**Government College For Women (A) Kumbakonam**

**I M.Sc., Cell & Molecular biology, Sub code: P21ZC102**

**UNIT- I MCQS**

1. Robert Hooke
   1. observed the so-called cells.
   2. named mitochondria
   3. discovered plasma membrane
   4. invented the microscope
2. ----------- observed the cellular structures for the first time in plants
   1. Robert Hooke
   2. Grew and Malpighi
   3. Aristotle
   4. Anton Van Leeuvenhoek
3. Cell theorywas proposed by
   1. Schleiden and Schwann
   2. Aristotle
   3. Grew and Malpighi
   4. Robert Hooke
4. Extended cell theory was proposed by
   1. Schleiden
   2. Schwann
   3. Virchow.
   4. Antan Van Leeuvenhoek
5. ---------------- is the added concept in Extended cell theory
   1. Cells arise from pre-existing cells.
   2. All living organisms are formed of one or more cells.
   3. Cell is the Structural and functional unit of life.
   4. Energy flow (metabolism) occurs within cells.
6. Modern version of cell theory does not include
   1. Energy flow occurs within cells.
   2. Heredity information (DNA) is passed on from cell to cell.
   3. All cells have same basic chemical composition.
   4. Cells communicate with each other
7. Virus is an \_\_\_\_\_\_\_\_\_\_\_ to cell theory
   1. exception
   2. edition
   3. extraction
   4. excellence
8. why protozoans are considered as exception to cell theory
   1. They are acellular organisms
   2. They don’t have locomotor organs
   3. They don’t have meosis
   4. They can not communicate with the environment.
9. According to cell theory all living organisms are formed of one or more\_\_\_\_\_\_\_\_\_.
   1. cells
   2. tissues
   3. organs
   4. fluids
10. Robert Hooke observed cells in\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    1. meat
    2. blood
    3. cork
    4. pith

11. This is not the function of plasma membrane

a. Energy transduction

b. Intercellular interactions

c. Responding to external stimuli

d. Assisting in chromosome segregation

12. In the plasma membrane, carbohydrates

a.always faces outwards, towards extracellular space

b.directed to all sides in the membrane randomly

c.always faces to the lumen of cells

d.always faces inward to the nonpolar portion of the membrane

13. The major interaction responsible for stabilizing plasma membrane

a.hydrophobic interactions

b.hydrophilic interactions

c.covalent bonds

d.ionic bonds

14. In the plasma membrane, lipid molecules are arranged in

1. head parallel
2. alternate
3. scattered

d. series

15. Beetroot, if kept in cold water, anthocyanin does not come out since plasma membrane

1. Dead
2. differentially permeable
3. permeable to anthocyanins
4. Impermeable to anthocyanins

16. Plasma membrane is made up of

1. A protein, a lipid and a cellulose layer
2. Bimolecular lipid layer surrounded by protein layers
3. A protein layer between two lipid layers
4. A lipid layer between two protein layers

17. Fluid mosaic model for plasma membrane was proposed by

a. H. Davson and J. Danielli

b. I. Langmuir

c. C. Overton

d. S. Singer and G. Nicolson

18. Which of the following types of molecules are the major structural components of the cell membrane?

1. phospholipids and cellulose
2. nucleic acids and proteins
3. phospholipids and proteins
4. glycoproteins and cholesterol

19. Which of these often serve as receptors or cell recognition molecules on cell surfaces?

1. transmembrane proteins
2. integral proteins
3. peripheral proteins
4. glycoproteins

20. What kinds of molecules pass through a cell membrane most easily?

* + 1. large and hydrophobic
    2. small and hydrophobic
    3. large polar
    4. ionic

21. A space occurring between cells is often referred to as an

a. intercellular space.

b. intracellular space

c. extracellular space

d. intercellular fluid

22. In epithelial cells, the intercellular space is called

a. intercellular junctions

b. intercellular connections

c. intercellular groove

d. intercellular cleft

23. Intercellular space is usually

a. 10nm

b. 5nm

c. 25 nm

d. 50nm

24. The intercellular spaces are important for

a. gas exchange and water transport.

