Biology Section - I

Straight Objective Type

Biology contains 90 multiple choice questions numbered 1 to 90. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

I. Choose the correct answer:

1. The smallest organelle in the cell is
   (A) Lysosome (B) Mitochondria (C) Ribosome (D) Peroxisome

2. Bacterial genome or nucleoid is made up of
   (A) A circular double-stranded DNA (B) A linear single stranded RNA
   (C) A circular double stranded DNA or RNA (D) A linear double stranded DNA or RNA

3. Two animal cells are interconnected by
   (A) Plasmodesmata (B) Cell wall (C) Desmosome (D) Plasma membrane

4. The pair correctly matched in regard to a cell organelle and its function is
   (A) Ribosome – synthesis of protein (B) Endoplasmic reticulum – production of ATP
   (C) Golgi bodies - hereditary informations (D) Mitochondria – destroys foreign substance

5. Which of the following is associated with the detoxification of drugs and muscle contraction by the release and uptake of Ca^{2+} ions?
   (A) Golgi complex (B) RER (C) SER (D) Free ribosomes

6. The main organelle involved in the modification and routing of newly synthesized protein to their destination is
   (A) Chloroplast (B) Mitochondria (C) Lysosome (D) Golgi complex

7. RER is well developed in cells engaged in the synthesis of
   (A) Nucleotides (B) Proteins (C) Lipids (D) Secretory products

8. Golgi apparatus is specialized for all except
   (A) Glycosidation and glycosylation of lipids and proteins
   (B) Recycling of the plasma membrane pinched off by pinocytosis and phagocytosis
   (C) Secretion
   (D) Intracellular digestion

Space for Rough Work

9. Which of the following is likely to show the absence of lysosomes?
   (A) Mammalian Erythrocytes (B) Protozoa
   (C) Frog erythrocytes (D) Mammalian leucocytes

10. Which of the following organelles possess oxidases and are associated with oxidation reaction other than those of respiration?
   (A)Spherosomes (B) Peroxisomes (C) Lysosomes (D) Golgi

11. Peroxisomes contain peroxide-producing enzymes. These are found in
   (A) Plant cells (B) Animal cells
   (C) Both (A) and (B) (D) Bacteria and blue green algae

12. Which of the following clues will tell you whether a cell is prokaryotic or eukaryotic?
   (A) Presence or absence of a rigid cell wall (B) Whether or not a cell has nucleus
   (C) Presence or absence of a plasma membrane (D) Whether or not a cell produces protein

13. Protein synthesis in an animal cell occurs
   (A) Only on the ribosomes present in the cytosol
   (B) Only on ribosomes attached to the nuclear envelope and ER
   (C) On ribosomes present in the cytoplasm and in ER
   (D) On ribosomes present in the nucleolus as well as in cytoplasm

14. Mitochondria and chloroplasts are semi-autonomous as they possess
   (A) DNA (B) DNA + RNA
   (C) DNA + RNA + ribosomes (D) Proteins

15. Choose the best definition of diffusion
   (A) Passive movement from an area of greater concentration to one of lesser concentration
   (B) Active movement from an area of greater concentration to one of lesser concentration
   (C) Passive movement from an area of lesser concentration to one of greater concentration
   (D) Active movement from an area of lesser concentration to one of greater concentration

16. Traffic police of a cell is
   (A) Endoplasmic reticulum (B) Golgi apparatus (C) Cell membrane (D) Mitochondria

17. Which of the following could be found in both the nucleus and cytoplasm?
   (A) Nucleolus (B) Ribososmes
   (C) RNA (D) Both RNA and ribosomes

Space for Rough Work

18. Mitochondria are not found in
(A) Mature WBC (B) Mature RBC (C) Nerve cell (D) Sperm

19. Grana in chloroplast is formed by the piling of
(A) Cristae (B) Thylakoids (C) Oxisomes (D) Dictyosomes

20. The outer most layer in an onion cell as observed in the temporary mount of an onion peel is the
(A) Plasma membrane (B) Cell wall (C) Nuclear membrane (D) Capsid

21. The barrier between the protoplasm and outer environment in an animal cell is
(A) Cell wall (B) Plasma membrane (C) Nuclear membrane (D) Cytoplasm

