**UNIT 4 – MECHANOCHEMISTRY – MCQ’S**

1.FoF1 ATP motor is present in\_\_\_\_\_\_\_\_\_\_\_.

**a) Mitochondria**

b) Centrosomes

c) Ribosomes

d) Lysosomes

2. The locomotion of bacteria is with \_\_\_\_\_\_\_\_\_.

a) Cilia

**b) flagellum**

c) bristle

d) villi

3. Intermediate filaments are made of\_\_\_\_\_\_\_\_\_\_\_\_\_.

a) actin

**b) Keratin**

c) tubulin

d) myosin

4. \_\_\_\_\_\_\_\_\_\_\_motor involve in muscular contraction.

**a) myosin**

b) dynein

c) kinesin

d) flagellar

5. The bacteria having flagellar in all directions are called\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a) mono trichous

b) lopho trichous

c) amphi trichous

**d) peri trichous**

6. Microfilaments are made of \_\_\_\_\_\_\_\_\_\_\_.

**a) actin**

b) keratin

c) tubulin

d) myosin

7. \_\_\_\_\_\_\_\_\_\_\_involved in the movements of cilia and flagella.

a) myosin

**b) dynein**

c) kinesin

d) ATP synthase

8. Microtubules are made of \_\_\_\_\_\_\_\_\_\_\_\_\_.

a) actin

b) kinesin

c) dynein

**d) Tubulin**

9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_motor move towards the nucleus.

a) Actin

b) Kinesin

**c) Dynein**

d) Myosin

10. \_\_\_\_\_\_\_\_\_\_\_\_motor move away from nucleus.

a) Actin

**b) Kinesin**

c) Dynein

d) Myosin

11. The degradation of contaminants into less hazardous substance using microbes is called\_\_\_\_\_\_\_\_.

a) bioaccumulation

**b) bioremediation**

c) bio magnification

d) biosensor

12. F1 motor of ATP synthase composed of \_\_\_\_\_\_\_\_\_\_\_\_subunits.

a) 6

b) 7

c) 9

**d) 5**

13. If cluster of flagella present on one side of bacterial cell is called\_\_\_\_\_\_.

a) mono trichous

**b) lopho trichous**

c) amphi trichous

d) peri trichous

14. \_\_\_\_\_\_\_\_\_\_\_\_\_motor protein move from the minus end to the plus end of microtubule in the transportation of cargo.

a) Dynein

b) Tietin

**c) Kinesin**

d) Nubulin

15. \_\_\_\_\_\_\_\_\_\_\_\_factor is not related to bioremediation.

a) Nutrients

b) type of soil

c) Temperature

**d) Light**

16. \_\_\_\_\_\_\_\_\_\_\_is the major component of cytoskeleton.

a) Kinesin

**b) Microfilament**

c) Myosin

d) Dynein

17. \_\_\_\_\_\_\_\_\_\_protein move from the plus end to the minus end of microtubule in the transportation of cargo.

**a) Dynein**

b) Tietin

c) Kinesin

d) Nubulin

18. The striated muscle type is present in \_\_\_\_\_\_\_\_\_\_\_.

a) liver

**b) heart**

c) blood vessel

d) bone

19. \_\_\_\_\_\_\_\_\_\_\_example of bio element.

a) antibody

b) DNA

c) Enzyme

**d) all the above**

20. Molecular machines are made up of \_\_\_\_\_\_\_\_\_.

**a) protein**

b) DNA

c) protein

d) carbohydrate

21. Bacterial flagellar motor is operated by \_\_\_\_\_\_\_\_\_\_\_\_.

a) kinesin

b) myosin

c) dynein

**d) ATP**

22. The cytoskeleton is made up of \_\_\_\_\_\_\_\_-major components.

**a) 3**

b) 4

c) 6

d) 2

23. Microtubule is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_protein.

a) flagellin

**b) tubulin**

c) actin

d) dynein

24. In Pregnancy test biosensor detects the -------in urine

a) creatine

**b) hCG protein**

c) albumin

d) glucose

25. If tuff of flagella present in one side of bacteria it is called as\_\_\_\_\_\_\_.

a) Amphitrichous

b) Monotrichous

c) peritrichous

**d) lophotrichous**

26. Myosin uses the energy released from to move along actin

a) ADP hydrolysis

b) ATP oxidation

c) GTP hydrolysis

**d) ATP hydrolysis**

27. Axonemal dyneins are involved in

a) moving ions

b) producing bending motions of cilia and flagella.

c) moving proteins

**d) cargo movement**

28. ATP synthase consists of two portions

a) F2 F4

b) F2 F3

**c) F0 F1**

d) F1 F4

29. The Biomolecules are qualitatively and quantitatively detected by\_\_\_\_\_\_\_\_\_\_\_\_.

**a) bio sensor**

b) bioremediation

c) biomagnification

d) bioaccumulation

30. \_\_\_\_\_\_\_\_\_ part of biosensor, which convert bio signal into electrical signal.

a) receptor

b) communicator

**c) transducer**

d) biological compounds

31. The genetically modified microorganism mediated transformation of contaminants into non-hazardous substances is called\_\_\_\_\_\_\_\_\_\_\_\_.

