SCHOOL EDUCATION DEPARTMENT

VELLORE DISTRICT

X STANDARD

SCIENCE

QUESTION BANK

2022 – 2023

முதன்மைக் கல்வி அலுவலரின் வாழ்த்துச் செய்தி

அன்புடையீர் வணக்கம்,

அனைவருக்கும் நல்வாழ்த்துக்கள் மார்ச்2023– பத்தாம் வகுப்பு பொதுத்தேர்வில் சாதனை புரிய இருக்கும் அனைத்து அரசு/ அரசு நிதியுதவி / தனியார் , உயர்நிலை / மேல்நிலைப் பள்ளிகளில் பயிலும் மாணவ – மாணவியர்களுக்கும் என் இதயம் கனிந்த நல்வாழ்த்துக்கள்.

“வாய்ப்புக்காக காத்திராதே வாய்ப்பை ஏற்படுத்திக்கொள்” – அப்துல் கலாம்

இக்கையேடு மாணவச் செல்வங்கள் தேர்வில் சாதனை புரிய வேண்டும் என்ற நோக்கில் உருவாக்கப்பட்டுள்ளது. இக்கையேட்டில் இயற்பியல், வேதியியல் மற்றும் உயிரியல் பாடங்களில் உள்ள முக்கிய வினாக்களின் தொகுப்பு தனித்தனியாக மதிப்பெண் வாரியாகப் பிரித்துத் தரப்பட்டுள்ளது. தேர்ச்சி மட்டுமே நோக்கமாக இல்லாமல் அனைத்து மாணவர்களும் குறைந்த பட்சமாக **(40/75)** மதிப்பெண் வாங்கும் அளவிற்கு மாணவ / மாணவியரின் நலன் கருதி தயாரிக்கப்பட்டுள்ளது. எனவே, மாணவச்செல்வங்கள் இக்கையேட்டினை முழுமையாகப் புரிந்துகொண்டு, படித்து நிறைவான மதிப்பெண் பெற்று வேலூர் மாவட்டத்தின் தேர்ச்சி விழுக்காட்டினை உயர்த்தி நம் மாவட்டத்திற்குப் பெருமை சேர்ப்போம்.

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PHYSICS

I. CHOOSE THE CORRECT ANSWER :

1. Inertia of a body depends on

   a) weight of the object b) acceleration due to gravity of the planet

   c) mass of the object d) Both a & b

2. Impulse is equals to

   a) rate of change of momentum b) rate of force and time

   c) change of momentum d) rate of change of mass

3. Newton's III law is applicable

   a) for a body is at rest b) for a body in motion

   c) both a & b d) only for bodies with equal masses

4. Plotting a graph for momentum on the X-axis and time on Y-axis. slope of momentum-time graph gives

   a) Impulsive force b) Acceleration **c) Force** d) Rate of force

5. In which of the following sport the turning of effect of force used

   a) swimming b) tennis c) cycling d) hockey

6. The unit of 'g' is ms^{-2}. It can be also expressed as

   a) $cm\ s^{-1}$ **b) $N\ kg^{-1}$** c) $N\ m^2\ kg^{-1}$ d) $cm^2\ s^{-2}$

7. One kilogram force equals to

   a) 9.8 dyne b) 9.8×10^4 N **c) 98×10^4 dyne** d) 980 dyne

8. The mass of a body is measured on planet Earth as M kg. When it is taken to a planet of radius half that of the Earth then its value will be____kg

   a) 4 M b) 2M c) M/4 **d) M**

9. If the Earth shrinks to 50% of its real radius its mass remaining the same, the weight of a body on the Earth will

   a) decrease by 50% b) increase by 50% c) decrease by 25% **d) increase by 300%**

10. To project the rockets which of the following principle(s) is /(are) required?

    a) Newton's third law of motion b) Newton's law of gravitation

    c) law of conservation of linear momentum **d) both a and c**

11. The refractive index of four substances A, B, C and D are 1.31, 1.43, 1.33, 2.4 respectively. The speed of light is maximum in

