UNIT I: DIVERSITY IN THE LIVING WORLD

1. BIOLOGICAL CLASSIFICATION

1 OMQ + 1 VSAQ [1 M + 2M = 3 M]

I.MULTIPLE CHOICE Q'S(MCQ)

OMQ'S

1×1= 1 Mark

1. Two kingdom classification was given by [2]

1) Whittaker **2) Linnaeus** 3) Aristotle 4) Theophrastus

2. Bacteria that live in most harsh habitats are [4]

1) Bacteria 2) Cyanobacteria 3) Mycoplasmas **4) Archaebacteria**

3. Nitrogen Fixing Cyanobacterium is [BMP1] [2]

1) *Rhizobium* **2) *Nostoc*** 3) *Chlorella* 4) Methanogens

4. Smallest living moneran cells that lack a cell wall are [3]

1) Cyanobacteria 2) Protozoans **3) Mycoplasma** 4) Bacteria

5. Diatomaceous Earth is indestructible due to cell walls embedded by[MAR-26] [2]

1) Calcium **2) Silica** 3) Zinc 4) Phosphorous

6. Protists that form plasmodium are [2]

1) Euglenoids **2) Slime moulds** 3) Dinoflagellates 4) Diatoms

7. Which is the correct sequence of the sexual cycle of fungi [2]

1) Mitosis-Meiosis-Fertilisation **2) Plasmogamy-Karyogamy-Meiosis**

3) Meiosis- Plasmogamy-Karyogamy 4) Karyogamy-Plasmogamy-Meiosis

8. The viruses which infect bacteria are known as [2]

1) Zoophages **2) Bacteriophages** 3) Cyanophages 4) Zymophages

9. Identify the fungi that is extensively used in biochemical and genetic work. [1]

1) *Neurospora* 2) *Ustilago* 3) *Colletotricum* 4) *Saccharomyces*

10. Which of the following are very good Pollution Indicators? [3]

1) Fungi 2) Mycoplasma **3) Lichens** 4) Golden algae

II. FILL IN THE BLANKS(FIB)

1. In five kingdom classification, Bacteria are included in **Monera** kingdom.
2. Methanogens are present in gut of several ruminant animals such as cows and buffaloes and they are responsible for the production of **Methane (biogas).**
3. The colonies of cyanobacteria are generally surrounded by **Gelatinous/Muclagenous** sheath.
4. Bacteria reproduce mainly by **Binary fission.** **[BMP2]**
5. Diatoms are the chief **Producers** in the oceans.
6. Pellicle is found in **Euglenoid** organisms.
7. The network of hyphae is known as **Mycelium**.
8. *Agaricus* belongs to **Basidiomycetes** fungi.
9. **Deuteromycetes** fungi known as imperfect fungi.
10. Viroids were discovered by **T.O.Diener.**

III. ONE WORD ANSWER Q'S

1. Among five kingdom classification, eukaryotes are placed in how many kingdoms ?

A: Four

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2. What is the cell wall composition of fungi?

A: Chitin

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3. Give one example of Nitrogen fixing cyanobacteria?

A: *Nostoc* or *Anabaena*

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4. What is the protist responsible for Red tides?

A: *Gonyaulax*

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5. What are the smallest living cells which can survive without oxygen?

A: Mycoplasma

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6. What is the causative organism for Sleeping sickness disease?

A: *Trypanosoma*

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7. Which of the protists show both autotrophic and heterotrophic nutrition?

A: Euglenoids (Euglena)

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8. Agaricus belongs to which class of the fungi?

A: Basidiomycetes

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9. Which organism causes mad cow disease?

A: Prion

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10. Who proposed the name "Contagium vivum fluidum"[Infectious living fluid]?