**a) bio venting**

b) bio augmentation

c) bio piling

d) bioleaching

32. \_\_\_\_\_\_\_\_\_\_\_ is used in forensic science.

a) glucose biosensor

**b) DNA biosensor**

c) elementary biosensor

d) oxidised biosensor.

33. \_\_\_\_\_\_\_\_\_\_\_\_\_ is the process of stimulating the natural in situ bioremediation of contaminants in soil.

**a) bio venting**

b) bio chelation

c) bio oxidation

d) bio formation

34.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the major component of cytoskeleton.

a) kinesin

**b) microfilament**

c) myosin

d) dynein

35. Molecular machines are made up of \_\_\_\_\_\_\_\_\_\_\_\_.

a) carbohydrate

**b) proteins**

c) lipids

d) DNA

36. \_\_\_\_\_\_\_\_\_\_\_\_protein abundantly present in blood.

a) keratin

b) actin

**c) globin**

d) albumin

37. Biosensors used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_detection is called bio detectors.

a) DNA

b) RNA

c) Glucose

**d) Enzymes**

38. \_\_\_\_\_\_\_\_\_\_\_\_\_type of transducers used for enzymes.

a) Ion selective

**b) Electrochemical**

c) priteinometric

d) optical

39. Enzyme electrodes are developed by\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a) Mayer’s

b) Erwin

**c) Leland**

d) Charles

40. Fo of ATP are composed of \_\_\_\_\_\_\_\_\_\_\_\_ subunits.

**a) 3**

b) 2

c) 4

d) 5

41. The microbial activity can be improved by maintaining soil moisture to\_\_\_\_\_\_\_\_\_\_.

**a) 40-60%**

b) 80-100%

c) 50-70%

d) 80-120%

42. The thick and thin filaments in muscles are joined by\_\_\_\_\_\_\_\_\_\_\_.

a) A band

b) peptide

c) H zone

**d) cross bridges**

43. ATP synthase consists of \_\_\_\_\_\_\_\_\_\_\_\_portions.

**a) 2**

b) 3

c) 7

d) 5

44. Myosin head dissociate from thin filament due to hydrolysis of \_\_\_\_\_\_\_\_\_\_\_\_\_.

a) FAD

b) NAD

**c) ATP**

d) NADH

45. The muscle found in blood vessels and visceral organ is \_\_\_\_\_\_\_\_\_\_\_\_.

a) cardiac

b) epithelial

**c) smooth**

d) skeletal

46. Muscle fibres are composed of \_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_filaments.

**a) actin and myosin filament**

b) actin and actin

c) myosin and myosin

d) thick filaments

47. \_\_\_\_\_\_\_\_\_\_\_protein involved in muscle contraction with actin and myosin.

**a) troponin**

b) gluconin

c) keratin

d) fibrin

48) The shortening of muscle length along with sarcomere is called\_\_\_\_\_\_\_\_\_\_\_\_.

a) muscle relaxation

**b) muscle contraction**

c) muscle cross bridge

49. Muscle fibres are composed of \_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_filaments.

**a) thick and thin filaments**

b) actin and actin

c) myosin and myosin

d) thick and thick filaments

50. The network of filaments and tubules extends throughout the cytoplasm is called\_\_\_\_\_\_\_

a) Microtubule

b) Microfilaments

**c)** **cytoskeleton**

d) intermediate filaments

51.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to give the cells its shape and mechanical support.

a) Microtubule

b) Microfilaments

**c)** **cytoskeleton**

d) intermediate filaments

52. In [neurons](https://en.wikipedia.org/wiki/Neuron) the intermediate filaments are known as\_\_\_\_\_\_\_\_\_\_\_\_\_

**a)** [**Neuro filaments**](https://en.wikipedia.org/wiki/Neurofilament)

b) Micro filaments

c) Neuro tubule

d) Micro tubule

53. Microtubules are composed of [tubulin](https://en.wikipedia.org/wiki/Tubulin) which diameter is \_\_\_\_\_\_\_\_\_\_\_\_

a) 7 nm

b) 10 nm

c) 12 nm

**d) 25 nm**

54. Microfilaments are also known as \_\_\_\_\_\_\_\_\_\_\_\_ filaments

**a) Actin filaments**

b) Myosin filaments

c) intermediate filaments

d) thick filamens

55. \_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_ involved in muscle contraction and relaxation.

