
    (a) locomotion     (b) offence and defence
    (c) food capture   (d) all of the above
15. *Hydra* is
   (a) triploblastic, radial symmetry and acoelomate.
   (b) triploblastic, radial symmetry and coelomate.
   (c) diploblastic, radial symmetry and acoelomate.
   (d) diploblastic, radial symmetry and coelomate.

16. Which one of the following is an example of platyhelminthes?
   (a) *Trypanosoma*  (b) *Schistosoma*
   (c) *Plasmodium*  (d) *Wuchereria*

17. The excretory organs of flatworms are
   (a) flame cells  (b) nephridia
   (c) malpighian tubules  (d) rennate glands

18. What is correct about *Taenia*?
   (a) Male organs occur in posterior proglottides.
   (b) Male organs occur in anterior proglottides.
   (c) Female organs occur in anterior proglottides.
   (d) Mature proglottides contain both male and female organs.

19. Secondary host of *Taenia solium* is
   (a) cow  (b) sheep
   (c) pig  (d) man

20. *Fasciola hepatica* lives in
   (a) liver of sheep  (b) blood of sheep
   (c) intestine of sheep  (d) spleen of sheep

21. Bilaterally symmetrical but acoelomate animal is
   (a) liver fluke  (b) jelly fish
   (c) round worms  (d) crab

22. "Triploblastic, unsegmented, acoelomate exhibiting bilateral symmetry and reproducing both asexually and sexually with parasitic forms." The above description is the characteristic of phylum
   (a) platyhelminthes  (b) annelida
   (c) ctenophora  (d) cnidaria

23. Which of the following groups have one or more animals which are not pseudocoelomate?
   (a) *Bipalium, Taenia*
   (b) *Enterobius, Wuchereria*
   (c) *Ancylostoma, Dracunculus*
   (d) *Ascaris, Ancylostoma*

24. The adult *Wuchereria bancrofti* lives in
   (a) human sub dermal spaces
   (b) muscles of *Culex*
   (c) salivary glands of *Culex*
   (d) human lymph glands
25. Coelom in *Ascaris lumbricoides* is called as
   (a) pseudocoelom   (b) true coelom
   (c) schizocoelom   (d) none of these

26. In humans, elephantiasis is caused by
   (a) *Ascaris lumbricoides*
   (b) *Dracunculus medinensis*
   (c) *Wuchereria bancrofti*
   (d) *Ancylostoma duodenale*

27. Differentiating trait of *Ascaris* is
   (a) sexual dimorphism and rhabditiform larva
   (b) unisexual and digenetic parasite
   (c) pseudocoelom and metameric segmentation
   (d) hermaphrodite and pseudocoelom

28. Pseudocoelom develop from
   (a) blastopore lip   (b) archenteron
   (c) embryonic mesoderm   (d) blastocoel

29. In nemathelminthes which coelom is not lined by peritoneum?
   (a) Acoelom   (b) Pseudocoelom
   (c) Enterocoelom   (d) Haemocoel

30. Choose the correct statement with reference to *Ascaris*?
   (a) Hatching of embryos takes place in the stomach due to lytic enzyme.
   (b) Adulthood is reached inside the body of the host in ten days time.
   (c) Development and moulting takes place in the alveoli of lungs.
   (d) Hatching of embryo takes places within ten hours.

**Response Grid**

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**DAILY PRACTICE PROBLEM SHEET 9 - BIOLOGY**

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Success Gap = Net Score – Qualifying Score

Net Score = (Correct × 4) – (Incorrect × 1)
BIOLOGY

SYLLABUS: Principles of inheritance and variation-Part I: Mendelism, Interaction of gene, Cytoplasmic inheritance, Linkage and Crossing over

Max. Marks: 120  Time: 60 min.