A: Beijereinck

UNIT III : CELL: STRUCTURE AND FUNCTIONS

6. BIOMOLECULES

1 OMQ + 1 VSAQ [1M + 2M = 3 Marks]

I.MULTIPLE CHOICE Q'S(MCQ)

OMQ'S

1×1= 1 Mark

1. Chemical analysis of living organisms can be done by the usage of following chemical. [3]

   1) Ethanol 2) Benzene **3) Trichloro acetic acid** 4) Acetic acid

2. Identify the polysaccharide which is a polymer of fructose. **[BMP1]** [4]

   1) Starch 2) Glycogen 3) Cellulose **4) Inulin**

3. Identify the aromatic amino acid. [2]

   1) Glutamic acid **2) Tyrosine** 3) Lysine 4) Alanine

4. Palmitic acid contains how many carbons? [1]

   1) 16 2) 20 3) 15 4) 19

5. Cytidylic acid is a [2]

   1) Nitrogen base **2) Nucleotide** 3) Nucleoside 4) Nucleic acid

6. Concanavalin A is [2]

   1) Drug **2) Lectin** 3) Alkaloids 4) Toxins

7. Identify the secondary metabolite **[MAR-26]** [4]

   1) Amino acid 2) Nucleic acids 3) Carbohydrates **4) Rubber**

8. Which among the following is not a pyrimidine? [3]

   1) Thymine 2) Cytosine **3) Adenine** 4) Uracil

9. The following protein enables glucose uptake into cells. [1]

   1) GLUT-4 2) Collagen 3) Antibody 4) Trypsin

10. The following structure is necessary for the many biological activities of proteins. [3]

    1) Primary structure 2) Secondary structure

    3)Tertiary structure 4) Quarternary structure

11. Which among the following is not a polymer? [4]

    1) Polysaccharide 2) Protein 3) Nucleic acid **4) Lipid**

II. FILL IN THE BLANKS(FIB)

1. The pentose sugar in DNA is **Deoxyribose**.
2. Nucleic acids percentage in the total cellular mass is **5-7%**
3. Most abundant protein in the biosphere **RUBISCO**.
4. The molecular weight of macromolecules is greater than **1000** Daltons.
5. The amino acids in protein are linked by **Peptide** bond.
6. Exoskeleton of arthropods is made up of **Chitin**
7. The R-group of the serine is **CH_2OH**.
8. The micro molecule which is found in acid insoluble fraction **Lipids**.
9. Coenzyme NAD and NADP contain **Niacin** vitamin.
10. Most of the enzymes get damaged/ denatured above **40** degrees temperature.

III. ONE WORD ANSWER Q'S

1. Name the pyrimidine which is absent in the RNA.
A: Thymine

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2. Name the acid which is formed in our skeletal muscle, under anaerobic conditions.
A: Lactic acid

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3. In the presence of carbonic anhydrase how many H_2CO_3 molecules can be formed per Sec.
A: 6 lakhs

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4. What is the metal ion cofactor for the proteolytic enzyme carboxypeptidase?
A: Zn

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5. Name the non-protein constituent of the enzyme. [BMP2]
A: Cofactor

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6. What is the most abundant protein in the animal world?
A: Collagen

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7. Among the starch and cellulose which one holds iodine and gives blue colour?
A: Starch

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8. Nucleic acids with catalytic power are known as?
A: Ribozyme

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9. Name the first and last amino acids of a polypeptide chain.
A: N-terminal and C- terminal amino acids.

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10. Enzymes are categorised into how many classes?
A: 6

UNIT III : CELL: STRUCTURE AND FUNCTIONS

7. CELL CYCLE AND CELL DIVISION

1 OMQ + 1 SAQ [1 M + 4M = 5 M]

I.MULTIPLE CHOICE Q'S(MCQ)