b. gas and mineral transport

c. ion transport

d. glucose transport

25. Epithelial tissue has very less or no -----------

a. cytoplasm

b. plasma membrane

c. intercellular spaces

d. nucleus

26. Each microvillus has a dense bundle of cross-linked

a. myofibrils

b. actin filaments

c. myosin filaments

d. keratin filaments

1. The microvilli effectively \_\_\_\_\_\_\_\_\_\_ of the cell and are useful for absorption
   1. increase the surface tension
   2. increase the surface volume
   3. increase the surface repulsion
   4. increase the surface area
2. Which tissues in our body contains abundant desmosomes?
   1. Liver tissues
   2. Muscles
   3. Cardiac tissues
   4. Nervous tissues
3. What is macula adhaerens?
   1. Adheren junction
   2. Plasmodesmata
   3. Cadherins
   4. Desmosomes
4. The cell adhesion molecules in desmosomes are
   1. Cadherins
   2. Maculans
   3. Actins
   4. Myosins
5. Gap junctions are not found in
   1. Nervous cells
   2. Cardiac cells
   3. Skeletal muscle cells
   4. Intestinal cells
6. The channel forming proteins in gap junctions are
   1. Connexin
   2. Cadherin
   3. Cation
   4. Catalogue
7. \_\_\_\_\_\_\_\_\_\_\_\_\_ junctions allow electrical impulses to directly pass through a regulated gate between cells
   1. Tight junctions
   2. Gap junctions
   3. Desmosomes
   4. Villi
8. Tight junctions \_\_\_\_\_\_\_ the passage of molecules and ions through the space between plasma membranes of adjacent cells
   1. Allow
   2. Leak
   3. Prevent
   4. Release
9. \_\_\_\_\_\_ and \_\_\_\_\_\_\_ are the important components of tight junctions
   1. Keratin and ceratin
   2. Cadherin and occulidin
   3. Actin and myosin
   4. Claudin and Occuludin
10. \_\_\_\_\_\_\_\_\_\_ are microscopic channels in junctions of  [plant cells](https://en.wikipedia.org/wiki/Plant_cells" \o "Plant cells) and some [algal](https://en.wikipedia.org/wiki/Algal) cells, enabling transport and communication between them.
    1. Plasmodesmata
    2. Cell wall
    3. Chlorophyll
    4. Xylum
11. All biological membranes are
    1. Impermeable
    2. Permeable
    3. Selectively permeable
    4. Selectively impermeable
12. Simple diffusion refers to a
    1. Uphill process
    2. Sidehill process
    3. downhill process
    4. tophill process
13. Simple diffusion needs
    1. no energy
    2. less energy
    3. more energy
    4. very less energy
14. Facilitated diffusion is a form of \_\_\_\_\_ transport
    1. Active
    2. Passive
    3. Ion
    4. Osmosis
15. Active transport takes place with the help of
    1. Marker proteins
    2. carrier proteins
    3. cytoplasmic proteins
    4. nuclear proteins
16. Permeases or translocases are
    1. carrier proteins
    2. cytoplasmic proteins
    3. nuclear proteins
    4. mitochondrial proteins
17. ATP driven ion pumps generate and maintain ­­­­­\_\_\_\_\_ across the plasma membrane.
    1. Concentration gradient
    2. Osmotic pressure
    3. pH gradient
    4. ionicgradient
18. Proteins that allow molecules to go in opposite directions are
    1. [co-transporter](https://en.wikipedia.org/wiki/Co-transporters)s
    2. Symporters
    3. Uniporters
    4. antiporters
19. Energy is produced in
    1. Facilitated diffusion
    2. Simple diffusion
    3. Secondary active transport
    4. Primary active transport
20. The movement of a solvent from an area of **LOW solute** concentration to an area of **HIGH solute** concentration is called
    1. ionicgradients
    2. osmosis
    3. Facilitated diffusion
    4. Simple diffusion
21. The intake of solid or liquid molecules by the invagination of plasma membrane is called
    1. Endocytosis
    2. Exocytosis
    3. Osmosis
    4. Facilitated diffusion
22. The secretory products of gland cells pass out by
    1. Exocytosis
    2. Endocytosis
    3. Osmosis
    4. Facilitated diffusion
23. Cells most often communicate by
    1. Nerves
    2. Blood
    3. chemical signals
    4. cytoplasm
24. ­­­­\_\_\_\_\_\_\_\_ bind to receptors on cells that secrete them
    1. Synaptic signals
    2. Paracrine signals
    3. Autocrine signals
    4. Endocrine signals
25. Reception, Transduction and Response are the Three Stages of
    1. Exocytosis
    2. Endocytosis
    3. Osmosis
    4. Cell Signaling
26. The molecules in the signal-transduction pathway are called
    1. second messengers
    2. first messengers
    3. autocrine signals
    4. Synaptic signals
27. The cyclic AMPmolecules are
    1. first messengers
    2. second messengers
    3. autocrine signals
    4. Synaptic signals
28. Which one of the following is not a second messenger
    1. Inositol Triphosphate
    2. Calcium ions
    3. cyclic AMP
    4. ATP
29. CAMs are
    1. Cellulose Attaching Molecules
    2. Cytotoxic Attacking Molecules
    3. Cell adhesion molecules
    4. Central Activated Molecules
30. CAMs help to hold \_\_\_\_\_\_\_ together
    1. Nucleus
    2. Plant cells
    3. animal cells
    4. Calcium ions
31. **This is the site where detoxification of xenobiotic compounds occurs**
32. Rough endoplasmic reticulum
33. Ribosomes
34. Cytosol
35. Smooth endoplasmic reticulum
36. Endoplasmic reticulum – has a role in the formation of a new nuclear membrane during
    1. cell division
    2. cytolysis
    3. cell signalling
    4. cell adhesion
37. The ER and bodies linked with it are separated as a fraction known as
    1. Episome
    2. Polysome
    3. Microsome
    4. Quantasome
38. The main organelle involved in modification and transportation of newly synthesized proteins to their destinations is
    1. Chloroplast
    2. Mitochondria
    3. Lysosome
    4. Endoplasmic reticulum
39. The Golgi apparatus of plant cells and lower invertebrates are called
    1. Suicidal bags
    2. Secretary vesicles
    3. Dictyosomes
    4. Vacuoles
40. Name the scientist who discovered Golgi apparatus?  
    a. Robert Remake  
    b. Rudolf Virchow  
    c. Camillo Golgi  
    d. Theodor Schwann
41. Which of the following organelle takes part in the secretion?  
    a. Cytoplasm  
    b. Ribosomes  
    c. ER compartments  
    d. Golgi apparatus
42. Which type of glycosylation takes place in the g=Golgi apparatus?
    1. T-linked glycosylation
    2. N-linked glycosylation
    3. O-linked glycosylation
    4. G-glycosylation

**65. which of the following statement is true**

a. microtubules are composed of tubulin

b. microfilaments are composed of actin

c. intermediate filaments are resistant to cytochalasin-B and colchicine

d. all the above

1. The cytoskeleton
   1. provides mechanical support
   2. enables cells to carry out essential functions like division and movement
   3. helps cells maintain their shape and internal organization
   4. all the above
2. Microtubules are the largest type of filament called
   1. Actin
   2. tubulin
   3. myosin
   4. troponin
3. \_\_\_\_\_\_\_ are the smallest type, with a diameter of only about 6 nm, and they are made of a protein called actin.
   1. Micro filaments
   2. tubulin
   3. Microtubules
   4. Flagella
4. The cytoskeleton of a cell is made up of
   1. Microtubules
   2. actin filaments
   3. intermediate filaments
   4. all the above
5. Movement of the daughter [chromosomes](https://www.britannica.com/science/chromosome) to the newly forming daughter cells during mitosis is brought by
   1. microfilaments b.cytoplasm

c.nucleus d.intermediate fibres

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**UNIT- II MCQS**

1. Who observed the "mitochondria'' first?
2. Kolliker
3. Robert Brown
4. Robert Hooke
5. Altmann
6. The life span of a mitochondrion is
   1. One month
   2. 5-10 days.
   3. One year
   4. 15 days
7. A. Mitochondria are not found in prokaryotes.

