DPP - Daily Practice Problems

Date : | **Start Time :** | **End Time :**

BIOLOGY CB08

SYLLABUS : Cell: The Unit of Life

Max. Marks : 180 **Marking Scheme :** + 4 for correct & (–1) for incorrect **Time : 60 min.**

INSTRUCTIONS : This Daily Practice Problem Sheet contains 45 MCQs. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

1. The cell organelle involved in glycosylation of protein is
(a) ribosome
(b) peroxisome
(c) endoplasmic reticulum
(d) mitochondria

2. The outer layer of vacuole is called
(a) cell wall (b) tonoplast
(c) plasmalayer (d) leucoplast

3. Which of the following cell organelle remains enveloped by a single unit membrane?
(a) Mitochondria (b) Lysosomes
(c) Nucleus (d) Chloroplast

4. Choose the correct option.
(i) Lysosomes are double membranous vesicles budded off from Golgi apparatus and contain digestive enzymes.
(ii) Endoplasmic reticulum consists of a network of membranous tubule and helps in transport, synthesis and secretion.
(iii) Leucoplasts are bound by two membranes, lack pigment but contain their own DNA and protein synthesising machinery.
(iv) Sphaerosomes are single membrane bound organelle which are associated with synthesis and storage of lipids.
(a) (i) only (b) (i) and (ii)
(c) (ii), (iii) and (iv) (d) All of these

5. The nucleolus is the site of formation of
(a) spindle fibres (b) chromosomes
(c) ribosomes (d) peroxisomes

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ	5. ⓐⓑⓒⓓ

6. Which one of the following combination is mismatched?
(a) Glycocalyx - may be capsule or slime layer
(b) Pili - Reproduction
(c) Cell wall - Protective, determines shape, prevents from bursting
(d) Flagella, Pili and Fimbriae - Surface structures of bacterial cell

7. The fluidity of membranes in a plant in cold weather may be maintained by
(a) increasing the number of phospholipids with unsaturated hydrocarbon tails
(b) increasing the proportion of integral proteins
(c) increasing concentration of cholesterol in membrane
(d) increasing the number of phospholipids with saturated hydrocarbon tail

8. The cell as a basic unit of structure of living beings was discovered by
(a) Aristotle
(b) Robert Hooke
(c) Schleiden and Schwann
(d) Gregore Mendel

9. Which pair of structures are usually found in both plant and animal cells?
(a) Cell membrane and nucleolus
(b) Cell membrane and cell wall
(c) Nucleolus and chloroplast
(d) Nucleus and cell wall

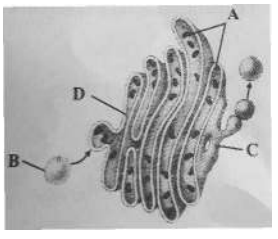
10. Most abundant lipid in the cell membrane is
(a) cholesterol (b) phospholipids
(b) glycolipids (d) cerebrosides

11. If you remove the fimbriae from the bacterial cell, which of the following would you expect to happen?
(a) The bacteria could no longer swim
(b) The bacteria would not adhere to the host tissue
(c) Transportation of molecules across the membrane would stop
(d) The shape of bacteria would change

12. Cell recognition and adhesion are facilitated by components of plasma membrane. These components are generally
(a) protein molecules alone
(b) lipids alone
(c) both lipids and proteins
(d) glycolipids and glycoproteins

13. Smooth endoplasmic reticulum is well developed in the cells which synthesize
(a) steorids (b) proteins
(c) carbohydrates (d) all of these.

14. Select the option with correct labelling of given structure of Golgi apparatus.



	A	B	C	D
(a)	Cisternae	Vesicle	*trans* face	*cis* face
(b)	Cisternae	Vesicle	*cis* face	*trans* face
(c)	Vesicle	Cisternae	*cis* face	*trans* face
(d)	Tubules	Vesicle	*trans* face	*cis* face

15. The molecules in the membrane that limit its permeability are the
(a) carbohydrates (b) phospholipids
(c) proteins (d) water

16. pH of vacuolar cell sap is
(a) neutral and isotonic.
(b) alkaline and isotonic.
(c) acidic and hypertonic.
(d) equal to cytoplasm and isotonic.

