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.

1. In which part of the alimentary canal food is finally digested and absorbed?
   (A) Stomach (B) Mouth cavity (C) Large intestine (D) Small intestine

2. In human males, the testes are present in the scrotum, because it helps in the
   (A) Process of mating (B) formation of viable sperms
   (C) easy transfer of gametes (D) all the above

3. The shape of guard cells changes due to change in the
   (A) Protein composition of cells (B) Temperature of cells
   (C) Amount of water in cells (D) Position of nucleus in the cells

4. In human digestive system, the enzymes pepsin and trypsin are secreted respectively by:
   (A) Pancreas and liver (B) Stomach and salivary glands
   (C) Pancreas and gall bladder (D) Stomach and pancreas

5. Iodine is necessary for the synthesis of which hormone?
   (A) Adrenaline (B) Thyroxin (C) Auxin (D) Insulin

6. When air is blown from mouth into test-tube containing lime water, the lime water turns milky due to the presence of:
   (A) Oxygen (B) carbon dioxide (C) nitrogen (D) water vapour

7. Posture and balance of the body is controlled by
   (A) Cerebrum (B) cerebellum (C) medulla (D) pons

8. The correct sequence of anaerobic reactions in yeast is
   (A) $\text{Glucose} \xrightarrow{\text{cytoplasm}} \text{Pyruvate} \xrightarrow{\text{mitochondria}} \text{Ethanol} + \text{carbon dioxide}$
   (B) $\text{Glucose} \xrightarrow{\text{cytoplasm}} \text{Pyruvate} \xrightarrow{\text{cytoplasm}} \text{Lactic acid}$
   (C) $\text{Glucose} \xrightarrow{\text{cytoplasm}} \text{Pyruvate} \xrightarrow{\text{cmitochondria}} \text{Lactic acid}$
   (D) $\text{Glucose} \xrightarrow{\text{cytoplasm}} \text{Pyruvate} \xrightarrow{\text{cytoplasm}} \text{Ethanol} + \text{carbon dioxide} + \text{Energy(less amount)}$

9. Vegetative propagation refers to formation of new plants from
   (A) Stem, roots and flowers (B) stem, roots and leaves
   (C) Stem, flowers and fruits (D) stem, leaves and flowers

Space for rough work

10. One of the following is not a constituent of blood. This one is:
(A) red blood cells (B) white blood cells (C) sieve plates (D) Platelets

11. Dwarfism results due to
(A) Excess secretion of thyroxin (B) Less secretion of growth hormone
(C) Less secretion of adrenaline (D) Excess secretion of growth hormone

12. Which of the following has the longest small intestine?
(A) Carnivore (B) omnivore (C) herbivore (D) none of these

13. The movement of shoot towards light is
(A) Geotropism (B) hydrotropism (C) chemotropism (D) phototropism

14. The stimulus in the process of thigmotropism is:
(A) Touch (B) gravity (C) light (D) chemical

15. The filtration units of kidneys are called
(A) Ureter (B) urethra (C) neurons (D) nephrons

16. The site of Dark reaction of photosynthesis is
(A) grana (B) stroma (C) thylakoids (D) Both (a) and (b)

17. Chemicals which are released at the synaptic junction are called
(A) Plasma (B) Neurotransmitters (C) Cerebrospinal fluid (D) Lymph

18. Wax gland present in the ear canal is called
(A) Sweat gland (B) Prostate gland (C) Cowper's gland (D) Ceruminous gland

19. Reproduction is essential for living organisms in order to
(A) Keep function of important organs
(B) fulfill their energy requirement
(C) Maintain growth
(D) maintain continuity of the species generation after generation

20. The faulty functioning of an endocrine gland can make a person very short or very tall. This gland is
(A) Thyroid (B) pineal (C) adrenal (D) pituitary

21. Which is the first enzyme to mix with food in the digestive tract?
(A) Pepsin (B) cellulose (C) amylase (D) Trypsin

22. Which of the following is an incorrect statement?
(A) Energy is essential for life processes (B) organisms grow with time
(C) Movement of molecules does not take place among cells (D) organisms must repair and maintain their body

Space for rough work

23. The xausative agent of disease kala-*azar* is caused by
(A) Planaria (B) Leech (C) Leishmania (D) Plasmodium

24. The growth of pollen tubes towards ovules is due to
(A) Hydrotropism (B) chemotropism (C) geotropism (D) phototropism

25. In a flower, the parts that produce male and female gametes (germ cells) are
(A) Stamen and anther (B) filament and stigma (C) anther and ovary (D) stamen and style

26. The anther contains:
(A) Sepals (B) ovules (C) carpel (D) pollen grains

27. During respiration exchange of gases take place in
(A) Trachea and larynx (B) alveoli of lungs (C) alveoli and throat (D) throat and larynx

28. One of the following does not have a nucleus upon maturity.
(A) red blood cell (B) white blood cell (C) guard cell (D) epidermal cell