22. A cell 'X' contain a cell wall, large central vacuole and a nucleus at the periphery. The cell 'X' is
(A) Plant cell (B) Animal cell (C) Prokaryotic cell (D) Virus

23. Who was the first to explain that the cells divide and new cells are formed form the pre-existing cells (omnis cellula-e-cellula) is 1855?
(A) Louis Pasteur (B) Rudolf Virchow (C) Carle Wilhelm von Nagali (D) Robert Brown

24. The prokaryotic cells are characterized by
(A) Distinct chromosome
(B) Absence of chromatin material
(C) Absence of nuclear membrane
(D) Both B and C

25. Raisins soaked in low concentrated solution of sugar **(i)** . The process involved is known as **(ii)**
(A) (i) – shrinks (ii) –Endosmosis
(B) (i) – swells (ii) -Exosmosis
(C) (i) – shrinks (ii) –Exosmosis
(D) (i) – swells (ii) -Endosmosis

26. Fibers are obtained from
(A) Xylem, phloem, and sclerenchyma
(B) Xylem, phloem, sclerenchyma, and epidermis
(C) Xylem, parenchyma, epidermis
(D) Xylem, parenchyma, endodermis

27. Cambium of the root is an example of
(A) Meristematic tissue
(B) Simple permanent tissue
(C) Complex permanent tissue
(D) All of these

Space for Rough Work

28. Parenchyma : simple, Phloem :
(A) Simple (B) Complex (C) Collenchyma (D) Xylem

29. Parenchymatous tissue is characterized by the
(A) Presence of uniform thickening
(B) Presence of thickening in the corners
(C) Presence of intercellular spaces
(D) Presence of lignified walls

30. The difference in the phloem of gymnosperms and angiosperms is due to ?
(A) Parenchyma (B) Sieve cell (C) Companion cell (D) Fibers

31. Which of the following are simple tissues
(A) Parenchyma, xylem, and phloem
(B) Parenchyma, collenchyma, and sclerenchyma
(C) Parenchyma, xylem, and collenchyma
(D) Parenchyma, xylem, and sclerenchyma

32. Aerenchyma is helpful in plants by
(A) Providing buoyancy in hydrophytes
(B) Promoting photosynthesis
(C) Giving mechanical strength to plants
(D) Giving flexibility to plants

33. Senescence and death are essential in the functioning of
(A) Sieve tubes
(B) Companion cells
(C) Both (A) and (B)
(D) Xylem and sclerenchyma cells

34. Which of the following statements given below is correct about meristematic tissue ?
(A) Is made up of cells incapable of cell division
(B) Is made up of cells capable of cell division
(C) Is composed of dead cells
(D) Is composed of more than one type of cells

35. You are given 2 slides – parenchyma and meristematic tissues. Meristematic tissue can be identified by
(A) Absence of intercellular spaces
(B) Presence of intercellular spaces
(C) Presence of large vacuole
(D) All of these

36. Compound squamous epithelium occurs in
(A) Stomach (B) Pharynx (C) Intestine (D) Trachea

37. Epithelium of bronchioles is
(A) Simple cuboidal
(B) Pseudostratified columnar
(C) Simple squamous
(D) Pseudostratified sensory

38. The inner lining of gut, stomach, and liver is made of
(A) Simple squamous epithelium
(B) Simple columnar epithelium
(C) Simple cuboidal epithelium
(D) All the above

Space for Rough Work

39. Characteristic of epithetlial tissues is
(A) Absence of nucelus
(B) Cells can undergo rapid divisions
(C) Abundant vascularization
(D) Large intercellular spaces

40. Mammary glands are modified
(A) Sweat gland (B) Sebaceous gland (C) Lacrymal gland (D) Endocrine gland

41. Haversian canal is situated in
(A) Glandular connective tissue
(B) Skeletal connective tissue
(C) Fibrous connective tissue
(D) Nervous tissue

42. Tendons and ligaments are specialized types of
(A) Nervous tissue
(B) Epithelial tissue
(C) Muscular tissue
(D) Fibrous connective tissue

43. Minimum regeneration power is present in
(A) Nervous tissue (B) Connective tissue (C) Epithelial tissue (D) None of these

44. Which of the following cells of connective tissue secrete antibodies?
(A) Mast cells (B) Reticular cells (C) Adipose cells (D) Plasma cells