17. All plastids have essentially the same structure because
(a) they have to perform the same function
(b) they are localised in the aerial parts of plants

RESPONSE GRID					
	6. ⓐⓑⓒⓓ	**7.** ⓐⓑⓒⓓ	**8.** ⓐⓑⓒⓓ	**9.** ⓐⓑⓒⓓ	**10.** ⓐⓑⓒⓓ
	11. ⓐⓑⓒⓓ	**12.** ⓐⓑⓒⓓ	**13.** ⓐⓑⓒⓓ	**14.** ⓐⓑⓒⓓ	**15.** ⓐⓑⓒⓓ
	16. ⓐⓑⓒⓓ				

(c) one type of plastids can differentiate into another type of plastids depending upon the cell requirements
(d) all plastids have to store starch, lipids and proteins

18. A Semi-autonomous organelle.
B Have linear DNA as well as RNA
C Carry out ATP synthesis.
D Have quantasomes embedded in thylakoid membrane
E. Occurs in all photosynthetic organisms.
Find the correct number of statements w.r.t. plastids.
(a) One (b) Two
(c) Three (d) Four

19. Select incorrect matching
(a) Elaioplasts - Oils
(b) Chromoplasts - Fat soluble anthocyanin pigments
(c) Mitochondria - Fission in G_2 phase
(d) Contractile vacuole - Excretion

20. Quasi-fluid nature of membrane is due to
(a) Phospholipid (b) Integral protein
(c) Peripheral protein (d) Sugar moiety

21. Gas vacuole is present in
(a) Blue green algae
(b) Purple photosynthetic bacteria
(c) Green photosynthetic bacteria
(d) All of the above

22. Which of the following feature is not associated with centrosome?
(a) Pericentriolar material
(b) Two cylindrical structures
(c) Two centriole
(d) Lipid bilayer covering

23. What is the site of DNA and centriole duplication respectively?
(a) Nucleus, nucleus
(b) Nucleus, cytoplasm
(c) Cytoplasm, nucleus
(d) Nucleus, nucleolous

24. Cell wall
(a) Helps in cell to cell interaction
(b) Protects the cell from infection
(c) Contains minerals like calcium carbonate in certain algae
(d) All are correct

25. Read the following statements carefully and choose the correct options w.r.t. eukaryotic cell.
I. All eukaryotic cells are identical in structure
II. Mitochondria and plastids are semi-autonomous organelles
III. Ribosomes are associated with plasma membrane
IV. There is an extensive compartmentalization of cytoplasm through the presence of membrane bound organelles
(a) I & IV (b) II & IV
(c) I & III (d) II & III

26. Golgi bodies are involved in
(a) Recycling of broken plasma membrane during endocytosis
(b) Synthesis of glycolipids
(c) Modification of proteins
(d) All of the above

27. Which of the following organelles lack membrane in eukaryotic cell?
A. Cilia B. Lysosome
C. RER D. Ribosomes
E. Flagella F. Centrioles
(a) D & F (b) C & D
(c) A & D (d) A & E

28. Aleuroplasts, amyloplasts and elaioplasts
(a) Divide by multiple fission
(b) Store protein, starch and fat respectively
(c) Help in photolysis of water
(d) Store reserve food and pigments

29. Reformation of nucleolus, golgi complex and ER occurs in
(a) Telophase (b) Metaphase
(c) Prophase (d) Anaphase

30. Ribosomes of the cytoplasm, chloroplast and mitochondrion are respectively
(a) 80S, 80S and 70S (b) 80S, 70S and 70S
(c) 70S in all (d) 80S in all