OMQ'S

1×1= 1 Mark

1. **Phase between two successive M-phases** [3]
   1) Prophase 2) Metaphase **3) Interphase** 4) Anaphase
2. **Cell cycle duration of yeast** [2]
   1) 24 hours **2) 90 minutes** 3)20 minutes 4) 60 minutes
3. **During 'S' phase of interphase** [1]
   1) DNA synthesizes, chromosome number remains same
   2)DNA synthesizes, chromosome number doubled
   3)DNA does not synthesize, chromosome number reduced to half
   4) DNA does not synthesize, chromosome number remains same
4. **A cell in G_1 phase has 16 chromosomes, how many chromosomes does the cell have a G_2 phase.** [4]
   1) 24 2) 32 3)8 **4) 16**
5. **The cells in the quiescent stage (G_0) exit the cell cycle from the following phase.** [2]
   1) G_2 phase **2)G_1 phase** 3) S phase 4)M phase
6. **Identify the correct sequential phases in the karyokinesis.** [1]
   1) Prophase, metaphase, anaphase, telophase 2)Metaphase, anaphase, telophase, prophase
   3) Anaphase, telophase, prophase, metaphase 4) Telophase, prophase, metaphase, anaphase
7. **Centromere splitting occurring in** [2]
   1) Mitotic anaphase and meiotic anaphase – I
   2) Mitotic anaphase and meiotic anaphase – II
   3)Meiotic anaphase – I and meiotic anaphase- II 4)Mitotic anaphase only
8. **Compaction of chromosomes start from** **[BMP2]** [3]
   1) Zygotene 2) Pachytene **3) Leptotene** 4)Diplotene
9. **Bivalent formation occurs in the following stage** [1]
   1) Zygotene 2) Pachytene 3) Leptotene 4) Diplotene
10. **The X-shaped structures called chiasmata appears in** [4]
    1) Zygotene 2) Pachytene 3) Leptotene **4)Diplotene**
11. **Terminalisation of chiasmata happens in** [4]
    1) Zygotene 2) Pachytene 3) Diplotene **4) Diakinesis**
12. **A bivalent in meiosis-I consists of** [3]
    1) One chromosome, two chromatids 2) Two chromosomes, two chromatids
    3) Two chromosomes, four chromatids 4)Four chromosomes, four chromatids

II. FILL IN THE BLANKS(FIB)

1. Most suitable phase of cell division to study the morphology of chromosome is **Metaphase**
2. Prophase – I of meiosis has leptotene, **Zygotene**,pachytene, diplotene and diakinesis.
3. The stage between meiosis -I and meiosis-II is **Interkinesis** **[MAR-26]**
4. Crossing over happens in the**Pachytene** of prophase- I.
5. In meiosis splitting of centromeres in a chromosome happens during **Anaphase-II**
6. What is the longest phase in the oocytes of some vertebrates **Diplotene**
7. The disc shaped structures at the surface of the centromeres are called **Kinetochores**
8. Cell furrow forms during cytokinesis of **Animal** cell. **[BMP1]**
9. The duration of M-phase in human cells is **1 hour**
10. Which division increases the genetic variability in the population **Meiosis**

III. ONE WORD ANSWER Q'S

1. Name the two phases of cell cycle.

A: M phase and Interphase

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2. What is the approximate duration of human cell cycle?

A: 24 Hours

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3. Which of the phases of the cell cycle is of longest duration?

A: Interphase

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4. In which stage of cell cycle does DNA synthesis occur?

A: S-phase

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5. Name the stage of meiosis in which actual reduction in chromosome number occurs.

A: Anaphase-I of Meiosis -I

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6. What is the DNA content in a cell after completion of 'S' phase of interphase, when taken 2C as in its G_1 phase.

A: 4C

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7. Centriole duplication occurs in which phase of interphase.

A: S-phase

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8. Is the cell in quiescent stage (G_0) metabolically active or not.

A: Active

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9. What type of cell division is also known as equational division.

A: Mitosis

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10. How many chromatids does the prophase chromosome has?

A: Two

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11. An anther has 1200 pollen grains. How many pollen mother cells must have been there to produce them?

A: 300 pollen mother cells

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12. Given that the average duplication time of E.coli is 20 minutes. How much time will two E. coli cells take to become 32 cells?

A: 80 minutes

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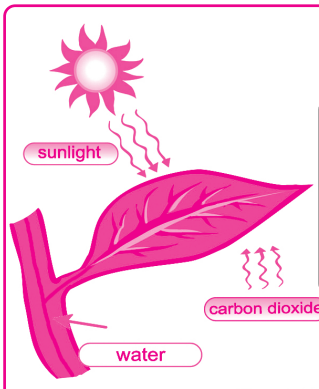
13. If a tissue has at a given time 1024 cells. How many cycles of mitosis had the original parental single cell undergone?