    a) A b) B c) C d) D

12. Where should an object be placed so that a real and inverted image of same size is obtained by a convex lens

a) f **b) 2f** c) infinity d) between f and 2f

13. A small bulb is placed at the principal focus of a convex lens. When the bulb is switched on, the lens will produce

a) a convergent beam of light b) a divergent beam of light

c) a parallel beam of light d) a coloured beam of light

14. Magnification of a convex lens is

a) Positive b) negative **c) either positive or negative** d) zero

15. A convex lens forms a real, diminished point sized image at focus. Then the position of the object is at

a) focus **b) infinity** c) at 2f d) between f and 2f

16. Power of a lens is –4D, then its focal length is

a) 4m b) –40m **c) –0.25 m** d) –2.5 m

17. In a myopic eye, the image of the object is formed

a) behind the retina b) on the retina c) in front of the retina d) on the blind spot

18. The eye defect 'presbyopia' can be corrected by

a) convex lens b) concave lens c) convex mirror **d) Bi focal lenses**

19. Which of the following lens would you prefer to use while reading small letters found in a dictionary?

a) A convex lens of focal length 5 cm b) A concave lens of focal length 5 cm

c) A convex lens of focal length 10 cm d) A concave lens of focal length 10 cm

20. If V_B, V_G, V_R be the velocity of blue, green and red light respectively in a glass prism, then which of the following statement gives the correct relation?

a) $V_B = V_G = V_R$ b) $V_B > V_G > V_R$ **c) $V_B < V_G < V_R$** d) $V_B < V_G > V_R$

21. The value of universal gas constant

a) 3.81 $mol^{-1} K^{-1}$ b) 8.03 $mol^{-1} K^{-1}$ c) 1.38 $mol^{-1} K^{-1}$ **d) 8.31 $mol^{-1} K^{-1}$**

22. If a substance is heated or cooled, the change in mass of that substance is

a) positive b) negative **c) zero** d) none of the above

23. If a substance is heated or cooled, the linear expansion occurs along the axis of

a) X or –X b) Y or –Y **c) both (a) and (b)** d) (a) or (b)

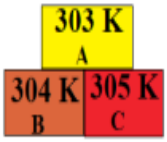
24. Temperature is the average _____ of the molecules of a substance

a) difference in K.E and P.E b) sum of P.E and K.E

c) difference in T.E and P.E d) difference in K.E and T.E

25. In the Given diagram, the possible direction of heat energy transformation is

a.	**A ← B**	**A ← C**	**B ← C**
b.	A → B	A → C	B → C
c.	A → B	A → C	B → C
d.	A ← B	A → C	B ← C



26. Which of the following is correct?

a) Rate of change of charge is electrical power. **b) Rate of change of charge is current**.

c) Rate of change of energy is current. d) Rate of change of current is charge.

27. SI unit of resistance is

a) mho b) joule **c) ohm** d) ohm meter

28. In a simple circuit, why does the bulb glow when you close the switch?

a) The switch produces electricity **b) Closing the switch completes the circuit**.

c) Closing the switch breaks the circuit. d) The bulb is getting charged.

29. Kilowatt hour is the unit of

a) resistivity b) conductivity **c) electrical energy** d) electrical power

30. When a sound wave travels through air, the air particles

a) vibrate along the direction of the wave motion b) vibrate but not in any fixed direction

c) vibrate perpendicular to the direction of the wave motion d) do not vibrate

31. Velocity of sound in a gaseous medium is 330 m s^{-1}. If the pressure is increased by 4 times without causing a change in the temperature, the velocity of sound in the gas is

a) 330 m s^{-1} b) 660 m s^{-1} c) 156 m s^{-1} d) 990 m s^{-1}

32. The frequency, which is audible to the human ear is

a) 50 kHz **b) 20 kHz** c) 15000 kHz d) 10000 kHz

33. The velocity of sound in air at a particular temperature is 330 m s^{-1}. What will be its value when temperature is doubled and the pressure is halved?