29. The sexually transmitted disease which is caused by bacteria is:
(A) Malaria (B) diarrhea (C) gonorrhoea (D) AIDS

30. Junction between two neurons is called
(A) Cell junction (B) neuro muscular junction
(C) neural joint (D) synapse

31. What prevents backflow of blood inside the heart during contraction?
(A) Valves in heart (B) Thick muscular walls of ventricles
(C) Thin walls of atria (D) all of the above

32. A heterocrine gland is one which
(A) Has two distinct parts
(B) Serves a double function of exocrine and endocrine gland
(C) Produces two types of hormones
(D) Occurs in two places

33. The substance that triggers the fall of mature leaves and fruits from plants is due to
(A) Auxin (B) gibberellins (C) abscisic acid (D) cytokinin

34. Which of the following component of our food is digested by an enzyme which is present in saliva as well as in pancreatic juice?
(A) Proteins (B) fat (C) minerals (D) carbohydrate

Space for rough work

35. In which of the following groups of organism, food materials are broken down outside the body and absorbed?
(A) Mushroom, green plants, amoeba (B) Yeast, mushroom, bread mould
(C) Paramecium, Amoeba, Cuscuta (D) Cuscuta, lice, tapeworm

36. The correct sequence of organs in the male reproductive system for transport of sperms is
(A) Testis $\rightarrow$ vasdeferens $\rightarrow$ urethra (B) testis $\rightarrow$ bartholin's gland $\rightarrow$ urethra
(C) Tesits $\rightarrow$ bartholin's gland $\rightarrow$ ureter (D) testis $\rightarrow$ vasdeferens $\rightarrow$ ureter

37. Lack of oxygen in muscles often leads to cramps in the legs of sprinters. This is due to conversion of pyruvate to:
(A) Ethanol (B) carbon dioxide (C) acetic acid (D) lactic acid

38. Select the mis-matched pair
(A) Adrenaline : Pituitary gland
(B) Testosterone : Testes
(C) Estrogen : Ovary
(D) Thyroxin : Thyroid gland

39. Blood is pumped from the heart to the entire body by the:
(A) Lungs (B) ventricles (C) atria (D) nerves

40. Oxygen liberated during photosynthesis comes from
(A) Water (B) chlorophyll (C) carbon dioxide (D) glucose

41. Offspring formed as a result of sexual reproduction exhibit more variations because
(A) Sexual reproduction is a lengthy process
(B) Genetic material comes from two parents of the same species
(C) Genetic material comes from two parents of different species
(D) Genetic material comes from many parents

42. Two of the following organisms have a holozoic mode of nutrition. These organisms are:
(A) Paramecium and Plasmodium (B) Plasmodium and Parakeet
(C) Parakeet and Amoeba (D) Paramecium and Leishmania

43. The part of the Brain that has the pneumotaxic centre is the
(A) Cerebrum (B) cerebellum (C) pons varoli (D) medulla

44. Which part of alimentary canal stores excess of bile?
(A) Stomach (B) gall bladder (C) Large intestine (D) Oesophagus

45. Descending Loop of Henle is meant for absorption of
(A) Potassium (B) Glucose (C) Water (D) CO_2

Space for rough work

46. The releasing hormones are produced by
(A) Testis (B) Pancreas (C) Pituitary (D)Hypothalamus

47. The types of self pollination includes---------
(A) Autogamy (B) Geitonogamy (C) Cleistogamy (D) All of these

48. Which of the following equations is the summary of photosynthesis?
(A) $6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$
(B) $6CO_2 + H_2O + \text{Sunlight} \rightarrow C_6H_{12}O_6 + O_2 + 6H_2O$
(C) $6CO_2 + 12H_2O + \text{chlorophyll} + \text{sunlight} \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$
(D) $6CO_2 + 12H_2O + \text{chlorophyll} + \text{sunlight} \rightarrow C_6H_{12}O_6 + 6CO_2 + 6H_2O$

49. Characters transmitted from parents to offspring are present in
(A) Cell membrane (B) ribosome (C) Golgi bodies (D) genes

50. Double fertilization is fusion of
(A) Two eggs
(B) Two eggs and polar nuclei
(C) One male gamete with egg and other with synergid
(D) One male gamete with egg and other with secondary nucleus

51. Dramatic changes of body features associated with puberty are mainly because of secretion of
(A) Estrogen from testes and testosterone from ovary
(B) Estrogen from adrenal gland and testosterone from pituitary gland
(C) Testosterone from testes and estrogen from ovary
(D) Testosterone from thyroid gland and estrogen from pituitary gland

52. Which of the following is not a part of the female reproductive system in human beings?
(A) Ovary (B) Uterus (C) Vas deferens (D) Fallopian tube

53. A stamen consists of two parts namely:
(A) Anther and style (B) Anther and filament
(C) Stigma and style (D) Filament and style