45. The main function of ligament is
(A) Joining of two bones
(B) Joining of muscles
(C) Joining of muscle to bone
(D) Joining of muscle to nerves

46. The type of epithelium found in the conjunctiva of eye is
(A) Stratified cuboidal
(B) Stratified columnar
(C) Stratified squamous
(D) Transitional epithelium

47. Volkmann canals are found in
(A) Bones of birds
(B) Bones of amphibians
(C) Bones of mammals
(D) Cartilage of mammals

48. A person met with an accident in which two long bones of hand are dislocated. Which among the following may be the possible reason?
(A) Tendon tear
(B) Skeletal muscle tear
(C) Ligament tear
(D) Destruction of nerve

Space for Rough Work

49. Which of the following is enucleate?
(A) Squamous epithelial cell (B) Mature human erythrocyte
(C) Mature human leukocyte (D) Mature frog erythrocyte

50. Mammalian pinna is supported by
(A) Hyaline cartilage (B) Calcified cartilage
(C) Elastic cartilage (D) White fibrous connective tissue

51. A breed of cow that is used for cross breeding in our country
(A) Jersey (B) Holtstein-Friesian (C) Sahiwal (D) All of these

52. The disease that is caused by a virus is
(A) amoebiosis (B) anthrax (C) rabies (D) ringworm

53. The fastest growing carp is
(A) Catla (B) Rohu (C) Mrigal (D) Silver carp

54. Murrah, Surti and Mehsana are different breeds of
(A) cows (B) buffaloes (C) goats (D) sheep

55. Developing embryo from a superior breed is transferred into the uterus of a female with inferior characteristics by the process of
(A) hybridization (B) artificial insemination
(C) embryo transfer (D) random mating

56. Inland fisheries refers to
(A) culturing fish in freshwater (B) trapping and capturing fishes from sea coast
(C) deep sea fisheries (D) extraction of oil from fishes

57. The Jersey bull used for cross breeding is an exotic variety from
(A) England (B) Scotland (C) Switzerland (D) Holland

58. An exotic breed of poultry bird having high egg laying capacity is
(A) White Leghorn (B) Broilers (C) White Cornish (D) New Hampshire

Space for Rough Work

59. The fungal disease causing maximum death of a poultry bird is
(A) coryza (B) pullorium (C) rickets (D) asperigillosis

60. The method used maximum in cattle breeding is
(A) random mating (B) artificial insemination
(C) controlled breeding (D) super ovulation and embryo transfer

61. Induced breeding can be exploited to increase the production of
(A) camels (B) horses (C) fish (D) cows

62. Which is not a complex fertilizer?
(A) Potassium sulphate (B) Calcium ammonium nitrate
(C) Triple super phosphate (D) Urea ammonium phosphate

63. Pick the odd one out.
(A) Milch animals (B) Murrah (C) Jersey (D) Broilers

64. The science of vegetable culture is called
(A) agriculture (B) horticulture (C) Olericulture (D) floriculture

65. The element which is required in largest quantity by plants is
(A) sulphur (B) calcium (C) nitrogen (D) phosphorus

66. Application of nitrogenous manure to a plant causes
(A) growth retardation due to toxicity of ammonia (B) early flowering
(C) early fruiting (D) vigorous vegetative growth

67. Rotation of crops is essential for
(A) getting different kinds of crops (B) increasing quality of minerals
(C) increasing fertility of soil (D) increasing quality of proteins

68. Which of the following is not a sustainable agriculture technique?
(A) Mixed farming (B) Slash and burn farming
(C) Crop rotation (D) Crop selection

Space for Rough Work

69. Which of the following is not a characteristic of mixed cropping?
(A) Minimises risk of crop failure
(B) Set pattern of rows
(C) Harvesting and threshing of crops separately is not possible
(D) Individual marketing and consumption of crop is not possible

70. If a plant breeder wants to develop a disease-resistant variety, what should he do first ?
(A) Mutation (B) Selection (C) Hybridization (D) Production of crop

71. In respect of water crisis, there have been conflicts/disputes between two countries, or states of the same country. Which of the following has never been the case of water conflict?
(A) Cauvery water dispute between Tamil Nadu and Karnataka
(B) Yamuna-Betwa dispute between U.P. and M.P.
(C) Sutlej Yamuna Link (SYL) canal dispute between Punjab and Haryana
(D) Jordan, Tigris-Euphrates, and Nile river basins dispute among Jordan, Syria and Israel