B. Mitochondria are not found in plant cells.

1. Statement A is true
2. Statement B is true
3. Both Statements A and B are true
4. Both Statements A and B are false
5. How do the small molecules pass through the outer membrane of mitochondria?
   1. Carrier protein
   2. Porins
   3. Channels
   4. ATP pump
6. The inner membrane space is filled with a matrix which contains
   1. Mitoribosomes
   2. mitochondrial DNA
   3. Krebs cycle enzymes
   4. All the above
7. Oxysomes of F0-F1 particles are located on
   1. Chloroplast surface
   2. Thylakoid
   3. Inner mitochondrial membrane
   4. Mitochondrial surface
8. The site of aerobic respiration in eukaryotic cells is\_\_\_\_\_\_\_\_\_\_\_
   1. Peroxisome
   2. Plastid
   3. Cilia
   4. Mitochondria
9. Mitochondrial calcium exchange isa process important in
   1. metabolic regulation and cell death
   2. cell growth
   3. catabolism
   4. metabolic suppression
10. Chemiosmotic hypothesis was formulated by
    1. Kolliker
    2. Benda
    3. Peter Mitchell
    4. Michael Peter
11. Ubiquinone (Q) is
    1. an electron carrier
    2. an electron donor
    3. an electron producer
    4. a proton carrier
12. ATP synthase is
    1. a rotating molecular motor
    2. an enzyme, a proton pump
    3. F1F0-ATPase
    4. All the above
13. The process, in which energy from a proton gradient is used to make ATP, is called
    1. Redox reaction.
    2. [chemiosmosis.](file:///C:\Users\Dell%2015\Videos\Free%20YouTube%20Downloader\Cellular%20Respiration%20(Electron%20Transport%20Chain).mp4)
    3. phosphorylation
    4. proton grading
14. Each 3600 rotation of γ subunit of ATP synthase leads to synthesis of
    1. 3 ATP’s
    2. 36 ATP’s
    3. 32 ATP’s
    4. 30 ATP’s
15. Cristae in mitochondria serves as sites for
    1. flavoproteins phosphorylation
    2. macromolecules breakdown
    3. oxidation reduction reaction
    4. protein synthesis
16. Inner mitochondrial membrane has
    1. cytochrome oxidase complex
    2. b-c 1 complex
    3. NADH dehydrogenase complex
    4. all of the above
17. Typically, the inner membrane of mitochondria is highly convoluted to form a series of infolding known as
    1. Grana
    2. cristae
    3. thylakoids
    4. lamellae
18. Pick the incorrect statement
    1. mitochondrial DNA is known as mtDNA
    2. mitochondria are the powerhouse of the cell
    3. mitochondria are the site for Calvin cycle
    4. mitochondria are the site for Krebs cycle and oxidative phosphorylation
19. Inner membrane of mitochondria is rich in phospholipid **\_\_\_\_\_\_\_**
    1. Phosphatidylserine
    2. Phosphatidylinositol
    3. Phosphatidylcholine
    4. Cardiolipin
20. Mt DNA is
    1. simple single stranded circular DNA molecule
    2. simple double stranded circular DNA molecule
    3. simple double stranded linear DNA molecule
    4. simple single stranded linear DNA molecule
21. This is not a function of mitochondria
    1. fatty acid breakdown
    2. non-shivering thermogenesis
    3. electron transport chain and associated ATP production
    4. glycolysis and associated ATP production
22. Which statement is incorrect about mitochondrial membrane?
    1. outer membrane is permeable to all molecule types
    2. outer membrane resembles a sieve
    3. outer membrane embeds enzymes of electron transfer chain
    4. none of these
23. The mitochondrial DNA differs from the nuclear DNA because of
    1. Being linear
    2. Having A = T and C – G
    3. Lacking binding histones
    4. Being highly twisted
24. Mitochondrial DNA contains
    1. 37 genes
    2. 40 genes
    3. 100 genes
    4. No genes
25. Mitochondrial DNA have
    1. many introns
    2. no introns
    3. no exons
    4. many exons
26. Mitochondrial mRNAs are
    1. polycistronic mRNAs
    2. monocistronic mRNAs
    3. inactivate mRNAs
    4. activated mRNAs
27. Mitochondrial DNA are
    1. Paternally inherited
    2. Maternally inherited
    3. Inherited both paternally and maternally
    4. Not inherited
28. [Mammalian](https://en.wikipedia.org/wiki/Mammals) mitoribosomes are
    1. 70S
    2. 80S
    3. 40S
    4. 55S
29. Red Blood Cells contain
    1. No mitochondria
    2. Large number of mitochondria
    3. Less number of mitochondria
    4. Sickle shaped mitochondria
30. [Mitochondrial DNA](https://www.britannica.com/science/mtDNA) (mtDNA)
    1. is highly susceptible to [mutations](https://www.britannica.com/science/mutation-genetics)
    2. replicates at higher rate
    3. are impotent
    4. are not inherited
31. Mitochondria are related to
    1. Prokaryotes
    2. b.Plasmids
    3. c.Plastids
    4. d.Viruses

31. Nuclei were first discovered by

A.Robert Hooke

B.Christian de Duve

C.Robert Brown

D.Robert Koch

32. Which of the following is the central commanding centre of the cell?

A.Nucleus

B.Ribosome

C.Cytoplasm

D.Golgi complex

33. Nucleus has

A.DNA only

B.DNA and protein only

C.DNA, RNA and proteins

D.None of thes

34. The nuclear membrane is in constant contact with

A.Smooth Endoplasmic reticulum

B.Rough Endoplasmic reticulum

C.Golgi apparatus

D.Lysosomes

35.The most important function of the nuclear envelope is to protect the nucleus.

A.Nucleolus

B.Nuclear Matrix

C.Nuclear Lamina

D.Nuclear Proteins

36.The number of nuclear pores depends on the

A.Size of the Cell

B.Transcriptional Activity of the Cell

C.DNA Content of the Cell

D.All of These

37 The most important function of nuclear envelope is to

A.Regulate nucleo cytoplasmic traffic

B.Protect genetic material

C.Prevent the entrance of active ribosomes into the nucleus

D.Synthesis rRNAs

38. The basic proteins of the nucleus are

A.Nucleohistones

B.Nucleoprotamines

C.Both a and b

D.None of these

39. The channel on nucleopore is called as

A.Nucleolus

B.Nucleoplasm

C.Nucleopore complex

D.Nuclei

40. Which is not transported through nuclear pore complex

A.Small molecules

B.Proteins

C.RNA

D.DNA

41The weight of small molecule that transported through nuclearpore complex**is\_\_\_\_\_KD**