31. Integral cell membrane proteins
(a) are partially embedded in lipid layers
(b) are completely embedded in lipid layers

RESPONSE GRID					
	17. (a)(b)(c)(d)	**18.** (a)(b)(c)(d)	**19.** (a)(b)(c)(d)	**20.** (a)(b)(c)(d)	**21.** (a)(b)(c)(d)
	22. (a)(b)(c)(d)	**23.** (a)(b)(c)(d)	**24.** (a)(b)(c)(d)	**25.** (a)(b)(c)(d)	**26.** (a)(b)(c)(d)
	27. (a)(b)(c)(d)	**28.** (a)(b)(c)(d)	**29.** (a)(b)(c)(d)	**30.** (a)(b)(c)(d)	

(c) show lateral but not vertical movements within bilayer of lipid
(d) All of these

32. Which group of organelles is involved in synthesis of substances needed by cell?
(a) Lysosome, vacuole, ribosome
(b) Vacuole, RER, SER
(c) Ribosome, RER, SER
(d) RER, lysosome, vacuole

33. Who gave the lamellar or sandwich model of cell membrane?
(a) Singer and Nicolson
(b) Danielle and Davson
(c) J. Robertson
(d) None of these

34. Microtubules are absent in
(a) mitochondria (b) flagella
(c) spindle fibres (d) centriole

35. Which of the following contributes to differences in the two sides of the cell membrane?
(a) Differences in peripheral proteins
(b) Different domains expressed on the ends of integral proteins
(c) Differences in phospholipid types
(d) All of the above

36. Which of the following cell membrane components serve as recognition signals for interactions between cells?
(a) Recognition proteins
(b) Glycolipids or glycoproteins
(c) Phospholipids
(d) Integral proteins

37. Channel proteins allow ions that would not normally pass through the cell membrane to go through the channel. What properties of the proteins are responsible for this?
(a) The channels are often composed of charged or polar R groups.
(b) The channels are often composed of hydrophobic R groups.
(c) a and b
(d) None of the above

38. Which of the following is present in both prokaryotes and eukaryotes?
(a) Lysosome (b) Vesicles
(c) Chloroplast (d) Plasma membrane

39. Both chloroplasts and mitochondria
(a) have multiple membranes.
(b) have highly structured innermost membranes.
(c) are found only in eukaryotic cells.
(d) All of the above

40. Microtubules, motor proteins, and actin filaments are all part of the
(a) mechanism of photosynthesis that occurs in chloroplasts.
(b) rough ER in prokaryotic cells.
(c) cytoskeleton of eukaryotic cells.
(d) process that moves small molecules across cell membranes.

41. The cell wall of both bacteria and cyanobacteria contains
(a) Lipid (b) Pectin
(c) Protein (d) Muramic acid

42. Mesosomes were taken as
(a) Golgi bodies (b) Plastids
(c) Mitochondria (d) Endoplasmic reticulum

43. Pit membrane of simple pit is formed by :
(a) Secondary cell wall (b) Middle lamella
(c) Primary cell wall (d) Plasma

44. Which one of the following cell organelles found only in plants?
(a) Golgi complex (b) Mitochondria
(c) Plastids (d) Ribosomes

45. Peroxisomes are rich in
(a) DNA (b) RNA
(c) Catalytic enzymes (d) Oxidative enzymes

RESPONSE GRID					
	31. ⓐⓑⓒⓓ	**32.** ⓐⓑⓒⓓ	**33.** ⓐⓑⓒⓓ	**34.** ⓐⓑⓒⓓ	**35.** ⓐⓑⓒⓓ
	36. ⓐⓑⓒⓓ	**37.** ⓐⓑⓒⓓ	**38.** ⓐⓑⓒⓓ	**39.** ⓐⓑⓒⓓ	**40.** ⓐⓑⓒⓓ
	41. ⓐⓑⓒⓓ	**42.** ⓐⓑⓒⓓ	**43.** ⓐⓑⓒⓓ	**44.** ⓐⓑⓒⓓ	**45.** ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 8 - BIOLOGY			
Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	45	Qualifying Score	60
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

HINTS & SOLUTIONS

DPP /CB08

1. (c) Glycosylation is the process or result of addition of saccharides to proteins and lipids. The process is one of the four principal co-translational and post-translational modification steps in the synthesis of membrane and secreted proteins and the majority of proteins synthesized in the rough ER undergo glycosylation.