72. The method of rainwater harvesting which can be adopted by individual house owners is
(A) Construction of recharge trenches (B) On channel storage of water
(C) Creation of new water bodies (D) Roof-top rainwater harvesting

73. Which one of the following is not an ideal solution for tackling water shortages?
(A) Controlling population growth (B) Conserving water in irrigation
(C) Controlling water pollution (D) Drilling large number of deep bore wells

74. Which of the following is not a method for water conservation?
(A) Rainwater harvesting (B) Groundwater extraction
(C) Improving irrigation efficiency (D) Avoiding water wastage

75. Fossil fuel and metallic minerals are:
(A) Renewable resource (B) Inexhaustible resources
(C) Non-renewable resources (D) None of these

76. Khetri (Rajasthan) is famous for:
(A) Coal mines (B) Copper mines (C) Granite stone (D) Marble stone

Space for Rough Work

77. Which of the following statements about the forest is not correct?
(A) Forest reduces soil erosion
(B) Provides recreational opportunities
(C) Provides economic development
(D) None of the above

78. Forest and wild life are
(A) Renewable resource
(B) Non-renewable resources
(C) Inexhaustible resources
(D) None of these

79. Which of the following is not true about deforestation?
(A) Population explosion is one of the reasons for deforestation.
(B) Cleaning of forest for agriculture causes deforestation.
(C) Deforestation is taking place only in developing courtiers.
(D) Cash crop economy of third world is a cause of deforestation.

80. Which of the following is not a viable protection against deforestation?
(A) Reduce the consumption of forest and related products
(B) Boycott products of companies involve in deforestation
(C) Privatisation of forest land
(D) Environmental education

81. The major cause for land degradation in our country is
(A) Soil erosion
(B) Pollution of soil
(C) Water-logging
(D) None of the above

82. The stakeholders of forests causing the maximum damage to forest is
(A) People who live in or around the forest
(B) The industrialists
(C) The wildlife and native enthusiasts
(D) The forest department of the government

83. Amirata Devi Bishnoi scarified her life for the protection of
(A) Sal trees
(B) Pine trees
(C) Khejri trees
(D) Alpine meadows

84. The Indira Gandhi Canal has brought greenery to
(A) Considerable areas of Tamil Nadu
(B) Considerable areas of Jodhpur
(C) Considerable areas of Rajasthan
(D) None of these

Space for Rough Work

85. The protests Narmada Bachao Andolan is about
    (A) Save the Narmada Movement
    (B) Save the Narmada
    (C) Raising height of Sardar Sarovar Dam on the river Narmada
    (D) Raising height of dam on the river

86. The problems for criticism about large dams are
    (A) Displace large number of peasants and trebles without proper rehabilitation
    (B) Swallow up huge amounts of public money without the generation of proportionate benefits
    (C) Contribute enormously to deforestation and the loss of biological diversity
    (D) All of the above

87. Chipko Andolan is the
    (A) Conservation of natural resources
    (B) Development of new breeds of forest plants
    (C) Zoological survey of India
    (D) Forest conservation

88. Measure of biodiversity of an area is the
    (A) Number of species found there
    (B) Range of different life forms
    (C) Both (A) and (B)
    (D) Only (A)

89. Which of the following is correct, if we only achieve two out of three pillars of Sustainable Development?
    (A) Social + Economic Sustainability = Equitable
    (B) Social + Environmental Sustainability = Bearable
    (C) Economic + Environmental Sustainability = Viable
    (D) All of the above

90. Ozone hole means
    (A) A large sized hole in the ozone layer
    (B) Thinning of ozone layer
    (C) Small holes scattered in the ozone layer
    (D) Thickening of ozone layer

Space for Rough Work

Physics Section - II

Straight Objective Type

Physics contains 45 multiple choice questions numbered 1 to 45. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. A body of mass 1kg is attracted by the earth with a force which is equal to
   (A) 9.8N (B) 6.67×10^{-11} N (C) 1 N (D) 98 N

2. What is the gravitational force between two objects?
   (A) attractive at large distances only
   (B) attractive at small distances only
   (C) attractive at all distances
   (D) attractive at large distances but repulsive at small distances