GENERAL INSTRUCTIONS

- The Daily Practice Problem Sheet contains 30 MCQ's. For each question only one option is correct. Darken the correct circle/bubble in the Response Grid provided on each page.
- You have to evaluate your Response Grids yourself with the help of solution booklet.
- Each correct answer will get you 4 marks and 1 mark shall be deducted for each incorrect answer. No mark will be given/deducted if no bubble is filled. Keep a timer in front of you and stop immediately at the end of 60 min.
- The sheet follows a particular syllabus. Do not attempt the sheet before you have completed your preparation for that syllabus. Refer syllabus sheet in the starting of the book for the syllabus of all the DPP sheets.
- After completing the sheet check your answers with the solution booklet and complete the Result Grid. Finally spend time to analyse your performance and revise the areas which emerge out as weak in your evaluation.

DIRECTIONS (Q.1-Q.30): There are 30 multiple choice questions. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE choice is correct.

1. The branch of botany dealing with heredity and variation is called?
   (a) geobotany  (b) sericulture
   (c) genetics  (d) evolution

2. Mendel proposed which of the following term for hereditary units?
   (a) Factor (Determiner)  (b) Genome
   (c) Genetic particle  (d) None of these

3. In 1900 A.D. three biologists independently discovered Mendel's principles. They are
   (a) De Vries, Correns and Tschermak.
   (b) Sutton, Morgan and Bridges.
   (c) Avery, McLeod and McCarthy.
   (d) Bateson, Punnet and Bridgess.

4. Which of the following Mendel has selected for his experiment?
   (a) Garden pea  (b) Pigeon pea
   (c) Sweet pea  (d) Moong

RESPONSE GRID

1. 2. 3. 4.

Space for Rough Work
5. If an offspring shows any one of the characters of either of parents, the
   (a) character is said to be hereditary.
   (b) offspring is hereditary.
   (c) the character is related with cytoplasm.
   (d) none of the above.

6. What is the correct sequence of the following events?
   1. Formation of the chromosome theory of heredity.
   2. Experiments which proved that DNA is the hereditary material.

   Code:
   (a) 1, 3 and 2  (b) 1, 2 and 3
   (c) 3, 1 and 2  (d) 2, 1 and 3

7. What type of gametes will form by genotype RrYy?
   (a) RY, Ry, rY, ry  (b) RY, Ry, ry, ry
   (c) Ry, Ry, Yy, ry  (d) Rr, RR, Yy, YY

8. The term ‘allelomorphic’ implies
   (a) any two characters.
   (b) a pair of contrasting characters.
   (c) sex linked characters.
   (d) a pair of non-contrasting characters.

9. The alleles are
   (a) a pair of genes governing a specific character such as tallness or dwarfess.
   (b) multiple forms of genes.
   (c) genes governing eye characters.
   (d) genes present in allosomes.

10. Organisms phenotypically similar but genotypically different are said to be
    (a) heterozygous
    (b) monozygous
    (c) multizygous
    (d) homozygous

11. When heterozygous tall plants are self-pollinated than tall and dwarf plants are obtained, this is an explanation to
    (a) law of purity of gamete.
    (b) segregation of law.
    (c) division in spores.
    (d) independent assortment.

12. Change of male and female parents during crosses is known as
    (a) back cross
    (b) test cross
    (c) reciprocal cross
    (d) monohybrid cross

13. In $F_2$ generation, a phenotypic ratio of 1:1:1:1 exhibits
    (a) back cross
    (b) monohybrid test cross
    (c) lethality
    (d) dihybrid test cross

14. Which of the statement is correct?
    (a) Each back cross is a test cross.
    (b) Each test cross is a back cross.
    (c) Both tests have the same meaning.
    (d) Reappearance of similar characters in a test cross is called a back cross.
15. Mendel crossed a pure white-flowered recessive pea plant with a dominant pure red-flowered plant. The first generation of hybrids from the cross should show
   (a) 50% white-flowered and 50% red-flowered plants.
   (b) All red-flowered plants.
   (c) 75% red-flowered and 25% white-flowered plants.
   (d) All white-flowered plants.

16. If in a dihybrid cross Mendel had used two such characters which are linked, he would have faced difficulty in explaining the results on the basis of his
   (a) Law of segregation.
   (b) Law of multiple factor hypothesis.
   (c) Law of independent assortment.
   (d) Law of dominance.