2. (b) Vacuoles are present mainly in the plant cells. Each vacuole is surrounded by cytoplasmic membrane called as tonoplast which is similar to plasma membrane.

3. (b) 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.

4. (c)

5. (c) Nucleolus was discovered by Fontana (1781) and given name by Bowman (1840). It does not have membrane and is attached to chromatin at nucleolar organiser region (NOR). Nucleolus is the site for elaboration of r-RNA and synthesis of ribsomes, hence called ribosomal factory.

6. (b)

7. (a) The fluidity of membranes in a plant in cold weather may be maintained by increasing the number of phospholipids with unsaturated hydrocarbon tails.

8. (c) **9. (a)** **10. (b)**

11. (b) Fimbriae are hair like structures present in large number in bacteria. They help in attaching bacteria to solid surfaces or host tissues.

12. (d) Proteins have very specific shapes which make them ideal as receptor molecules for chemical signalling between cells. Branching side chain glycolipids on the outer surface of cell membranes are also involved in cell-cell recognition.

13. (a) The SER provides surface for the synthesis of lipids, including phospholipids, cholesterol, steroid hormones (sex hormones, adrenal corticoid hormones), ascorbic acid and visual pigments.

14. (a)

15. (b) Phospholipids in the lipid bilayer limit the permeability of the membrane.

16. (c) Vacuole is a non - living reservoir, bounded by a selectively permeable membrane, the tonoplast. It is not a air filled cavity but it is filled with a highly concentrated solution called vascular sap or cell sap. pH of vacuolar cell sap is acidic and hypertonic.

17. (c) Plastids are double membranous, semi-autonomous organelles which store and synthesise various types of organic compounds. They develop from colourless precursor proplastids. Proplastids have the ability to divide and differentiate into various types of plastids.

18. (c) Only statements Band E are incorrect as plastids have circular DNA and are found to be present in higher plants.

19. (b) **20. (a)**

21. (d) Prokaryotes possess gas vacuole.

22. (d) Membrane-less organelles.

23. (b)

24. (d) All of these

25. (b) 2n = 34

26. (d) **27. (a)** **28. (b)** **29. (d)** **30. (b)**

31. (d) **32. (c)**

33. (b) In 1935, Danielli and Davson proposed that cell membrane is made of a double layer of phospolipid molecules sandwiched between two single layers of proteins. The three layers are held together by electrostatic forces while phospholipid layers are kept adhered by vander Waal's forces.

34. (a)

35. (d) The cell membrane is asymmetric and has different properties, and functions of the cytoplasmic side versus the extracellular side. These properties arise from differences in the constituents of the membrane.

36. **(b)** Both glycolipids and glycoproteins serve as recognition signals.

37. **(a)** The charged or polar lining of the channel proteins allows passage of polar and charged molecules.

38. **(d)** All cells have a plasma membrane. The other structures listed are organelles and therefore are present only in eukaryotes.

39. **(d)**

40. **(c)** The cytoskeleton supports the cell and allows for movement of the entire cell and listed are part of the cytoskeleton.

41. **(d)** **42.** **(c)** **43.** **(b)**

44. **(c)** Plants are autotrophs and synthesize their food in the process of photosynthesis with the help of chloroplast (plastid).

45. **(d)** Peroxisomes contain glycolic acid and oxidase, which oxidises glycolic acid (a product of photosynthesis) to glyoxylic acid.