3. The value of 'g'
   (A) Increases as we go above the earth's surface (B) Decreases as we go to the centre of the earth
   (C) Remains constant (D) Is more at equator and less at poles

4. A particle starts from rest and experiences a constant acceleration for 6 seconds. If it travels a distance d_1 in the first two seconds, a distance d_2 in the next two seconds and a distance d_3 in the last two seconds, then:
   (A) $d_1 : d_2 : d_3 = 1:1:1$ (B) $d_1 : d_2 : d_3 = 1:2:3$
   (C) $d_1 : d_2 : d_3 = 1:3:5$ (D) $d_1 : d_2 : d_3 = 1:3:5$

5. The gravitational force causes
   (A) Tides (B) Motion of moon
   (C) Motion of an electron around nucleus (D) Both (A) and (B)

6. The mass of the body on moon is 40kg, what is the weight on the earth.
   (A) 240kg (B) 392N (C) 240N (D) 400kg

7. Newton's law of gravitation applies to
   (A) Small bodies only (B) Plants only
   (C) All bodies irrespective of their size (D) For solar system

Space for Rough Work

8. The gravitational force between two objects is F. If masses of both the objects are halved without altering the distance between them, then the gravitational force would become
(A) f/4 (B) f/2 (C) f (D) 2f

9. The Earth attracts the moon with a gravitational force of 1020N. The moon attracts the earth with a gravitational force of
(A) Less than 1020N (B) 1020N
(C) Greater than 1020N (D) None of these

10. The distance between two bodies becomes 6 times more than the usual distance. Then the F becomes
(A) 36 times (B) 6 times (C) 12 times (D) 1/36 times

11. Find the average speed of a bicycle if it completes two round of a circular track of radius 140m twice in 5min 52 sec.
(A) 10m/s (B) 5m/s (C) 2m/s (D) 4m/s

12. A driver applies brakes on seeing a traffic signal 400 m ahead. At the time of applying the brakes of vehicle was moving with 15 m/s and retarding with 0.3 m/s^2. The distance of vehicle after 1 min from the traffic light is
(A) 25 m (B) 375 m (C) 360 m (D) 40 m

13. A body A starts rest with an acceleration a_1. After 2 seconds, another body B starts from rest with an acceleration a_2. If they travel equal distances in the 5^{th} second after the start of A, then the ratio $a_1 : a_2$ is equal to
(A) 5 : 9 (B) 5 : 7 (C) 9 : 5 (D) 9: 7

14. A physical quantity which cannot be negative is
(A) displacement (B) velocity (C) acceleration (D) distance

15. A person moves from point O in a straight line to a point X which is at 50m from O, and return from X to point Y in the direction XO at a distance 20m from X. What is the displacement made by the person
(A) 50m (B) 80m (C) 20m (D) 30m

16. When a body covers unequal distances in equal intervals of time, it is said to be in
(A) linear motion (B) uniform motion (C) non-uniform motion (D) vibratory motion

Space for Rough Work

17. A body starts from rest with a uniform acceleration of 2 m/s^2 for 10 sec then it moves in constant speed for 30 sec then decelerates by 4 m/s^2 to zero. What is the distance covered by the body?
(A) 750 m (B) 850 m (C) 600 m (D) None of these

18. Which of the following is vector quantity?
(A) Distance (B) Displacement (C) Velocity (D) Both B and C

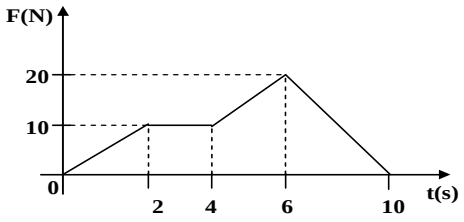
19. A bus moves from stop 'A to stop 'B' with a speed of 40 km/hr and then from stop 'B' to stop 'A with a speed of 50 km/hr. Its average speed is
(A) 48.5 km/hr (B) 44 km/hr (C) 45 km/hr (D) 44.4 km/hr

20. Area under velocity-time gives
(A) displacement (B) acceleration (C) velocity (D) time

21. Displacement-time graph of a uniformly accelerated motion is
(A) parabola (B) straight line (C) an inclined line (D) none

22. A car with speed 72km/hr suddenly applies break. The break has maximum ability to decelerate with $5ms^{-2}$. Find time taken to stop the car after applying breaks?
(A) 2sec (B) 3sec (C) 4sec (D) 5sec