a) 330 m s^{-1} b) 165 m s^{-1} **c) 330 × √2 m s^{-1}** d) 320 / √ 2 m s^{-1}

34. If a sound wave travels with a frequency of 1.25×10^4 Hz at 344 m s^{-1}, the wavelength will be a) 27.52 m b) 275.2 m **c) 0.02752** m d) 2.752 m

35. The sound waves are reflected from an obstacle into the same medium from which they were incident. Which of the following changes?

a) speed b) frequency c) wavelength **d) none of these**

36. Velocity of sound in the atmosphere of a planet is 500 m s^{-1}. The minimum distance between the sources of sound and the obstacle to hear the echo, should be

a) 17 m b) 20 m **c) 25 m** d) 50 m

37. Man-made radioactivity is also known as _____

a. Induced radioactivity b. Spontaneous radioactivity **c. Artificial radioactivity** d. a & c

38. Unit of radioactivity is _____

a. roentgen b. Curie c. becquerel **d. all the above**

39. Artificial radioactivity was discovered by

a. Bequerel **b. Irene Curie** c. Roentgen d. Neils Bohr

40. In which of the following, no change in mass number of the daughter nuclei takes place

i) α decay ii) β decay iii) γ decay iv) neutron decay

a. (i) is correct **b. (ii) and (iii) are correct** c. (i)&(iv) are correct d.(ii)&(iv) are correct

41. _____ isotope is used for the treatment of cancer.

a. Radio Iodine **b. Radio Cobalt** c. Radio Carbon d. Radio Nickel

42. Gamma radiations are dangerous because

a. it affects eyes & bones b. it affects tissues

c. it produces genetic disorder d. it produces enormous amount of heat

43. 43. _____ aprons are used to protect us from gamma radiations

a. Lead oxide b. Iron **c. Lead** d. Aluminium

44. Which of the following statements is/are correct?

i. α particles are photons ii. Penetrating power of γ radiation is very low

iii. Ionization power is maximum for α rays iv. Penetrating power of γ radiation is very high

a. (i) & (ii) are correct b. (ii) & (iii) are correct c. (iv) only correct **d. (iii) & (iv) are correct**

45. Proton - Proton chai reaction is an example of _____

a. Nuclear fission b. α – decay **c. Nuclear fusion** d. β – decay

46. In the nuclear reaction ${}_{6}X_{12}$ α decay ${}_{Z}Y_{A}$, the value of A & Z.

a. 8, 6 **b. 8, 4** c. 4, 8 d. cannot be determined with the given data

47. Kamini reactor is located at _____

a. Kalpakkam b. Koodankulam c. Mumbai d. Rajasthan

48. Which of the following is/are correct?

i. Chain reaction takes place in a nuclear reactor and an atomic bomb.

ii. The chain reaction in a nuclear reactor is controlled

iii. The chain reaction in a nuclear reactor is not controlle

iv. No chain reaction takes place in an atom bomb

a. (i) only correct **b. (i) & (ii) are correct** c. (iv) only correct d. (iii) & (iv) are correct