54. One of the following is a surgical method in males which prevents the sperms from reaching the ovum and pregnancy does not occur. This method is
(A) IUCD (B) vasectomy (C) condom (D) tubectomy

55. Macrophages are type of
(A) RBCs (B) Neurons (C) WBCs (D) Muscles

Space for rough work

56. The climbing organs of plants like tendrils grow towards any support which they happen to touch and wind around the Support. This is an example of:
(A) Chemotropism (B) nastic movement (C) thigmotropism (D) geotropism

57. In a neuron, granules of rough endoplasmic reticulum (RER) with rosettes of free ribosomes, which carry out protein synthesis are referred to as.
(A) Nodes of Ranvier (B) Nissl's Bodies (C) Myelin sheath (D) axons

58. In spirogyra, asexual reproduction takes places by
(A) Fragmentation (B) Binary fission (C) Sporulation (D) none of these

59. The substance which is not reabsorbed by the nephron is mainly
(A) Glucose (B) water (C) creatinine (D) None of these

60. Hormone inducing fruit ripening is
(A) Ethylene (B) Cytokinin (C) Gibberellic acid (D) Abscisic acid

61. Epiglottis is meant for protecting
(A) Oesophagus from entry of air (B) Nasal chambers from entry of food
(C) the windpipe and the lungs from entry of food (D) Teeth from caries

62. During adolescence, several changes occur in the human body. Mark one change associated with sexual maturation in boys
(A) Loss of libido (B) Cracking of voice (C) loss of limbs (D) all of these

63. In mammals, during inhalation & exhalation movements of lungs are governed by
(A) Muscular wall of lungs (B) Intercostal muscles
(C) Diaphragm (D) Diaphragm and intercostal muscles

64. The bending of the root of a plant away from a source of light is caused by the action of a phytohormone known as:
(A) Cytokinin (B) gibberellin (C) abscisic acid (D) auxin

65. Erythropoietin is a hormone secreted by kidney cells. It stimulates the
(A) Native immunity (B) Blood clotting
(C) RBCs production in bone marrow (D) Acquired immunity

Space for rough work

66. In a sexual reproduction, two off springs having the same genetic material and the same body features are called:
(A) Callus (B) twins (C) clones (D) chromosomes

67. Which of the following is not associated with growth of plant?
(A) Auxin (B) Gibberellins (C) Cytokinins (D) Abscisic acid

68. Dwarfness can be controlled by treating plants with
(A) Cytokinin (B) Gibberellic acid (C) Auxin (D) Anti – gibberellins

69. The movement of sunflower in accordance with the path of sun is due to
(A) Phototropism (B) geotropism (C) chemotropism (D) hydrotropism

70. Branchial respiration is observed in
(A) Fish (B) Earthworm (C) leech (D) Man

71. In human females, an event that reflects onset of reproductive phase is
(A) Growth of nails (B) changes in hair pattern
(C) change in eye colour (D) menstruation

72. Most of the plant hormones promote plant growth. A plant hormone which inhibits growth is:
(A) abscisic acid (B) Retinol (C) ascorbic acid (D) cytokinin

73. The Energy currency of the cell is
(A) Glycogen (B) protein (C) ATP (D) fatty acid

74. The conversion of a protein waste, ammonia into urea, occurs in
(A) Kidneys (B) Lungs (C) Intestine (D) Liver

75. In humans, the life processes are controlled and regulated by
(A) Reproductive and endocrine systems (B) respiratory and nervous systems
(C) Endocrine and digestive systems (D) nervous and endocrine systems

76. One of the following processes does not lead to the formation of clones. This is:
(A) Fission (B) fertilization (C) fragmentation (D) tissue culture

77. Choose the function of the pancreatic juice from the following
(A) Trypsin digests proteins and lipase digests carbohydrates
(B) trypsin digests emulsified fats and lipase digests proteins
(C) Trypsin and lipase digest fats
(D) trypsin digests proteins and lipase digests emulsified fats

Space for rough work

78. Leydig cells produce
(A) Testosterone (B) Thyroxine (C) Parathhormone (D) None of these

79. A doctor advised a person to take an injection of insulin because
(A) His blood pressure was low (B) his heart was beating slowly
(C) He was suffering from goitre (D) his sugar level in blood was high

80. Which vein brings clean blood from the lungs into the heart?
(A) Renal vein (B) pulmonary vein (C) vena cava (D) hepatic vein

81. Chlorophyll in chloroplasts is located in
(A) Grana (B) Oxysome (C) Cristae (D) Both (A) and (C)

82. The procedure to remove waste products and excess fluid from the blood when the kidneys stop working properly by cleaning the blood of a person by using a machine is known as:
(A) Ketolysis (B) hydrolysis (C) dialysis (D) photolysis