23. A particle of mass 2 kg is initially at rest. A force acts on its whose magnitude changes with time. The force-time graph is shown in figure. The velocity of the particle after 10 s is:
(A) 20 ms^{-1} (B) 10 ms^{-1}
(C) 20 ms^{-1} (D) 26 m/s^{-1}



24. In uniform circular motion, velocity of the particle is
(A) constant (B) variable in magnitude
(C) variable in direction (D) both A and B

Space for Rough Work

25. Velocity of a particle increases from 10 m/s to 15 m/s after travelling a distance of 5 metre. Its acceleration is
(A) 12.5 m/s^2 (B) 125 m/s^2 (C) 1.25 m/s^2 (D) 0.125 m/s^2

26. An object of mass 5 kg is attached to the hook of a spring balance is suspended vertically from the roof of a lift. The reading on the spring balance when the lift is going up with an acceleration of 0.25 ms^{-2} is: ($g = 10ms^{-2}$)
(A) 51.25 N (B) 48.75 N (C) 52.75 N (D) 47.25 N

27. A particle starts moving from the position of rest under a constant acceleration. It travels a distance x in the first 10 sec and distance y in the next 10 sec, then :
(A) y = x (B) y = 2x (C) y = 3x (D) y = 4x

28. A body sliding on a smooth inclined plane requires 4 sec to reach the bottom starting from rest at the top. How much time does it take to cover one-fourth the distance starting from rest at the top?
(A) 1 s (B) 2 s (C) 4 s (D) 16 s

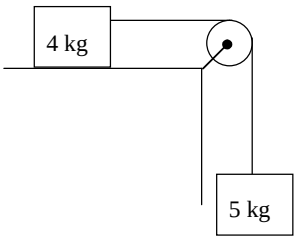
29. An object is projected upwards with a velocity of 4.9 m/s. It will strike the ground in approximately :
(A) 2 s (B) 1 s (C) 1.5 s (D) 0.5 s

30. A car travelling at a speed of 30 km/hr is brought to a halt in 8 m by applying brakes. If the same car is travelling at 60 km/hr it can be brought to a halt with the same breaking force in :
(A) 8 m (B) 16 m (C) 24 m (D) 32 m

31. A body falls from rest freely under gravity with an acceleration of 9.8 m/s^2. Neglecting air resistance, the distance travelled by the body during the third second of its motion will be :
(A) 14.7 m (B) 24.5 m (C) 19.6 m (D) 29.4 m

32. A body of mass 2 kg moving on a horizontal surface with an initial velocity of 4 m/s comes to rest after 2 sec. If one wants to keep this body moving on the same surface with a velocity of 4 m/s, the force required is :
(A) 8 N (B) 4 N (C) zero (D) 2 N

33. Two masses of 4 kg and 5 kg are connected by a string passing through a frictionless pulley and are kept on a frictionless table as shown below. Then the acceleration of the system is
(A) 49 m/s^2 (B) 5.44 m/s^2
(C) 19.5 m/s^2 (D) 2.72 m/s^2



Space for Rough Work

34. A ball of mass 2 kg is moving with a velocity $6ms^{-1}$ collides with other ball of mass of 4 kg moving with $3ms^{-1}$ in the same direction. The common velocity of the objects if they move together after collision
(A) $2\ ms^{-1}$ (B) $3\ ms^{-1}$ (C) $4\ ms^{-1}$ (D) $5\ m/s^{-1}$

35. The average resisting force that must act on a 5 kg mass to reduce its speed from 65 cm/s to 15 cm/s in 0.2 is
(A) 12.5 N (B) 25 N (C) 50 N (D) 100 N

36. A boy having a mass equal to 40 kilograms is standing in an elevator. The force felt by the feet of the boy will be greatest when the elevator (g = 9.8 metres/sec ^{2})
(A) Stands still
(B) Moves downward at a constant velocity of 4 metres /sec
(C) Accelerates downward with an acceleration equal to 4 metres/sec^2
(D) Accelerates upward with an acceleration equal to 4 metres/sec^2

37. A block of mass 5 kg is moving horizontally at a speed of 1.5 m/s. A perpendicular force of 5 N acts on it for 4 sec. What will be the distance of the block from the point where the force started acting
(A) 10 m (B) 8 m (C) 6 m (D) 2 m