A: 10 Cycles



UNIT IV : PLANT PHYSIOLOGY

8. PHOTOSYNTHESIS IN HIGHER PLANTS

1 OMQ +1 VSAQ + 1 SAQ [1 M + 2 M + 4M = 7 M]

I.MULTIPLE CHOICE Q'S(MCQ)

OMQ'S

1×1= 1 Mark

1. Who discovered oxygen? [1]

1) Joseph Priestly 2) T. Engelmann 3) Jan Ingenhousz 4)Van Neil

2. Chloroplast is [2]

1) Single membrane bound organelle **2) Double membrane bound organelle**

3)Triple membrane bound organelle 4) Membrane lacking organelle

3. Which is the most abundant plant pigment in the world? [1]

1) Chlorophyll a 2) Chlorophyll b 3) Carotenoids 4) Xanthophylls

4. Maximum absorption by chlorophyll a occurs in [3]

1) blue & green region 2) red & green region

3) blue & red region 4) yellow & red region

5. LHC stands for- [2]

1) Late Harvesting Complex **2) Light Harvesting Complex**

3) Light Hanging Complex 4) Late Hanging Complex

6. During photosynthesis the O_2 is released in [1]

1) Lumen of thylakoid 2) Outer side of thylakoid

3) Stroma 4) Cytoplasm

7. For formation of 1 glucose molecule, how many turns of Calvin cycle is/are needed? [4]

1) 3 2) 1 3) 2 **4) 6**

8. The most crucial step of Calvin cycle is [2]

1) Carbonation **2) Carboxylation** 3) Reduction 4) Regeneration

9. The first stable product during CO_2 fixation in C_4 cycle is [BMP2] [3]

1) RBP 2) PEP **3) OAA** 4) PGA

II. FILL IN THE BLANKS(FIB)

1. **Joseph Priestley** in 1770 performed a series of experiments that revealed the essential role of air in the growth of green plants
2. Chlorophyll **a** is the chief pigment associatëd with photosynthesis.
3. In PS-I, the reaction centre chlorophyll-a has an absorption peak at **700** nm.
4. The splitting of water is associated with the **PS II.**
5. The **NADP reductase** enzyme is located on the stroma side of the membrane.
6. Chemiosmosis is helpful for the synthesis of **ATP.**
7. The products of light reaction are ATP, NADPH and **Oxygen.**
8. RuBP carboxylase also has an oxygenation activity, so it would be more correct to call it **RUBISCO.**
9. 'Kranz' anatomy is a characteristic feature of C_4 plants. **[BMP1]**
10. CO_2 is the major limiting factor for photosynthesis. **[MAR-26]**

III. ONE WORD ANSWER Q'S

1. What is the primary acceptor of CO_2 in C_3 plants?

A: RUBP/ Ribulose 1-5- Bis Phosphate

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2. Which is the first formed compound in C_3 plants?

A: 3 PGA

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3. What is the primary acceptor of CO_2 in C_4 plants?

A: PEP

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4. Name the first formed compound in C_4 plants.

A: OAA

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5. Where does photolysis of water take place in Chloroplast?

A: Lumen of thylakoid.

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6. Who proposed the law of limiting factors in photosynthesis?

A: Blackman.

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7. How many ATP are required for synthesis of one glucose in C3 plants?

A: 18 ATP

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8. Where does light reaction take place in chloroplast?

A: Grana or Thylakoids

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9. Where does dark reaction take place in chloroplast?

A: Stroma

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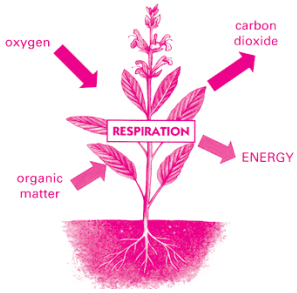
10. Name the first enzyme that is involved in the carboxylation process in C_3 Plants.