83. Which of the following connects the glycolysis and Krebs' cycle?
(A) Pyruvic acid (B) Glucose (C) Acetyl Co-A (D) ATP

84. The hormone whose deficiency results in Diabetes mellitus is
(A) Oestrogen (B) Vasopressin (C) insulin (D) growth homone

85. The type of dentition is a morphological arrangement in which the base of the tooth is completely enclosed in a deep socket of bone is called ----------
(A) Acrodont (B) Diphyodont (C) Heterodont (D) Thecodont

86. The ability of a cell to divide into several cells during reproduction in plasmodium is called
(A) Budding (B) reduction division (C) fragmentation (D) multiple fission

87. Thymosin is produced by----------gland
(A) Anterior pituitary (B) Posterior pituitary
(C) Thymus (D) Parathyroid

88. Fertilization in mammals occurs in
(A) Uterus (B) Fallopian tube (C) Vagina (D) Cervix

89. The phloem tissue in plants is responsible for the transport of:
(A) Water (B) water and minerals (C) sugar (D) all of the above

90. Which of the following endocrine glands produces emergency hormones?
(A) Adrenal (B) Testes (C) Pituitary (D) Ovary

Space for rough work

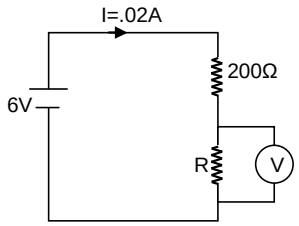
Physics Section - II

Straight Objective Type

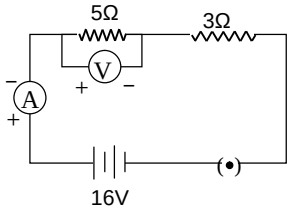
Physics contains 45 multiple choice questions numbered 1 to 45. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. The masses of three wires made of copper are in the ratio 1 : 3 : 5 and their lengths are in ratio 5 : 3 : 1, respectively. The ratio of their electrical resistance is
   (A) 125 : 5 : 3 (B) 25 : 9 : 1/5 (C) 125: 9 : 5 (D) 125 : 15 : 1

2. The reading of ideal voltmeter connected across R in the circuit shown below is:
   (A) 1 V (B) 2 V
   (C) 3 V (D) 4 V



3. In the below electrical circuit, the readings shown by the ammeter and voltmeter are: (both ammeter and voltmeter are ideal)
   (A) 2 A, 10 V (B) 3.2 A, 16 V
   (C) 2 A, 16 V (D) 3.2 A, 10 V



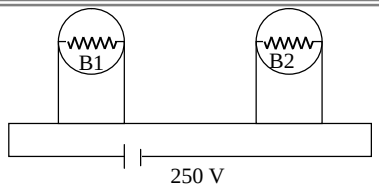
4. If the resistance of a circuit, which has a 12 v source, is increased by 4Ω, the current drops by 0.5 A. What is the original resistance of circuit in Ω ?
   (A) 4 (B) 8 (C) 16 (D) 32

5. 15 cells each of emf 2 volt are connected in series but 2 of them are connected wrongly. Calculate the emf of the combination
   (A) 30-volt (B) 26-volt (C) 22-volt (D) 28 volt

6. The resistivity of a wire
   (A) Increases with the length of the wire
   (B) Decreases with the area of cross-section
   (C) Decreases with the length and increases with the cross-section of wire
   (D) None of the above statement is correct

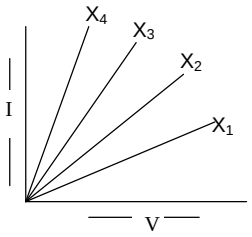
Space for rough work

7. Electric bulb B_1 (100W –250V) and electric bulb B_2 (100 W –200V) are connected across source of 250 V as shown in figure what is the potential drop (approx) across electric bulb B_2?
   (A) 200V (B) 250V
   (C) 98V (D) 48V

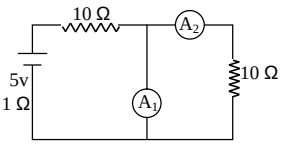


8. If the current through a resistor is increased by 50%, the increase in power dissipated will be (assume the temperature remains constant)
   (A) 225% (B) 200% (C) 250% (D) 125%

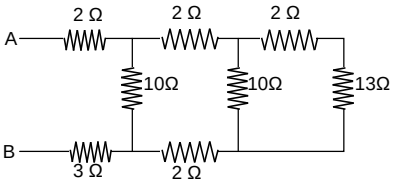
9. Graph shown V-I Characteristics of two resistance their series combination & parallel combination. Identify the resistances values & graphs –
   (A) Resistance 1 = X_1; Resistance 2 = X_2; Series = X_3; Parallel = X_4
   (B) Resistance 1 = X_2; Resistance 2 = X_3; Series = X_1; Parallel = X_1
   (C) Resistance 1 = X_3; Resistance 2 = X_2; Series = X_1; Parallel = X_4
   (D) Resistance 1 = X_4; Resistance 2 = X_1; Series = X_2; Parallel = X_3