38. The ratio of the weight of a man in a stationary lift and when it is moving downward with uniform acceleration 'a' is 3 : 2. The value of 'a' is (g – acceleration due to gravity of the earth)
(A) $\frac{3}{2}g$ (B) $\frac{g}{3}$ (C) $\frac{2}{3}g$ (D) g

39. A gun fires N bullets per second, each of mass m with velocity v. The force exerted by the bullets on the gun is
(A) mvN (B) $\frac{mv}{N}$ (C) mv N^2 (D) $\frac{mv^2}{N}$

Space for Rough Work

40. A ball of mass 2 kg is moving with a velocity 6 ms^{-1} collides with other ball of mass of 4 kg moving with 3 m/s^{-1} in the opposite direction. The common velocity of the objects if they move together after collision
(A) 2 m/s^{-1} (B) 3 m/s^{-1} (C) 4 m/s^{-1} (D) 5 m/s^{-1}

41. The gravitational force F_g between two objects does not depend on
(A) Sum of the masses (B) Product of the masses
(C) Gravitational constant (D) Distance between the masses

42. A block of mass 0.2 kg is suspended from the ceiling by a light string. A second block of mass 0.3 kg is suspended from the first block through another string. The tension in the two strings is
(Take g = 10 m/s^2)
(A) 1 N and 2 N (B) 2 N and 3 N (C) 5 N and 3 N (D) 10 N and 2 N

43. Which force in nature exits every where
(A) Nuclear force (B) Electromagnetic force
(C) Weak force (D) Gravitation

44. 5 gm bullet acquires a speed of 120 ms^{-1} in a gun with barrel of length 2.0 m. The average force exerted on the bullet is
(A) 3.6 N (B) 36 N (C) 72 N (D) 18 N

45. A 150 m long train is moving to north at a speed of 10 m/s. A parrot flying towards south with a speed of 5 m/s crosses the train. The time taken by the parrot the cross to train would be
(A) 30 s (B) 15 s (C) 8 s (D) 10 s

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Chemistry Section - III

Straight Objective Type

Chemistry contains 45 multiple choice questions numbered 1 to 45. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. Which state is in maximum abundance in universe?
   (A) solid (B) liquid (C) gas (D) plasma

2. During the conversion of solid to liquid state, the temperature of the system
   (A) remains constant (B) increases
   (C) decreases (D) can decrease or increase

3. Evaporation is faster in
   (A) Dry air (B) Humid air (C) winter (D) none

4. Which of the following is found in liquid state?
   (A) Iron (B) copper (C) Aluminium (D) Bromine

5. Sugar solution is an example of
   (A) compound (B) element
   (C) Homogenous mixture (D) metal

6. The substance that tarnishes silver is
   (A) Hydrogen sulphide (B) water (C) carbon dioxide (D)nitrogen dioxide

7. Smoke is a /an
   (A) Aerosol (B) emulsion (C) gel (D)foam

8. The gas that turns lime water milky is
   (A) Argon (B) nitrogen (C) carbon dioxide (D)oxygen

9. Which is the building block of living things?
   (A) carbon (B) carbon dioxide (C) nitrogen (D)argon

10. By what method nitrogen, oxygen and argon could be separated from air?
    (A) Distillation (B) Crystallisation (C) Evaporation (D)Fractional distillation

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11. Which is the densest layer of atmosphere?
(A) Troposphere (B) Stratosphere (C) Mesosphere (D) Thermosphere

12. Which is not a pollutant?
(A) Oxides of carbon (B) oxides of nitrogen (C) sulphur dioxide (D) nitrogen

13. Which noble gas is present in high amount in air?
(A) Helium (B) neon (C) argon (D) krypton

14. The boiling point of nitrogen is
(A) -186°C (B) -183°C (C) -32°C (D) -196°C

15. Which is a poisonous gas?
(A) Carbon dioxide (B)carbon monoxide (C) sulphur dioxde (D)oxygen

16. Milk turns into curd by the action of enzymes. This reaction is called
(A) Fermentation (B)combination (C)neutralization (D)addition

17. The reaction used to control the acidity of stomach is
(A)Oxidation (B)reduction (C)neutralization (D)dehydration

18. The boiling point of impure substance is usually
(A) Greater than that of pure substance (B)less than that of pure substance
(C)equal to that of pure substance (D)none of the above