A.20 B.40 C.10 D.50

42. The diameter of nucleaopore complex is

A.40nm B.10nm C.12nm D.15nm

43. RNA is transported through nuclear membrane as

A.Ribonucleo protein

B.Phospho protein

C.Glycoprotein

D.Sphingo lipid

44.Nucleus was discovered by

A.Felice Fontana

B. Robert Hook  
C. Robert Brown

D. Leeuwenhoek

45. The main function of nucleolus is  
A.Protein synthesis B. ATP production  
 C. DNA synthesis D. rRNA synthesis

**46. The term chromosome was coined by \_\_\_\_\_\_\_\_\_\_\_.**

A. Sutton B. Boveri

C.Waldeyer D. Hoffmeister

**47. Chromosomes found in the salivary gland of Drosophila is\_\_\_\_\_\_\_\_\_\_\_.**

A. Polytene B. Lampbrush

C.Supernumerary D. B-chromosomes

**48. Lampbrush chromosomes occur in\_\_\_\_\_\_\_\_\_\_\_.**

A. Oocytes B. Cancer cells

C. Lymph glands D. Salivary glands

**49. Which of the following is true about the Chromatids?**

A. It is a haploid chromosome

B. It is a complete chromosome

C. It is a duplicate chromosome

D. It is one-half of the replicated chromosome

**50. The centromere is that part of the chromosome where\_\_\_\_\_\_\_\_\_\_\_.**

A. Nicking occurs B. Chromatids are attached

C. Nucleoli are formed D. Crossing-over takes place

**51. The ends of the chromosome are called \_\_\_\_\_\_\_\_\_\_\_.**

A. Satellites B. Centromeres

C. Telomeres D. Kinetochore

**52. Chromosomes were first observed by\_\_\_\_\_\_\_\_\_\_\_.**

A. Fleming B. Waldeyer

C. Strasburger D. Hoffmeister

**53. A chromosome with sub-terminal centromere is\_\_\_\_\_\_\_\_\_\_\_.**

A. Acrocentric B. Acentric

C. Metacentric D.Telocentric

**54. The giant chromosome with a number of chromonemeta is\_\_\_\_\_\_\_\_\_\_\_.**

A. Hetrochromosome B. Polytene chromosome

C. Lampbrush chromosome D. Supernumerary chromosome

**55. A chromosome with centromere near the middle is called\_\_\_\_\_\_\_\_\_\_\_.**

A. Metacentric B. Acrocentric

C. Telocentric D. Submetacentric

**56. Puffs or balbiani rings in the salivary gland chromosome are the sites of\_\_\_\_\_\_\_\_\_\_\_.**

A. Protein synthesis B. RNA synthesis

C. DNA replication D. DNA duplication

**57. Chromosomal theory of inheritance was proposed by\_\_\_\_\_\_\_\_\_\_\_.**

A.Sutton in 1902 B. Boveri in 1902

C. Correns in 1909 D. Sutton and Boveri in 1902

58. The size of the chromosome is measured during

A.Prophase B. Metaphase

C. Anaphase D.All of these

59. The diagrammatic representation of karyotype of a species is called

A.Idiogram B.Cladogram

C. Ecogram D.Chromogram

60.Euchromatin

A. Genetically active chromatin with genes

B. Stains lightly

C. Is partially condensed

D. All of these

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**UNIT- III MCQS**

1. Which of the following organelle is called the “suicidal bags” of the cell?

(a) Cytoplasm

(b) Lysosomes

(c) Mitochondria

(d) Endoplasmic reticulum

1. The lysosomal membrane is rich in **\_\_\_\_\_\_\_\_\_\_\_.**

(a) Sterols

(b) Cardiolipin

(c) Sialic acid

(d) All of the above

1. Lysosomes are membrane-bound vesicles that arise from the\_\_\_\_\_\_\_\_\_.

(a) Golgi apparatus

(b) Mitochondria

(c) Ribosomes

(d) Endoplasmic reticulum

1. What is the pH of a lysosome?

(a) Acidic

(b) Basic

(c) Neutral

(d) Depends on the cell type

1. Which of the following enzymes are used as a marker for the lysosomes?

(a) Phospholipase

(b) Acid phosphatase

(c) Pyruvate dehydrogenase

(d) Succinate dehydrogenase

1. Which of the following are the functions of lysosomes**?**

(a) Autolysis

(b) Autophagy

(c) Digestion

(d) All of the above

1. Lysosomes are involved in\_\_\_\_\_\_\_\_\_\_\_.

(a) Digestion

(b) Intracellular digestion

(c) Extracellular digestion

(d) Both intracellular and extracellular digestion

1. Which of the following organelle is called the perinuclear dense bodies?

(a) Nucleolus

**(b) Lysosomes**

(c) Peroxisome

(d) All of the above

1. Which of the following biomolecules are the components of lysosomes?

(a) Ribosomes and Matrix

(b) Amino acid chain and tRNA

(c) Phosphate esters and nucleases

(d) Glyco protein and Carbohydrates

1. Why are lysosomes considered the “garbage trucks” of a cell?

(a) Because they transport materials between two cell organelles

(b) Because they pump materials from outside to the inside of a cell

(c) Because they remove all unwanted cellular materials

(d) Because they transport materials from one cell to another

1. Which of the following cells contain the most active lysosomes?

(a) Skin cells

(b) Brain cells

(c) Intestinal cells

(d) White blood cells

1. Name two diseases caused by lysosome malfunction?

(a) Cancer

(b) Alzheimer’s

(c) Batten Disease

(d) Aspartylglucosaminuria

13.Which of the following Scientist discovered ribosome for the first time?

a) George Emil Palade  
 b) Theodor Schwann  
c) Antonie van Leeuwenhoek  
d) Robert Hook

14.Ribosome are present in

a) Eukaryotes only

b) Eukaryotes and prokaryotes

c) prokaryotes only

d) Eukaryotes prokaryotes and viruses

15. Ribosomes are made up of

a) RNA only

b) RNA & Proteins

c) RNA, DNA & proteins

d) Nucleic acids, protein & lipids

16. The Subunit of 80s ribosome include

a) 40s & 50

b) 30s & 50s

c) 40s & 60s

d) 20s & 60s

17. Which the following ions are required for binding of ribosomal subunit

a) Na+ b) Mg++ c)Mn++ d)Fe++

18. The larger and smaller subunit of 70s ribosome is

a) 50s & 30s

b) 30s & 40s

c) 40s & 20s

d) 20s & 50s

19.Genetic information stored in mRNA is translated to polypeptide by \_\_\_\_\_\_\_\_\_\_\_

a) Ribosome  
 b) Nucleus  
 c) Endoplasmic reticulum  
 d) Golgi apparatus

20. Which of the following statement is defines polysomes?  
 a) Lysosomal aggregation  
 b) Multiple units of ribosomes  
c) Attachment of many ribosomes to common mRNA  
 d) Attachment of many mRNA to ribosomes

21. Name the site where secreted protein synthesized?  
a) ER membrane bound ribosomes  
 b) Mitochondrial ribosome  
 c) Membrane free ribosome  
 d) Chloroplast ribosome

22. Chromatids coiling in the meiotic and mitotic division is \_\_\_\_

a)Plectonemic in both

b)Paranemic in both

c)Paranemic in mitosis and plectonemic in meiosis

d)Plectonemic in mitosis and paranemic in meiosis

23. The condensation of chromosomes is observed in \_\_\_\_\_\_

a)Prophase 1

b)Anaphase 1

c)Metaphase 1

d)None of the above

24. Nuclear DNA replicates in the . \_\_\_\_\_\_\_\_ phase

a)G2 phase

b)M phase

c)S phase

d)None of the above

25. The longest stage in the cell cycle is

a)Interphase b)Anaphase c)Metaphase d)None of the above

26. The \_\_\_\_\_\_\_ state implies the exit of cells from the cell cycle

a)S b)G1 c)G2 d)G0

27. Synapsis is defined as the pairing of \_\_\_\_\_\_\_\_

a)Acentric chromosomes

b)Non-homologous chromosomes

c)Any chromosomes

d)Homologous chromosomes

28. Mitosis can be observed in \_\_\_\_\_

a)Polyploid individual

b)Diploid individual

c)Haploid individual

d)Both (1,) (2) and (3)