10. In the circuit shown all the measuring instrument are ideal. The reading in ammeter A_2 will be
    (A) 1/4A (B) 1A
    (C) <1/4 A (D) Zero



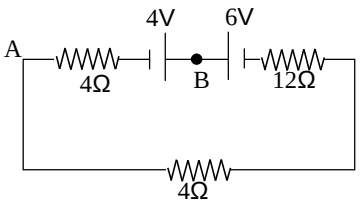
11. In the given circuit, what is the equivalent resistance between A and B?
    (A) 10 Ω (B) 2 Ω
    (C) 5Ω (D) 3Ω



12. The electrical properties of copper and rubber are different because:
    (A) The positive charges are free to move in copper but stationary in rubber.
    (B) Many electrons are free to move in copper, but all electrons are bound to molecules in rubber.
    (C) Positive charges are free to move in rubber but stationary in copper.
    (D) Many electrons are free to move in rubber but stationary in copper.

Space for rough work

13. In the circuit shown, potential difference between A and B is:
(A) + 4 V (B) -4 V
(C) -4.4 V (D) +4.4 V



14. 1kWh equal to:
(A) 3.6×10^4 J (B) 3.6×10^5 J (C) 3.6×10^6 J (D) 3.6×10^7 J

15. An electric Kettle consumes 1 kW of electric power when operated at 220 V. A fuse wire of what rating must be used for it.
(A) 1 A (B) 2 A (C) 5 A (D) 4 A

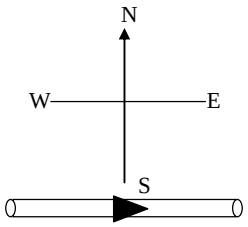
16. When a charged particle in motion enters in a uniform magnetic field perpendicularly then its
(A) Speed changes (B) Velocity changes
(C) K.E. changes (D) Acceleration does not change

17. The radius of the path of a charged particle in a uniform magnetic field is directly proportional to:
(A) Charge of the particle (B) Momentum of the particle
(C) Energy of the particle (D) Intensity of field

18. Dynamo works on the principle of:
(A) Heating effect of current (B) Electromagnetic induction
(C) Chemical effect of current (D) Seebeck effect

19. A beam of alpha particles moving towards east is deflected towards south by magnetic field. The direction of magnetic field is
(A) towards south (B) towards east (C) downward (D) upward

20. A constant current I flows in a horizontal wire in the plane of the paper from West to East as shown in the figure. The direction of magnetic field at a point will be South to North
(A) directly above the wire
(B) directly below the wire
(C) at a point located in the plane of the paper, on the north side of the wire.
(D) at a point located in the plane of the paper, on the south side of the wire.



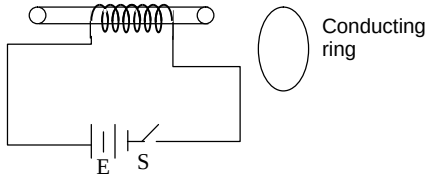
21. Which of the following is true?
I. A moving charge produces magnetic field but no electric field.
II. A moving charge experiences force in magnetic field but not in electric field.
III. Magnetic field inside a solenoid is uniform.
IV. Magnetic field lines are always closed.
(A) I and IV (B) III and IV (C) I and III (D) II and IV

Space for rough work

22. The S.I. unit of magnetic field intensity is:
(A) Weber (B) Tesla (C) Oersted (D) Gauss

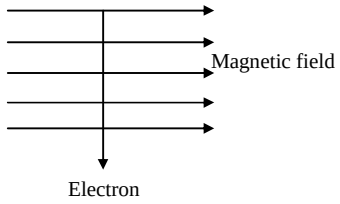
23. Magnetic field due to current through a ..... is similar to magnetic field produced by a bar magnet.
(A) circular loop of conducting wire (B) rectangular loop of conducting wire
(C) solenoid (D) thick copper wire

24. The direction of the current in the conducting ring after the switch is closed for a long time:
(A) Clockwise (B) Anti-Clockwise
(C) No current (D) Can't be predicted

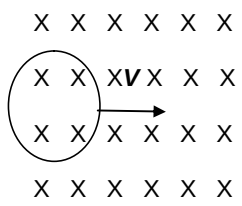


25. **Assertion(A)**: Motion of a charged particle under the action of a magnetic field alone is always with constant speed.
Reason (R): The magnetic force does not have any component either along or opposite to the direction of motion of the charged particles.
(A) Both Assertion and Reason are true, and the reason is the correct explanation of the assertion.
(B) Both Assertion and Reason are true, but the reason is not the correct explanation of the assertion.
(C) Assertion is a true statement, but reason is false.
(D) Both Assertion and Reason are false statements