19. Which one of the following is not a mixture?
(A) Distilled water (B) Sugar dissolved in water
(C) Liquefied petroleum gas (L.P.G) (D) Gasoline

20. The rusting of iron is
(A) dehydration (B) displacement (C) Redox (D) reduction

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21. When sodium nitrate is dissolved in water, the temperature of water falls down. This change is called
(A) endothermic (B)exothermic (C)chemical change (D)no change

22. A mixture of miscible liquids can be separated by
(A) filtration (B) sedimentation
(C) distillation (D) using separating funnel

23. Which of the following is not a chemical change?
(A) photosynthesis (B) rusting of iron
(C) tarnishing of silver (D) sublimation of camphor

24. 29.25 g of NaCl is dissolved in 1000 ml of water. What is the molarity of solution?
(Atomic mass of Na = 23u, Cl = 35.5u)
(A) 0.5 (B) 1 (B) 2 (C) 3

25. Pressure cooker reduces cooking time because:
(A) The heat is more evenly distributed inside the cooker (B) A large flame is used
(C) boiling point of water is elevated (D) whole matter is converted into steam

26. The solubility of a substance is defined as the amount of solute in grams _____ at a given temperature
(A) present in 100 g of the solvent (B) present in 100g of the solution
(C) present in 100 mL of the solution (D) present in 1 litre of the solution

27. What factor distinguishes a suspension from a colloid?
(A) light reflects off the particles of a suspension
(B) the particles of a suspension will sink out if left over time to rest
(C) suspensions are clear
(D) suspensions cannot be filtered

28. An example of an emulsifying agent would be__
(A) oil (B) soap (C)water (D)salt

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29. An example of a homogeneous mixture is___
(A) sand and water (B) flour and water
(C) salt dissolved in water (D) oil and water

30. Which statement is not true.?
(A) particles in a colloid will reflect light (B) the particles of a solution are smaller in size
(C) a suspension can be filtered (D) a solution can be filtered

31. Which statement is true about Brownian motion?
(A) Brownian motion is caused by collisions with molecules of the surrounding medium
(B) Brownian motion is the random movement of colloid particles
(C) Brownian motion may be used to distinguish between solutions and colloids
(D) all of the above

32. What type of change is observed when milk sours?
(A) a physical (B) both physical & chemical
(C) a chemical (D) none of the above

33. The statement, "Mass can neither be created nor destroyed" is the _____.
(A) law of gravity (B) law of multiple proportions
(C) law of conservation of mass (D) law of conservation of energy

34. In the following chemical reaction, how do you classify hydrogen and oxygen?
$2H_2 + O_2 \rightarrow 2H_2O$
(A) reactants (B) physical changes (C) products (D)chemical properties

35. A material that cannot be broken down further by chemical means is a(n) _____.
(A) substance (B) compound (C) mixture (D) element

36. Which of the following is not a state of matter?
(A) gas (B) solid (C) liquid (D) density

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37. Which of the following is not a chemical change?
(A) rusting of iron (B) freezing of water
(C) burning a piece of wood (D) placing iron in hydrochloric acid and producing hydrogen gas

38. The metal which can melt in your palm
(A) Mercury (B) Bromine (C) Gallium (D) Potassium

39. A technique that uses a porous barrier to separate heterogeneous mixtures of solid in liquid is _____.
(A) crystallization (B) distillation (C) filtration (D) chromatography

40. Elements on the left side of the periodic table are _____.
(A) nonmetals (B) metals (C) metalloids (D) compounds

41. A characteristic that can be observed or measured without changing the sample's composition is _____.
(A) a gaseous property (B) a chemical property
(C) a crystalline property (D) a physical property

42. What is the mass percent of the components of water?
(A) 33% H, 67% O (B) 89% H, 11% O (C) 11% H, 89% O (D) 67% H, 33% O

43. A solution of solids is a(n)_____.
(A) pure metal (B) alloy
(C) filtration (D) heterogeneous mixture

44. Which of the following is a compound?
(A) steel (B) crude oil (C) neon (D) water

45. A technique that uses the differences in boiling point to separate homogeneous mixtures is _____.
(A) filtration (B) distillation (C) chromatography (D) crystallization

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