29. The spindle apparatus is formed during the \_\_\_\_\_\_\_\_ phase of mitosis.

a)Telophase

b)Metaphase

c)Prophase

d)Anaphase

30. Cyclin is associated with \_\_\_\_\_\_\_\_\_\_\_

a)Leptospirosis

b)Glycolysis

c)Cylosis

d)Mitosis

31. Chromosome structure can be observed best during \_\_\_

a)Anaphase

b)Metaphase

c)Prophase

d)None of the above

32. \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ coined the term “Meiosis”.

a)Van Burin and Hertwig

b)Boveri and Stuka

c)Walleye and Hofmeister

d)Farmer and Moore

33. \_\_\_\_\_\_\_\_\_ is a form of cell division which results in the creation of gametes or sex cells. a)Mitosis

**b)Meiosis**

c)Miosis

d)None of the above

34. The stage which serves as a connecting link between meiosis 1 and meiosis 2

a)Interphase 2

b)Interphase 1

c)Interkineses

d)None of the above

35. The study of different aspects of ageing is known as

(a) Gerontology

(b) Gynaecology

(c) Odontology

(d) Chronology

36. This characterizes ageing

(a) increase in the consumption of oxygen

(b) increased anabolism

(c) increased metabolic activity

(d) a decrease in the metabolic activity

37. In many mammals, even humans, ageing can be due to

(a) malnutrition and stress

(b) interaction between hereditary factors and the environment

(c) adverse alterations in the environment

(d) all of these

38. The activity of collagen protein is affected badly in old age. This is due to

(a) diffusion that becomes very high

(b) diffusion that becomes very slow

(c) permeability which becomes very high

(d) permeability which becomes very low

39. Brain and Thymus are the main factors in the ageing process

(a) Mutation theory

(b) Pacemaker theory

(c) Gene theory

(d) Stress theory

40. Which of the following theory states that accumulation of errors in cellular molecule affects the ageing process?

(a) Gene theory

(b) Environmental theory

(c) Error catastrophe theory

(d) Mutation theory

41.The programmed cell death is called

a)Necrosis

b)Apoptosis

c)Cytolysis

d)Paralysis

42.Which one of the following is **not** due to Apoptosis

a)Gangrene

b)The resorption of the tadpole tail

c)The formation of the fingers and toes of the fetus

d)The sloughing off of the inner lining of the uterus

43.What makes a cell decide to commit suicide?

a)Withdrawal of positive signals

b)Receipt of negative signals

c)Both d)None of the above

44.Increased level of oxidants within the cell

a)Induces apoptosis

b)Suppress apoptosis

c)Regulates apoptosis

d)Stops apoptosis

45. Fas ligand (FasL) is a

a)Cell division activator

b)Cell signal transmitter

c)Neurotransmitter

d)Death activator

46.Formation of irregular blebs during apoptosis is called

a)Membrane folding

b)Blebbing

c)Phagocytosis

d)Bubbling

47.Apoptic bodies are

a)Broken nuclei

b)Broken cellular vesicles

c)Broken mitochondria

d)Membrane of apoptic cells

48.Molecules that mark the cell undergoing apoptosis for [phagocytosis](https://en.wikipedia.org/wiki/Phagocytosis) are

a)Phosphatidylserine

b)Phosphocholine

c)Phosphoesterase

d)Phospholipid

49.For the initiation and execution of apoptosis, \_\_\_\_\_\_\_\_\_\_ are essential.

a)Cystases b)Lipases c)Caspases d)Phospahatases

50.Caspases are

a)cysteine proteases b)cystic bodies c)cystic fibrosis d)cysteine esterases

51.Cancer is

* 1. controlled proliferation of cells without any differentiation.
  2. uncontrolled proliferation of cells with differentiation.
  3. controlled proliferation of cells with differentiation.
  4. uncontrolled proliferation of cells without any differentiation.

52.A tumor that remains confined to its original location is called

a)A malignant tumour b)Bone tumour

c)A malignant tumour d)A benign tumour

53.Carcinoma is

a)Cancer of epithelial cells of ectoderm and endoderm

b)Cancer of epithelial cells of mesoderm

c)Cancer of vascular tissues d)Cancer of nervous cells

54.Solid tumours of connective tissues such as muscle, bone, cartilage and fibrous tissue are

a)Leukemia b)Sarcomas c)Lymphomas d)Carcinomas

55.Malignancy arises from the blood forming cell is called

a)Leukemia b)Lymphomas: c)Carcinomas d)Sarcomas

56.Identify the characteristic feature of cancer

a)Immortality b)Metastasis c)Anaplasia and dysplasia and hyperplasia d)All the above

57.CANCER =

a)Gain of oncogene(s) + Loss of TSG b)Loss of oncogenes + gain of TSG

c)Apoptosis d)Apoptosis + oncogenesis

58.Genes that have the potential to cause cancer are called

a)Silent genes b)Oncogenes c)Selfish genes d)Jumping genes

59.The first oncogene discovered was

a)Kit b)Src c)Sis d)Ras

60.Cellular versions of oncogenes are

a)Tumor Suppressor genes b)proto-oncogenes

c)Tumorpromotor genes d)Tumor enhancer genes

**I M.Sc., Cell & Molecular biology, Sub code: P21ZC102**

**UNIT- IV MCQS**

1.DNA is present in

a)Nucleus only b) Nucleus, mitochondria &ER

c) Nucleus, mitochondria &choloplast d) Nucleus, mitochondria &RER

2.Who all got the nobel prize for discovering the structure of DNA double helix

a) Watson & Crick b) Watson, Crick &Wilking

c) Watson, Crick& Franklin d) Watson, Crick & Pauling

3. A nucleoside is composed of

a) a base + a sugar b) a base + a sugar + a phosphate

c) a base + a phosphate d) None of these

4. Which of the following bases pairs with guanine?

a. Adenine b. Guanine

c. Cytosine  d. Uracil e. Thymine

5. According to Chargaff rule, which one is correct?

a) A+T=G+C b)A+C=G+T

**c) A+G=T+C** d) All of these

6. Adjacent nucleotides are joined by

a) Covalent bond b) Phosphodiester bond

c) Ionic bond d)Peptide bond

7. In a nucleotide, the nitrogen base is joined to the sugar molecule by

a) Phosphodiester bond b) Glycosidic bond

c) Hydrogen bond d) (a) &(b)