26. An electron enters in a magnetic field at right angle to it as shown in figure. The direction of force acting on the electron will be:
(A) to the left (B) to the right
(C) out of the page (D) into the page



27. A circular coil is entering a magnetic field as shown. What is the direction of induced current?
(A) Clockwise
(B) Anti-Clockwise
(C) No induced current
(D) Both clockwise and anti-clockwise



28. The maximum attraction in a magnet is:
(A) In the centre (B) On the sides (C) On the poles (D) On the surface

Space for rough work

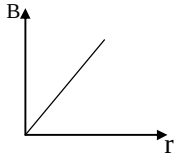
29. If a bar magnet is cut lengthwise into three parts, the total number of Poles will be:
(A) 3 (B) 2 (C) 6 (D) 0

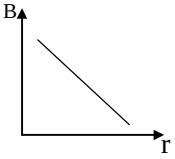
30. The strength of magnetic field inside a long current carrying straight solenoid is:
(A) Minimum in the middle
(B) More at the ends than at the centre
(C) Same at all points
(D) Found to increase from one end to the other.

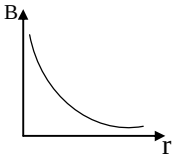
31. In a hydro-Power Plant
(A) Kinetic energy possessed by the stored water is converted into potential energy.
(B) Potential energy possessed by the stored water is converted into electricity.
(C) Water is converted into steam to produce electricity.
(D) Heat is extracted from water to produce electricity.

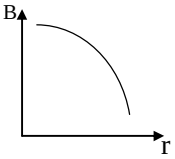
32. Ocean thermal energy is due to:
(A) Energy stored by waves in the ocean
(B) Pressure difference at different levels in the ocean.
(C) Tides arising out in the ocean.
(D) Temperature difference at different levels in the oceans.

33. Which of the following graphs shown the variation of magnetic induction B with distance r from a long wire carrying current

(A) 

(C) 

(C) 

(D) 

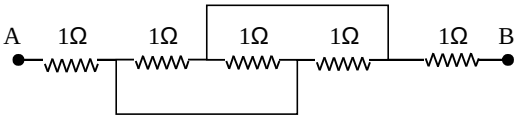
34. Dimensions of a block are $1\,cm \times 1\,cm \times 100\,cm$. If specific resistance of its material is 3×10^{-7} ohm – m , then the resistance between the opposite rectangular faces is
(A) 3×10^{-9} ohm (B) 3×10^{-7} ohm (C) 3×10^{-5} ohm (D) 3×10^{-3} ohm

35. When a magnetic field is applied in a direction perpendicular to the direction of cathode rays, then their
(A) Energy decreases
(B) Energy increases
(C) Momentum increases
(D) Magnitude of momentum and energy remain unchanged

36. Which is the important constituent (95%) of natural gas?
(A) Methane (B) Propane (C) Ethane (D) Chlorine

Space for rough work

37. Equivalent resistance between the points A and B is (in Ω)



(A) $\frac{1}{5}$ (B) $1\frac{1}{4}$

(C) $2\frac{1}{3}$ (D) $3\frac{1}{2}$

38. Which of the following is electromagnetic in nature?
(A) α- ray (B) β- ray (C) γ- ray (D) Cathode ray

39. Which of the following isotopes of uranium is unstable?
(A) U-234 (B) U-235 (C) U-238 (D) All of these

40. The renewable source of energy is:
(A) Coal (B) Uranium (C) Natural gas (D)Geothermal power

41. A helium nucleus makes a full rotation in a circle of radius 0.8 metre in two seconds. The value of the magnetic field B at the centre of the circle will be

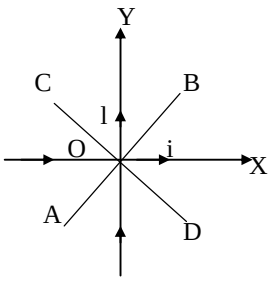
(A) $\frac{10^{-19}}{\mu_o}$ (B) $10^{-19}\mu_o$ (C) $2\times10^{-10}\mu_o$ (D) $\frac{2\times10^{-10}}{\mu_o}$

42. During nuclear fission
(A) Heat is transformed into energy (B) Radiation is transformed into energy
(C) Weight is transformed into energy (D) Mass is transformed into energy

43. Atomic clock is based on the principle of periodic vibration in the
(A) Polonium atom (B) Uranium atom (C) Carbon atom (D) Caesium atom

44. A star produces its energy through the process of
(A) Nuclear fusion (B) Chemical reaction
(C) Nuclear fission (D) Gravitational attraction between different parts of the star

45. Two very thin metallic wires placed along X and Y-axis carry equal currents as shown here. AB and CD are lines of 45° with the axis with origin of axes at O. The magnetic field will be zero on the line
(A) AB
(B) CD
(C) Segment of OB only of line AB
(D) Segment OC only of line CD



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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.