**a) Actin and Myosin**

b) Dynein and Kinesin

c) Actin and Actin

d) Myosin and Myosin

56. Micro tubule involved in \_\_\_\_\_\_\_\_\_\_\_ cellular function.

a) cell metabolism

b) cell respiration

c) cellular digestion

**d) cell division**

57. The average diameter of the inter mediate filament is\_\_\_\_\_\_\_\_\_

a) 2-3 nm

**b) 7-8 nm**

c) 12-13 nm

d) 18-20 nm

58. Pathogens present in food are detected in food industry by\_\_\_\_\_\_\_\_\_\_\_\_

a) bioremediation

**b)** **biosensor**

c) bioventing

d) bioaccumulation

59. F1 motor of ATP synthase composed of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ subunits.

a) 3

b) 4

**c) 5**

d) 6

60. Molecular machines are made-up of \_\_\_\_\_\_\_\_\_\_\_.

**a) Protein**

b) DNA

c) Carbohydrate

d) Lipids

61.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ protein abundantly present in blood.

a) Keratin

**b) Globin**

c) Albumin

d) Actin

62. F0 of ATPase composed of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ subunits.

a) 2

**b) 3**

c) 4

d) 5

63. Biosensors used for \_\_\_\_\_\_\_\_\_\_\_ detection is called bio detectors.

a) Enzymes

b) DNA

c) Glucose

**d) All the above**

64. Enzyme electrodes are developed by \_\_\_\_\_\_\_\_\_\_\_.

a) Charles

b) Meyer

c) Edwin

**d) Leland**

65. \_\_\_\_\_\_\_\_\_\_\_\_\_ type of transducers are used for enzyme detection.

a) Ion selective

b) Optical

**c) Electrochemical**

d) Potentiometric

66. The microbial activity can be improved by maintaining soil moisture to \_\_\_\_\_\_\_\_\_\_\_\_.

**a) 40-60%**

b) 80-100%

c) 50-70%

d) 80-120%

67. The thick and thin filaments of muscles are joined by \_\_\_\_\_\_\_\_\_\_\_

a) A band

b) Z band

**c) Cross bridge**

d) H zone

68. ATP synthase consists of \_\_\_\_\_\_\_\_\_\_\_\_\_ protein.

**a) 2**

b) 3

c) 5

d) 7

69. F0F1 ATP synthase are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rotatory motors.

a) CW

**b) Reversible**

c) CCW

d) Irreversible

70. In glucose biosensor \_\_\_\_\_\_\_\_\_ is the bioactive compound.

a) Glucose

b) ATP

**c) Enzyme**

d) FAD

71. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are commonly coated to detect pathogens in food industry.

a) Antigens

b) Chemicals

c) Toxins

**d) Antibodies**

72. Naturally occurring proteins in organism that induces motion are called\_\_\_\_\_\_\_\_\_\_

**a) Molecular motors**

b) Cytoskeleton

c) Plasma proteins

d) Cell membrane

73. The number of catalytic sites present in F1 motor is\_\_\_\_\_\_\_\_\_\_

a) 2

**b) 3**

c) 4

d) 5

74. The average ATP production per second by ATP synthase is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**a) Above 100**

b) Above 200

c) Above 300

d) Above 400

75. Axonemal dyneins are involved in

a) moving ions

**b) producing bending motions of cilia and flagella.**

c) moving proteins

d) cargo movement

76. If tuff of flagella present in one side of bacteria it is called as

a) Amphitrichous

b) Monotrichous

c) peritrichous

**d) lophotrichous**

**77.** In Pregnancy test biosensor detects the -------in urine

a) creatine

**b) hCG protein**

c) albumin

d) glucose

**PART – B**

1. What are molecular machines?
2. What are the types of bacterial flagellum?
3. What is meant by F0 and F1?
4. What is cytoskeleton?
5. What is meant by coupling coordination motor?
6. How the biosensor detects the pollutants?
7. Discuss the flagellar motor structure with diagrammatic representation.
8. Write about ATP synthase.
9. What is the function of myosin motor?
10. Write about the role of kinesin and dynein motor?
11. Draw the structure of bacterial flagellar arrangements.
12. Define bioventing and bio augmentation
13. Write the significance of glucose biosensor.
14. What are the functions of myosin molecular motors?
15. Explain Dynein motor.
16. How the biosensor detects the pollutants.
17. Write down the functions of cytoskeleton.
18. How does ATP motor works?
19. What is kinesin motor and explain with structure.

**PART- C**

1. Describe detailed on molecular machines.
2. Explain in detailed about ATP synthase motor with neat diagram.
3. Explain the structure and functions of bacterial flagellar motor.
4. Discuss the various structural aspects of cytoskeleton.
5. Short notes on Dynein and Kinesin motors with structure.
6. Explain about Myosin motor and its function in muscle movement.
7. What is bioremediation? Explain the factors determining bioremediation.
8. Short notes on biosensor and explain various types of biosensor.