8.The type of sugar in DNA

a) Triose b)Tetrose c) Pentose d) Hexose

9. If a double stranded DNA has 20% Thymine, the percentage of Guanine in the DNA

a) 30% b) 10% c) 90% d) 40%

10. If a DNA contains 1000 base pairs, what would be its length?

a) 3400 Å b) 34000 Å c) 6800 d) 1000 Å

11. Pick the right difference between a DNA and RNA

a) Sugar and phosphate b) sugar and purines

c) purines and phosphate d) sugar and pyrimidines

12. Watson & Crick double helical DNA is a

a) A- DNA b) )B- DNA **c)** ) Z- DNA d) ) D- DNA

13. Z DNA have a

a) Double helical nature b) Zig-Zag appearance

c) Uracil base d)Singlestanded nature

**14. The type of coiling in DNA is**

(a) Zig-zag (b) Left-handed (c) Opposite (d) Right-handed

**15. In DNA, the enzyme which breaks the H2 bonds is**

(a) Ligase (b) Helicase(c) Topoisomerase (d) Polymerase

**16. The bases are held together in a DNA double helix by hydrogen bonds. These bonds are**

(a) Ionic bonds (b) Covalent bonds

(c) Non-covalent bonds(d) Van der Waals forces

17. What should be the complementary stand of 3’ ATGGCTTGA 5’?

a) 3’ TACCGAACT 5’ b) 5’ TACCGAACT 3’

c) 3’ TAGGCAAGT 5’ d) 5’ TAGGCAAGT 3’

18. DNA replication is

a) Conservative b) Non-Conservative c) Semi-Conservative d)None

19. Enzyme which can break and seal the DNA strand

a) Topoisomease II(b) Helicase (c) Primase (d) Restriction endonuclease

20. Eukaryotes differ from prokaryotes in mechanism of DNA replication due to

a) Use of DNA primer rather than RNA primer

b) Different enzyme for synthesis of lagging & leading stand

c) Discontinuous rather than semi- discontinuous replication

d) Unidirection rather than semi- discontinuous replication

21.Which of the following enzymes remove supercoiling in replication DNA ahead of replication fork

a) DNA polymerase b) Helicase c) Primases d) Topoisomerases

22**.** Which of the following enzymes is the principle replication enzyme in E.coli

a) DNA polymerase I b) DNA polymerase II

c) DNA polymerase III d) None of these

23.Both stands of DNA serve as templates concurrently in

a) replication b) excision repair c) mismatch repair d) None of these

24. During electrophoresis denaturation of the double stranded DNA is brought about by \_\_\_\_\_\_\_\_\_\_  
a) Treatment with alkali b) Application of current  
 c) Treatment with EtBr d) Application of heat

25. What is a probe?  
 a) Chemically synthesized DNA b) Purified DNA  
 c) Fragmented DNA duplex d) Either purified or synthesized single stranded DNA

26.Loss of H-bond between two complementary stands results in

a) Stand binding b) Stand separation

c) Stand destruction d) ligation

27.The DNA can be denatured by

a) rising temperature b)chemical treatment

c) both a & b d) normal condition

28.A technique which measures genetic distance between two species is called

a) DNA hybridization b) DNA reannealing c)DNA denaturation d)DNA sequencing

29.The hybridization technique was devised by

a) Pardue& Gall b) Watson &Crick

c) Wilson &Thomas d)Jacob& Monad

30.The main function of DNA

a) DNA controls all life activities

b) DNA synthesizes RNAs

c) DNA has the genetic information for protein synthesis

d) All of the above

31. Which of the following is found more widely in a cell?

(a) RNA (b) DNA

(c) Sphaerosomes (d) Chloroplasts

32. RNA contains Uridine, it is a

(a) pyrimidine (b) purine

(c) nucleotide (d) nucleoside

33. Which of the following enzymes is non-proteinaceous?

(a) deoxyribonuclease (b) ligase

(c) ribozyme (d) lysozyme

34. Which of the following purine bases is present in RNA?

(a) Uracil (b) Thymine

(c) Cytosine (d) Guanine

35. RNA contains repeating units of

(a) deoxyribonucleotides (b) ribonucleotides

(c) deoxyribonucleosides (d) ribonucleosides

36. Which of the following RNAs are the most abundant in an animal cell?

(a) mRNA (b) tRNA

(c) miRNA (d) rRNA

37.Which of the following is the smallest of the RNAs?

a)Messenger RNA b)Transfer RNAs

c)Ribosomal RNAs d)All of these

38. In RNA, uracil pairs with

a)adenine b)cytosine

c)thymine d)guanine

39. Which of the following is not a form of RNA?  
 a) mRNA b) tRNA  
 c) qRNA d) rRNA

40. A single strand of mRNA attached to complex of ribosomes is called

(a) Okazaki fragments (b) polymer

(c) polysome (d) polypeptide

41. Which of the following is not a base of RNA?  
 a) Thymine (T) b) Adenine (A)  
 c) Cytosine (C) d) Guanine (G)

42. Name the RNA molecules which is used to carry genetic information copied from DNA?  
 a) tRNA b) mRNA  
 c) rRNA d) snRNA

43. The Term mRNA was coined by

a) Pardue& Gall b) Watson &Crick

c) Wilson &Thomas d)Jacob& Monad

44. The initiation codon of mRNA

a)AUG b)CAG c)GUU d)UAA

45. The termination codon of mRNA

a)AUG b)CAG c)GUU d)UAA

46. Which of the following RNA molecule convert information stored in the nucleic acid to protein?  
 a) mRNA b) snRNA  
 c) rRNA d) tRNA

47. Name the secondary structure of tRNA.  
 a) Cloverleaf b) L-shaped  
 c) Duplex d) Triple Heli

48. Anticodon is present **in**

(a) DNA (b) tRNA (c) rRNA (d) mRNA

49. Molecules which play the key role in the transfer of genetic information during protein synthesis are \_\_\_\_\_\_\_\_\_\_\_  
 a) DNA b) RNA  
 c) Nucleic acid d) Lipids

50. Which form of structure has been adopted by RNA?  
a) A-formb) B-form  
 c) Z-form d) D-form

51. Name the RNA molecule which takes part in the formation of the ribosome?  
 a) mRNA b) tRNA  
 c) rRNA d) gRNA

52. Which of the following rRNA molecules have peptidyltransferase activity in prokaryotes?  
a) 23S rRNA b) 28S rRNA  
 c) 5S rRNA d) 18S rRNA

53. What is the function of messenger RNA?

a)It carries amino acids

b)It is a component of the ribosomes

c)It is a direct copy of a gene

d)It is the genetic material of some organisms

54. Two features of the tRNA molecule associated, in converting the triplet codon to an amino acid, are

a)in the T Loop and D stem and loop b)in the anticodon loop and D stem loop

c)in the anticodon loop and the 3′ CCA end d)none of the above

55.Which of following RNA characteristically contains unusual purines and pyrimidmes?

a)rRNA b)nRNA c)mRNA d)tRNA

56.Ribosomal RNA is

a) Soluble RNA b) insoluble RNA

c) hn RNA d)adaptor RNA

57. Which of the following statement is Incorrect about SnRNA?  
 a) It is small nuclear RNA  
 b) It helps in RNA splicing  
 c) It is also called snurps  
 d) It functions in RNA editing