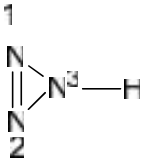
1. Which of the following is not a redox reaction?
   (A) $SO_3 + H_2O \rightarrow H_2SO_4$
   (B) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2(g)$
   (C) $Cl_2 + H_2O \rightarrow HCl + HOCl$
   (D) $H_2O_2 \rightarrow H_2 + O_2$

2. Burning of methane in oxygen is an example for
   (A) Endothermic reaction
   (B) exothermic reaction
   (C) Photo chemical reaction
   (D) neutralization

3. In electro-refining of metal the impure metal is made the anode and a strip of pure metal the cathode during the electrolysis of an aqueous solution of a complex metal salt. This method cannot be used for refining of
   (A) Silver (B) Copper (C) Aluminium (D) Gold

4. $4KClO_3 \rightarrow 3KClO_4 + KCl$. This is an example of _____ reaction.
   (A) decomposition (B) disproportionation (C) displacement (D) both a &b

5. Aqueous solution of $FeCl_3$
   (A) Turns blue litmus solution red
   (B) turns red litmus solution blue
   (C) decolourises litmus solution
   (D) does not affect litmus solution

6. 

, In this compound oxidation state of N^1, N^2 and N^3 are:
   (A) 0, 0, 3 (B) 0, 0, -1 (C) 1, 1, -3 (D) -3, -3, -3

7. Concentration of $\left[H^+\right]$ will decrease on mixing which of the following salts with the solution of acetic acid
   (A) KCN (B) NaCl (C) NH_4Cl (D) $Al_2(SO_4)_3$

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8. During the process of electrolytic refining of copper some metals present as impurity settle as 'anode mud'. There are:
(A) Fe and Ni (B) Ag and Au (C) Pb and Zn (D) Sn and Ag

9. What will be the value of K_W at 90°C, if $\left[H^+\right]$ in pure water is 10^{-6} gram ion/litre?
(A) 10^{-10} (B) 10^{-16} (C) 1×10^{-12} (D) 2×10^{-6}

10. Solution of which of the following will have maximum pH value?
(A) NaCl (B) Na_2CO_3 (C) NH_4Cl (D) $NaHCO_3$

11. The pH of a solution is 5.0. An acid is added to it so that its pH becomes 2.0. The $[H^+]$ concentration of the solution increases:
(A) 100 times (B) 1000 times (C) 2.5 times (D) 10 times

12. The ignition powder used in Gold Schmidt's method is:
(A) $Na_2O_2 + Al$ (B) $Ba_2O_2 + Mg$ (C) $Na_2O_2 + Mg$ (D) $Al + BeO$

13. Red hot iron react with steam to give _____ and hydrogen
(A) FeO only (B) Fe_2O_3 only (C) Fe_3O_4 (D) None

14. $H_2S + H_2O_2 \rightarrow 2H_2O + S$; The given reaction shows:
(A) Acidic nature of H_2O_2 (B) Alkaline nature of H_2O_2
(C) Oxidising action of H_2O_2 (D) Reducing action of H_2O_2

15. The weakest Bronsted base is:
(A) Br^- (B) NO_3^- (C) SO_4^{2-} (D) ClO_4^-

16. BF_3 is a:
(A) Lewis acid (B) Lewis base (C) Arrhenious acid (D) None of these

17. Under the same conditions, which mixture by volume of one molar potassium hydroxide and one molar nitric acid solution produces the highest temperature
(A) 20 – 80 (B) 25 – 75 (C) 50 – 50 (D) 75 - 25

18. Roasting process is not applied to which of the following ores?
(A) Galena (B) Iron pyrites (C) Copper glance (D) Bauxite

Space for rough work

19. Conjugate base of HPO_4^{2-} is

(A) PO_4^{3-} (B) $H_2PO_4^-$ (C) H_3PO_4 (D) H_4PO_3

20. In which of the following reactions H_2O_2 is a reducing agent

(A) $2FeCl_2 + 2HCl + H_2O_2 \rightarrow 2FeCl_3 + 2H_2O$ (B) $Cl_2 + H_2O_2 \rightarrow 2HCl + O_2$

(C) $2HI + H_2O_2 \rightarrow 2H_2O + I_2$ (D) $H_2SO_3 + H_2O_2 \rightarrow H_2SO_4 + H_2O$

21. The value of n in, $MnO_4^- + 8H^+ + ne^- \rightarrow Mn^{2+} + 4H_2O$ is;

(A) 5 (B) 3 (C) 4 (D) 2

22. Which of the following trend is correct with respect to oxidation state of Iodine?

(A) $I_2 < HI < HIO_4 < ICl$ (B) $HI < I_2 < ICl < HIO_4$ (C) $I_2 < HIO_4 < HI < ICl$ (D) $HI < ICl < I_2 < HIO_4$

23. Which of the following regarding H_2SO_5 and $H_2S_2O_8$ is correct?

(A) The oxidation number, of S in both the compounds is +6

(B) H_2SO_5doesnot have peroxy linkage

(C) Both the acids does not have peroxy linkage

(D) Both the acids donot have peroxy linkage and oxidation number of S in $H_2S_2O_8$ is +7.