17. A farmer crossed a walnut combed chicken with a single combed one and obtained all walnut combed chickens in F₁.
   The genotype of the parents was
   (a) Rr Pp × rr pp
   (b) RR PP × rr pp
   (c) RR pp × rr pp
   (d) RR Pp × rr pp

18. In sweet pea plants the presence of dominant C and P genes is essential for development of purple colour. The ratio of plants producing flowers of different colours in the progeny of the cross Cc Pp × Cc pp will be
   (a) 2 white and 6 purple coloured flowers.
   (b) 2 purple and 6 white coloured flowers.
   (c) 3 white and 5 purple coloured flowers.
   (d) 3 purple and 5 white coloured flowers.

19. From a single ear of corn, a farmer planted 200 kernels which produced 140 tall and 40 dwarf plants. The genotype of these offsprings are most likely
   (a) TT, Tt and tt
   (b) TT and tts
   (c) TT and Tt
   (d) Tt and tt

20. While experimenting with the factor of tallness in *Pisum sativum*, Mendel obtained the results 73.97% tall and 26.03% dwarf from one of the cross. This shows that the parents are
   (a) hybrid tall and pure dwarf plant.
   (b) hybrid tall and pure tall plant.
   (c) hybrid tall and hybrid tall plant.
   (d) pure tall and pure dwarf plant.

21. The genotypes of a plant variety were TtHh, Tthh, ttHh and thh, where T = tallness and H = hairy stem. Which one of the following crosses would produce progeny giving a phenotypic ratio approximately 1 : 1 : 1 : 1?
   (a) TtHh × TtHh
   (b) TtHh × Tthh
   (c) TtHh × ttHh
   (d) TtHh × thh

22. A self-fertilizing trihybrid plant forms
   (a) 8 different gametes and 16 different zygotes.
   (b) 8 different gametes and 32 different zygotes.
   (c) 8 different gametes and 64 different zygotes.
   (d) 4 different gametes and 16 different zygotes.

23. Pure tall plants are crossed with pure dwarf plants. In the F₁ generation all plants were tall. These tall plants of F₁ generation were selfed and the ratio of tall to dwarf plants obtained was 3 : 1. This is called
   (a) Dominance
   (b) Inheritance
   (c) Co-dominance
   (d) Heredity

24. Mendel’s law of segregation is applicable to
   (a) dihybrid cross only.
   (b) monohybrid cross only.
   (c) both dihybrid and monohybrid cross.
   (d) dihybrid but not monohybrid.
25. What will be the ratio in F2 generation if red flowered variety of *Mirabilis jalapa* is crossed with white flowered variety?
(a) 1 : 1 : 1 : 1  (b) 1 : 2 : 1  
(c) 2 : 1  (d) 3 : 1  

26. Kappa particles indicate
(a) nuclear inheritance
(b) cytoplasmic inheritance
(c) mutation  
(d) nucleo-cytoplasmic inheritance

27. Cytoplasmic male sterility in maize is manifestation of interaction between
(a) chloroplast and nuclear genes.  
(b) mitochondrial and nuclear genes.  
(c) chloroplast and mitochondrial genes.  
(d) cytoplasmic factors and male sterile genes.

28. Grain colour in wheat is determined by three pairs of polygenes. Following the cross AABBCC (dark colour) × aabbcc (light colour), in F2 generation what proportion of the progeny likely to resemble either parent?
(a) None  
(b) Less than 5 per cent  
(c) One third  
(d) Half

29. The evidence for crossing over which occurs at four stranded stage and not at two stranded stage of the chromosomes, comes from
(a) 2 : 2 : 2 : 2 arrangement of ascospores in *Neurospora*.  
(b) 4 : 4 arrangement of ascospores in *Neurospora*.  
(c) Studies of meiosis in maize.  
(d) Studies on linkage maps of chromosomes in *Drosophila*.

30. The percentage of crossing over will be more if
(a) linked genes are located far apart from each other  
(b) linked genes are located close to each other  
(c) genes are not linked  
(d) genes are located in a different cell

### RESPONSE GRID

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### DAILY PRACTICE PROBLEM SHEET 46 - BIOLOGY

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Success Gap = Net Score – Qualifying Score

Net Score = (Correct × 4) – (Incorrect × 1)
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