58. What is the role of snoRNA in eukaryotes?  
a) Chemical modification  
 b) RNA splicing  
 c) Act as adaptor RNA  
 d) Forms component of the ribosome

59. Name the class of RNA which takes part in RNA Editing?  
 a) snRNA b) tRNA c) gRNA d) SiRNA

60. Which of the following rRNAs in bacteria acts as a ribozyme as well as structural RNA?

(a) 23S rRNA (b) 18S rRNA (c) 5.8S rRNA (d) 5S rRNA

**I M.Sc., Cell & Molecular biology, Sub code: P21ZC102**

**UNIT- V MCQS**

1. The codon is a \_\_\_\_\_\_\_\_\_\_\_\_  
   a) Singlet b) Duplet c) Triplet d) Quadruplet
2. A codon contains how many nucleotides?  
   a) 1 b) 2 c) 3 d)4
3. The initiation codon is \_\_\_\_\_\_\_\_\_\_\_\_  
   a) AUG b) UAA c) UAG d) UGA
4. Which of the following is not a termination codon?  
   a) UGA b) AGA c) AGG d) UAC
5. UAA is known as
6. Opal b) Amber c)Ochre d)None of these
7. Amber is

a)AAA b)GGG c) UAG d)CCC

7. Opal is

a)UUG b)UGAc)AGU d)UUU

8. Which position of a codon is said to wobble?  
a) First c) Third  
b) Second d) Fourth

9. In case of mitochondrial genetic code UGA is a \_\_\_\_\_\_\_\_\_\_\_\_ codon.  
a) Tryptophan c) Proline  
b) Arginine d) Stop

10. The wobble hypothesis was devised by \_\_\_\_\_\_\_\_\_\_\_\_  
a) Arthur Kornberg b) Francis Crickc) James Watson d) William Asbury

11. In which of the following cases the first base of anticodon pairs with only one codon?  
a) When the first base of anticodon is A or C  
b) When the first base of anticodon is A or G  
c) When the first base of anticodon is inosine  
d) When the first base of anticodon is G or U

12. In which of the following cases the first base of anticodon pairs with three codons?  
a) When the first base of anticodon is A or C  
b) When the first base of anticodon is A or G  
c) When the first base of anticodon is inosined) When the first base of anticodon is G or U

13. The genetic code translated the language of \_\_\_\_\_\_\_\_\_\_\_\_  
a) Proteins into that of RNA  
b) Amino acids into that of RNA  
c) RNA into that of proteins  
d) RNA into that of DNA

**14. This is incorrect about the nature of genetic code.**

(a) universal (b) overlapping (c) commaless (d) triplet

**15. This best describes a polysome**

(a) active site for synthesis of lipids (b) active site for synthesis of proteins

(c) active site for synthesis of DNA (d) all of these

16. Genomic DNA is \_\_\_\_\_\_\_ resulting in the production of \_\_\_\_\_\_\_.

a)Transcribed mRNA b)Translated, tRNA

c) Transcribed, DNA d )Translated, protein

17. Process of transcription included three stages named as

a) Initiation & Termination only b) Elongation only

c) Translation d) Initiation ,elongation& termination

18. RNA in prokaryotes is synthesized with the help of enzyme called

a) Ribonucleic acid polymerase c) Gyrase

b) Ligase d) Helicase

19. The enzyme required for transcription is

(a) RNAase (c) RNA polymerase

(b) DNA polymerase (d) Restriction enzym

20. Transcription is the transfer of genetic information from

(a) DNA to RNA

(b) DNA to mRNA

(c) mRNA to tRNA

(d) tRNA to mRNA

21. Sigma factor is a component of

(a) DNA ligase (c) Endonuclease

(b) DNA polymerase (d) RNA polymerase

22. The main function of tRNA with regards to protein synthesis is

(a) Proofreading

(b**)** identifies amino acids and transports them to ribosomes

(c) Inhibits protein synthesis

(d) all of the above

23. One end of tRNA matches genetic code in three-nucleotide sequences known as

(a) codon (c) blunt ends

(b) genetic code (d) anticodon

24. The longest primary transcript is generated by

(a) dystrophin gene (b) Tintin gene (c) neuromedin u (d) centromere protein A

25. A DNA sequence is read by an RNA polymerase that produces complementary antiparallel RNA strand known as

(a) Hexa transcript (b) secondary transcript(c) primary transcript (d) tertiary transcript

26. Which of these subunits of RNA polymerase is totally required to initiate transcription?

(a) alpha (α) (b) sigma (σ) (c) omega (ω) (d) beta (β)

27. In both prokaryotic and eukaryotic cells, the synthesis of protein chains is initiated with

(a) Arginine (b) Methionine (c) Serina (d) Valine

28. In eukaryotes, in order to initiate transcription

(a) RNA strand must be present (b) RNA polymerase must be present

(c) Core promoter sequence must be present (d) None of these

29. The process of formation of RNA is known as\_\_\_\_\_\_\_\_\_\_\_

a) Replication c) Translation  
 b) DNA repair d) Transcription

30. Which of the following transcription termination technique has RNA dependent ATPase activity?  
a) Intercalating agents b) Rho dependent  
c) Rho independent d) Rifampcin

31. Peptidyltransferase

a) Is a 23s rRNA b) forms peptide bonds

c) component of ribosome d) all the three

32. Which mRNA will be translated to a polypeptide chain containing 8 amino acids?

a) AUGUUAAUAGACGAGUAGCGACGAUGU

b) AUGAGACGGACUGCAUUCCCAACCUGA

c) AUGCCCAACCGUUAUUCAUGCUAG

d) AUGUCGACAGUCUAAAACAGCGGG

**33. In protein synthesis, translocation is initiated with the movement of**

(a) tRNA from P-site to the A-site

(b) dipeptidyltRNA from A-site to P-site

(c) tRNA from A-site to P-site

(d) tRNA from P-site to E-site

34. Translation is the

a) Synthesis of DNA from a mRNA template

b) Synthesis of protein from a mRNA template

c) ) Synthesis of RNA from a mRNA template

d) Synthesis of DNA from a DNA template

35. Translation occurs in the

a)nucleus b) cytoplasm c)nucleolus d)lysosome

36. During translation, protein are synthesized

a) by ribosome using the information on DNA

b) by lysosome using the information on DNA

c) by ribosome using the information on mRNA

d) by ribosome using the information on rRNA

37. The enzyme involved in amino acid activation is

a) ATP synthetase

b) aminoacyltRNAsynthetase

c)aminoacyl mRNA synthetase

d)aminoacylrRNAsynthetase

**38. The process by which protein synthesis from genetic code occurs is best described by**

(a) transcription (b) translation (c) replication (d) reproduction

**39. This elongation factor is known as translocase**

(a) EFG (b) EF2 (c) both (a) and (b) (d) EF-Tu and EF-Ts

**40. This drug inhibits the initiation step of translation**

(a) ricin (b) tetracycline (c) streptomycin (d) cyclohexylamine

**41. In translation, this is not an essential component**

(a) amino acid

(b) ligase

(c) mRNA

(d) anticodon

**42. This identifies a particular amino acid and its cognate tRNA molecule**

(a) topoisomerase (b) rRNA

(c) Ribosome (d) tRNAsynthetase

43. Which of the following is not a type of post translational modification?  
 a) Proteolysis b) Protein folding  
 c) Glycosylation d) Lipid addition