24. H_3BO_3 is ….acid

(A) Monobasic (B) Dibasic (C) Tribasic (D) None

25. What is the p^H of a solution containing 0.0005 M $Ba(OH)_2$?

(A) 3 (B) 11 (C) 5 (D) 9

26. The anhydride of H_3PO_4 is

(A) P_2O_5 (B) P_2O_3 (C) PO_2 (D) None

27. Cryolite is an ore of

(A) Iron (B) Silver (C) Zinc (D) Aluminium

28. For the reaction

$MnO_4^- + C_2O_4^{2-} + H^+ \rightarrow Mn^{2+} + CO_2 + H_2O$

the correct coefficients of the reactants for the balanced reaction are

	MnO_4^-	$C_2O_4^{2-}$	H^+
(A)	2	5	16
(B)	16	5	2
(C)	5	16	2
(D)	2	16	5

Space for rough work

29. The reaction of an elements A with water produces combustible gas B and an aqueous solution of C. When another substance D reacts with this solution C also produces the same gas B. D also produces the same gas even on reaction with dilute H_2SO_4 at room temperature. Elements A imparts golden yellow colour to Bunsen flame. Then, A, B, C and D may be identified as
(A) $Na, H_2, NaOH$ and Zn
(B) K, H_2, KOH and Zn
(C) $K, H_2, NaOH$ and Zn
(D) $Ca, H_2, CaCOH_2$ and Zn

30. The 'milk of magnesia' used as an antacid is chemically
(A) $Mg(OH)_2$ (B) MgO (C) $MgCl_2$ (D) $MgO + MgCl_2$

31. Fire extinguishers contain
(A) conc. H_2SO_4 solution
(B) H_2SO_4 and $NaHCO_3$ solutions
(C) $NaHCO_3$ solution
(D) $CaCO_3$ solution

32. aq. $NaOH + P_4\,(\text{white}) \rightarrow PH_3 + X$; compound X is
(A) NaH_2PO_2 (B) $NaHPO_4$ (C) Na_2CO_3 (D) $NaHCO_3$

33. Weakest base among KOH, NaOH, $Ca(OH)_2$ and $Zn(OH)_2$ is
(A) $Ca(OH)_2$ (B) KOH (C) NaOH (D) $Zn(OH)_2$

34. Sodium metal is highly reactive and cannot be stored under
(A)toluene (B) kerosene oil (C) alcohol (D) benzene

35. $Y \xleftarrow{\Delta,205^\circ C} CaSO_4.2H_2O \xrightarrow{\Delta,120^\circ C} X$. X and Y are respectively
(A) plaster of paris, dead burnt plaster
(B) dead burnt plaster, plaster of pairs
(C) CaO and plaster of pairs
(D) Plaster of pairs, mixture of gases

36. In the extraction of copper from its sulphide ore the metal is formed by the reduction of Cu_2O with:
(A) FeS (B) CO (C) Cu_2S (D) SO_2

37. Mercury is purified by:
(A) Passing through dilute HNO_3 (B) Distillation (C) distribution (D) Vapour phase refining

Space for rough work

38. In the alumino thermite process, Al acts as
(A) An oxidising agent (B) A flux (C) A reducing agent (D) A solder

39. Carnallite does not contain
(A) K (B) Ca (C) Mg (D) Cl

40. Which one of the following is not a method of concentration of ore?
(A) gravity separation (B) froth floating process
(C) electromagnetic separation (D) smelting

41. Nitrogen show different oxidation states in the range
(A) 0 to + 5 (B) – 3 to + 5 (C) – 5 to + 3 (D) – 3 to + 3

42. In a balanced equation
$H_2SO_4 + x\ \ HI \rightarrow H_2S + y\ \ I_2 + z\ \ H_2O$, the values of *x, y, z* are
(A) x= 3, y = 5, z = 2 (B) x = 4, y = 8, z = 5 (C) x = 8, y = 4, z = 4 (D) x = 5, y = 3, z = 4

43. The lightest metal is
(A) Li (B) Mg (C) Ca (D) Na

44. The reaction of $KMnO_4$ and HCl results in
(A) Oxidation of Mn in $KMnO_4$ and production of Cl_2
(B) Reduction of Mn in $KMnO_4$ and production of H_2
(C)Oxidation of Mn in $KMnO_4$ and production of H_2
(D) Reduction of Mn in $KMnO_4$ and production of Cl_2

45. Which of the following is not a reducing agent
(A) $NaNO_2$ (B) $NaNO_3$ (C) HI (D) $SnCl_2$

Space for rough work