II. FILL UP THE BLANKS:

1. To produce a displacement _____ is required
2. Passengers lean forward when sudden brake is applied in a moving vehicle. This can be explained by _____
3. By convention, the clockwise moments are taken as _____ and the anticlockwise moments are taken as_____
4. _____ is used to change the speed of car.
5. A man of mass 100 kg has a weight of _____ at the surface of the Earth
6. The path of the light is called as_____
7. The refractive index of a transparent medium is always greater than _____
8. If the energy of incident beam and the scattered beam are same, then the scattering of light is called as _____scattering.
9. According to Rayleigh's scattering law, the amount of scattering of light is inversely proportional to the fourth power of its_____
10. Amount of light entering into the eye is controlled by_____
11. The value of Avogadro number _____
12. The temperature and heat are _____ quantities
13. One calorie is the amount of heat energy/required to raise the temperature of _____ of water through_____.
14. According to Boyle's law, the shape of the graph between pressure and reciprocal of volume is ___
15. When a circuit is open, _____ cannot pass through it.
16. The ratio of the potential difference to the current is known as _____.
17. The wiring in a house consists of _____ circuits.
18. The power of an electric device is a product of _____ and _____.
19. LED stands for _____.
20. Rapid back and forth motion of a particle about its mean position is called _____
21. If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating in _____
22. A whistle giving out a sound of frequency 450 Hz, approaches a stationary observer at a speed of 33 m s^{-1}. The frequency heard by the observer is (speed of sound = 330 m s^{-1}) _____.

23. A source of sound is travelling with a velocity 40 km/h towards an observer and emits a sound of frequency 2000 Hz. If the velocity of sound is 1220 km/h, then the apparent frequency heard by the observer is _____.
24. One roentgen is equal to _____ disintegrations per second
25. Positron is an_____.
26. Anemia can be cured by _____ isotope
27. Abbreviation of ICRP_____
28. _____is used to measure exposure rate of radiation in humans.
29. _____ has the greatest penetration power.
30. ${}_{Z}Y_{A} \rightarrow {}_{Z+1}Y_{A} + X$; Then, X is _____
31. ${}_{Z}X_{A} \rightarrow {}_{Z}Y_{A}$ This reaction is possible in _____ decay.
32. The average energy released in each fusion reaction is about _____ J.
33. Nuclear fusion is possible only at an extremely high temperature of the order of ____ K.
34. The radio isotope of _____ helps to increase the productivity of crops.
35. If the radiation exposure is 100 R, it may cause _____.

ANSWERS

1. Unbalanced Force	13. 1 gram, $1°C$	25. Anti Particle of electron
2. Inertia of Motion	14. Straight Line	26.Iron – 59
3. –ve	15. Current	27. International commission of Radiological Protection
4. Torque	16. Resistance	28. Dosimeter
5. 980 N	17. Parallel	29. γ rays
6. Ray	18. Potential Difference, Resistance	30. Electron
7. One	19. Light Emitting Diode	31. γ
8. Elastic	20. Vibration	32. 3.84×10^{-12}
9. Wavelength	21. Both North and South	33. 10^{7} to 10^{9}
10. Iris	22. 13.67 m	34. P -32
11. 6.023×10^{23}	23. 2068 Hx	35. Leukamia
12. Scalar	24. 3.7×10^{10}	

III. STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE. CORRECT THE STATEMENT IF IT IS FALSE:

1. The linear momentum of a system of particles is always conserved. **False**

2. Apparent weight of a person is always equal to his actual weight. **False (not always equal)**
3. Weight of a body is greater at the equator and less at the polar region. **False**
   Ans : Weight of a body is less at the equator and greater at the polar region.
4. Turning a nut with a spanner having a short handle is so easy than one with a long handle. **False (Difficule than one with a long handle)**
5. There is no gravity in the orbiting space station around the Earth. So the astronauts feel weightlessness. **False(Equal Gravity)**
6. Velocity of light is greater in denser medium than in rarer medium. **False**
   Ans Velocity of light is greater in rarer medium than in denser medium.
7. The power of lens depends on the focal length of the lens. **True**
8. Increase in the converging power of eye lens cause 'hypermetropia'. **False (Hypermyopia)**
9. The convex lens always gives small virtual image. **False (Concave)**
10. For a given heat in liquid, the apparent expansion is more than that of real expansion. **False (Less than that of real expansion)**
11. Thermal energy always flows from a system at higher temperature to a system at lower temperature. **True**
12. According to Charles's law, at constant pressure, temperature is inversely proportional to volume. **False (Directly Proportional)**
13. Ohm's law states the relationship between power and voltage. **False (between Current and resistance)**
14. MCB is used to protect house hold electrical appliances. **True**
15. The SI unit for electric current is the coulomb. **False(Ampere)**
16. One unit of electrical energy consumed is equal to 1000 kilowatt hour. **False**
17. The effective resistance of three resistors connected in series is lesser than the lowest of the individual resistances. **False (Greater than the lowest)**
18. Sound can travel through solids, gases, liquids and even vacuum. **False**
    Ans : Sound can travel through solids, gases, liquids
19. Waves created by Earth Quake are Infrasonic. **True**
20. The velocity of sound is independent of temperature. **False(Dependent)**
21. The Velocity of sound is high in gases than liquids. **False(Low in Gases than Liquids)**
22. Plutonium -239 is a fissionable material. **True**