A: RUBISCO



UNIT IV : PLANT PHYSIOLOGY

9. RESPIRATION IN PLANTS

1OMQ+1 LAQ [1M+ 8 M=9M]

I.MULTIPLE CHOICE Q'S(MCQ)

OMQ'S

1×1= 1 Mark

1. Glycolysis is also known as _____ pathway. [2]

1) ETS **2)EMP** 3)ENP 4) ELP

2. End product of glycolysis is [1]

1) Pyruvic acid 2) Oxalo acetic acid

3) Citric acid 4) Phosphoenolpyruvic acid

3. Fermentation occurs when there is [2]

1) Complete supply of oxygen **2) No supply of oxygen**

3) Complete supply of water 4) No supply of water

4. In alcoholic fermentation, pyruvate is converted to which among the following? [3]

1) Ethanol, CO_2 , NADH 2) CO_2 and Methanol

3) **CO_2 and Ethanol only** 4) $CO_2$and Carboxylic acid

5. Which enzyme catalyses the oxidative decarboxylation of pyruvic acid? [4]

1) Pyruvate carboxylase 2) Lactate dehydrogenase

3) Alcohol dehydrogenase **4) Pyruvate dehydrogenase**

6. Where does TCA cycle occurs? [3]

1) Cytoplasm 2) Inner membrane of Mitochondria

3) Mitochondrial matrix 4) Stroma of Chloroplast

7. What is the first formed compound in TCA cycle ? [2]

1)Acetyl CoA **2) Citric acid** 3) Isocitric acid 4) OAA

8. Which among the following is synthesised during the conversion of succinyl –CoA to succinic acid inTCA cycle [2]

1) $FADH_2$ **2) GTP** 3) $NADH_2$ 4) $NADPH_2$

9. How many total $NADH_2$ are produced from a pyruvic acid after completion of TCA cycle? [3]

1)2 2) 3 **3) 4** 4) 5

10. The site of ETC is [3]

1) Outer membrane of mitochondria 2) Cytoplasm

3) Inner membrane of mitochondria 4) Matrix of mitochondria

II. FILL IN THE BLANKS(FIB)

1. The energy currency of the cell **ATP.**
2. Glycolysis occurs in **Cytoplasm** of cell.
3. In muscle cells of animals, when oxygen is inadequate, pyruvic acid is converted to **Lactic acid.**
4. Pyruvic acid+CoA +NAD^+ →AcetylCoA + CO_2 + NADH+H^+. Above reaction is catalyzed by enzyme **Pyruvic dehydrogenase.**
5. During the conversion of succinyl-CoA to succinic acid in citric acid cycle, a molecule of **GTP** is synthesized.
6. Tricarboxylic acid cycle was discovered by **Hans Krebs.**
7. ATP synthase is located on **Inner** membrane of Mitochondria.
8. Oxidation of one molecule of $FADH_2$ gives rise to **2 ATP** molecules of ATP.
9. Respiratory pathway is an **Amphibolic** pathway as it involves both catabolism and anabolism. **[BMP2]**
10. The ratio of the volume of CO_2 evolved to the volume of O_2 consumed in respiration is Called **Respiratory Quotient.**

III. ONE WORD ANSWER Q'S

1. Which enzyme catalyses the phosphorylation of glucose during glycolysis?

A: Hexokinase

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2. Where is electron transport system located in mitochondria of cell?

A: Inner membrane of mitochondria

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3. Name the cofactors required for the activity of pyruvate dehydrogenase.

A: $NAD^+$and CoA

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4. How many number of ATP produced when pyruvate is converted to lactate by Fermentation?

A: Zero (0)

5. In glucose, how many carbon molecules are present? **[MAR-26]**

A: 6 carbons

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6. What is the end product of anaerobic respiration in yeast?

A: Ethanol + CO_2

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7. Respiratory quotient of carbohydrates is 1. Why?

A: Volume of CO_2 evolved = Volume of O_2 consumed

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8. Glycolysis occurs in which part of the cell?

A: Cytoplasm

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9. Name the process of conversion of glucose into ethyl alcohol. **[BMP1]**

A: Fermentation

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10. Which compound serves as a connecting link between glycolysis and Kreb's cycle?

A: Acetyl Co- A