44. The amino acid is the signal sequence in any polypeptide chain for \_\_\_\_\_\_\_\_\_\_\_\_  
 a) Protein activity  
 b) Glycosylation site  
c) Proteolytic site  
 d) Site for lipid addition

45. Lac operon was discovered by

a) Jacob and Monod c) Nirenberg and mathaei

b) Watson and Crick d) Pardue and Gall

46. Lac operon is an example of

(a) only positive regulation

(b) only negative regulation

**(**c) both positive and negative regulation

(d) sometimes positive sometimes negative

47. In the presence of lactose, how long does it take for the lac operon to be expressed?

(a) when lactose equals glucose concentration

(b) when glucose is more than lactose concentration

(c) as long as lactose is more than glucose concentration

(d) as long as lactose is more than galactose concentration

48. Which of these acts as an inducer of the lac operon?

(a) Allolactose

(b) Lactose

(c) Galactose

(d) Glu

49. The sequence of the structural genes in the lac operon is

(a) lacA-lacZ-lacY

(b) lacZ-lacY-lacA

(c) lacZ-lacA-lacY

(d) lacA-lacY-lacZ

50. Regulation of the lac operon can be envisioned as regulation of enzyme synthesis by its

(a) lactose

(b) substrate

(c) carbohydrates

(d) all of the above

51. Lac Operon will be turned on when

(a) Lactose is less than glucose

(b) Lactose is less in the medium

(c) Lactose is more than glucose

(d) Glucose is enough in the medium

52. In a cell as per the Operon Concept, the regulator gene governs the chemical reactions by

(a) Inhibiting the substrate in the reaction

(b) Inhibiting migration of mRNA into cytoplasm

(c) mRNA transcription inhibited

(d) Enzyme-reaction inactivation

53. In Lac-operon, the gene product of LacA gene is

(a) Beta-galactosidepermease

(b) Beta-galactosidetransacetylase

(c) Beta-galactosidase

(d) Beta-galactosideisomerase

54. This condition in lac operon facilitates the condition of lac genes being transcribed at high levels

(a) low glucose, high lactose

(b) low glucose, low lactose

(c) high glucose, high lactose

(d) high glucose, low lacto

55. The correct option regarding the lac operon in E.coli from the following is

(a) Lac operon is switched on in the absence of lactose

(b) Lac repressor binds to the lac promoter

(c) β-galactosidase is the only enzyme produced in large quantities when lac operon is turned on

(d) lac operon messenger RNA is a polycistronic mRNA

56. Which of these operons is anabolic?  
 a) Lac b) Ara c) Trp d) Phe

57.Which of these systems give the best mode for turning trp operon off?  
a) Repressor  
b) Attenuator  
c) Repressor with a downstream poly A tail  
d) Repressor with an attenuator

58. A Lac repressor is a tetramer repressed when bound to the inducer. The trp repressor is a \_  
 a) Dimer inactivated when bound to the inducer  
b) Dimer activated on inducer binding  
c) Tetramer inactivated on inducer binding  
d) Tetramer activated on inducer binding

59. It is well known that lactose has a positive impact on the activity of the lac operon. Tryptophan’s presence has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
 a) Positive feedback  
b) Negative feedback  
c) No difference  
d) Highly positive impact

60. Which of the following statements regarding the regulation of trp operon expression by attenuation is correct?  
a) Rapid translation of the leader peptide prevents completion of mRNA transcript  
b) Rapid translation of the leader peptide allows completion of mRNA transcript  
c) The leader peptide sequence encodes enzymes required for tryptophan synthesis  
d) The leader peptide sequence contains no tryptophan residues

**Cell and Molecular Biology – Multiple choice Questions – Keys**

**UNIT-I**

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

**UNIT-II**

1.a 2.b 3.a 4.b 5.d 6.c 7.d 8.a 9.c 10.a 11.d 12.b 13.a 14.c 15.d 16.b 17.c 18.d 19.b 20.d 21.c 22.c 23.a 24.b 25.a 26.b 27.d 28.a 29.a 30.c 31.c 32.a 33.c 34.b 35.c 36.b 37. b 38.c 39.c 40.d 41.a 42.a 43.a 44.a 45.d 46.c 47.a 48.a 49.d 50.b 51.c 52.d 53.a 54.b 55.d 56.b 57.d 58.b 59.a 60.d

**UNIT-III**

1.b 2.c 3.a 4.a 5.b 6.d 7.d 8.b 9.c 10.c 11.d 12.d 13.a 14.b 15.b 16.c 17.b 18.a 19.a 20.c 21.a 22.d 23.a 24.c 25.a 26.d 27.d 28.d 29.b 30.d 31.b 32.d 33.b 34.c 35.a 36.d 37.d 38.a 39.b 40.c 41.b 42.a 43.c 44.a 45.b 46.b 47.b 48.a 49.c 50.a 51.d 52.d 53.a 54.b 55.a 56.d 57.a 58.b 59.b 60.a

**UNIT-IV**

1.c 2.a 3.a 4.c 5.c 6.b 7.b 8.c 9.a 10.a 11.d 12.b

13.b 14.d 15.b 16.c 17.b 18.c 19.a 20.c 21.d 22.c 23.a 24.a

25.d 26.b 27.c 28.a 29.a 30.d 31.a 32.d 33.c 34.d 35.b 36.d

37.b 38.a 39.c 40.c 41.a 42.b 43.d 44.a 45.a 46.d 47.a 48.b

49.b 50.a 51.c 52.a 53.c 54.c 55.d 56.b 57.d 58.a 59.c 60.a

**UNIT-V**

1.c 2.c 3.a 4.d 5.c 6.c 7.b 8.c 9.a 10.b 11.a 12.c

13.c 14.b 15.b 16.a 17.d 18.a 19.c 20.b 21.d 22.b 23.d 24.a

25.c 26.b 27.b 28.c 29.d 30.b 31.b 32.c 33.b 34.b 35.c 36.c

37.b 38.b 39.c 40.c 41.b 42.d 43.b 44.c 45.a 46.c 47.c 48.a

49.b 50.d 51.c 52.d 53.b 54.a 55.d 56.c 57.d 58.b 59.b 60.a