23. Elements having atomic number greater than 83 can undergo nuclear fusion. **False (Natural Radioactivity)**

24. Nuclear fusion is more dangerous than nuclear fission. **True**

25. Natural uranium U-238 is the core fuel used in a nuclear reactor. **False (U-235)**

26. If a moderator is not present, then a nuclear reactor will behave as an atom bomb. **False(Control rod)**

27. During one nuclear fission on an average, 2 to 3 neutrons are produced. **True**

28. Einstein's theory of mass energy equivalence is used in nuclear fission and fusion. **True**

MATCH THE FOLLOWING:

1.

Column I		Column II	
a. Newton's I law	-	propulsion of a rocket	4
b. Newton's II law	-	Stable equilibrium of a body	1
c. Newton's III law	-	Law of force	2
d. Law of conservation of Linear momentum	-	Flying nature of bird	3

2.

Column - I		Column - II	
1 Retina	a	Path way of light	2
2 Pupil	b	Far point comes closer	4
3 Ciliary muscles	c	near point moves away	5
4 Myopia	d	Screen of the eye	1
5 Hypermetropia	f	Power of accom-modation	3

3.

Column-I		Column-II	
1. Linear expansion	-	(a) change in volume	3
2. Superficial expansion	-	(b) hot body to cold body	4
3. Cubical expansion	-	(c) 1.381 X 10^{-23} JK^{-1}	5
4. Heat transformation	-	(d) change in length	1
5. Boltzmann constant	-	(e) change in area	2

4.

Column - I	Column - II	
(i) electric current	(a) volt	2
(ii) potential difference	(b) ohm meter	3
(iii) specific resistance	(c) watt	4
(iv) electrical power	(d) joule	5
(v) electrical energy	(e) ampere	1

5.

1. Infrasonic	-	(a) Compressions	4
2. Echo	-	(b) 22 kHz	3
3. Ultrasonic	-	(c) 10 Hz	1
4. High pressure region	-	(d) Ultrasonography	2

6.

Match: I

a. BARC	Kalpakkam	3
b. India's first atomic power station	Apsara	4
c. IGCAR	Mumbai	1
d. First nuclear reactor in India	Tarapur	2

7.

Match: II		
a. Fuel	lead	4
b. Moderator	heavy water	3
c. Coolant	cadmium rods	2
d. Shield	uranium	1

8.

a. Soddy Fajan	Natural radioactivity	3
b. Irene Curie	Displacement law	1
c. Henry Bequerel	Mass energy equivalence	4
d. Albert Einstein	Artificial Radioactivity	2

9.

a. Uncontrolled fission reaction	Hydrogen Bomb	4
b. Fertile material	Nuclear Reactor	3
c. Controlled fission reaction	Breeder reactor	2
d. Fusion reaction	Atom bomb	1

10.

a. Co - 60	Age of fossil	4
b. I - 131	Function of Heart	3
c. Na -11	Leukemia	1
d. C - 14	Thyroid disease	2

ASSERTION AND REASONING:

I) A and R are true, R explains A

II) A and R are true, R not explains A

III) A true, R is false

IV) A false , R true

V) Both A and r are wrong

1. **Assertion:** The sum of the clockwise moments is equal to the sum of the anticlockwise moments.

   Reason: The principle of conservation of momentum is valid if the external force on the system is zero. **I**

2. **Assertion:** The value of 'g' decreases as height and depth increases from the surface of the Earth.

   Reason: 'g' depends on the mass of the object and the Earth.

3. **Assertion:** If the refractive index of the medium is high (denser medium) the velocity of the light in that medium will be small

   Reason: Refractive index of the medium is inversely proportional to the velocity of the light

4. **Assertion:** Myopia is due to the increase in the converging power of eye lens. **Reason:** Myopia can be corrected with the help of concave lens. **I**
5. **Assertion:** There is no effects on other end when one end of the rod is only heated. **Reason:** Heat always flows from a region of lower temperature to higher temperature of the rod. **V**
6. **Assertion:** Gas is highly compressible than solid and liquid **Reason:** Interatomic or intermolecular distance in the gas is comparably high **I**
7. **Assertion:** Electric appliances with a metallic body have three wire connections. **Reason:** Three pin connections reduce heating of the connecting wires. **III**
8. **Assertion:** In a simple battery circuit the point of highest potential is the positive terminal of the battery.
   Reason: The current flows towards the point of the highest potential **III**
9. **Assertion:** LED bulbs are far better than incandescent bulbs. **Reason:** LED bulbs consume less power than incandescent bulbs. **I**
10. **Assertion**: The change in air pressure affects the speed of sound. **Reason**: The speed of sound in a gas is proportional to the square of the pressure**.V**
11. **Assertion**: Sound travels faster in solids than in gases. **Reason**: Solid posses a greater density than that of gases. **II**
12. **Assertion:** A neutron impinging on U_{235}, splits it to produce Barium and Krypton. **Reason**: U - 235 is a fissile material. **II**
13. **Assertion**: In a β - decay, the neutron number decreases by one. **Reason**: In β - decay atomic number increases by one. **I**
14. **Assertion**: Extreme temperature is necessary to execute nuclear fusion. **Reason**: In a nuclear fusion, the nuclei of the reactants combine releasing high energy. **I**
15. **Assertion**: Control rods are known as 'neutron seeking rods' **Reason**: Control rods are used to perform sustained nuclear fission reaction. **I**

ARRANGE THE FOLLOWING IN THE CORRECT SEQUENCE:

1. Arrange in descending order, on the basis of their penetration power

3 2 1 4

Alpha rays, beta rays, gamma rays, cosmic rays

2. Arrange the following in the chronological order of discovery

4 1 3 2

Nuclear reactor, radioactivity, artificial radioactivity, discovery of radium

USE THE ANALOGY TO FILL IN THE BLANK

1. Spontaneous process : Natural Radioactivity,
   Induced process : _____ Artificial Radioactivity
2. Nuclear Fusion : Extreme temperature,
   Nuclear Fission : _____ Normal Temperature
3. Increasing crops : Radio phosphorous,
   Effective functioning of heart : _____ Na24
4. Deflected by electric field : α ray,
. Null Deflection : _____ γRays

TWO MARK QUESTIONS :

1. Define inertia. Give its classification
   The inability of the body to change its state of rest or of uniform motion in a straight line unless it act upon by an unbalanced force
   Types: 1. Inertia of rest 2. Inertia of motion 3. Inertia of direction
2. Classify the types of forces based on their application
   i) Like parallel forces
   ii) Unlike parallel forces
3. If a 5 N and a 15 N forces are acting opposite to one another. Find the resultant force and the direction of action of the resultant force

   $F_1 = 5N \quad F_2 = 15$ N

   Resultant force = $F_2 - F_1$

   $= 15 - 5$

   $= 10$ N

   Direction : the resultant force act along the direction of force 15 N
4. Differentiate mass and weight.

Mass	Weight
It is the quantity of matter present in the body	It is the gravitational force exerted on the body
Unit : kilogram	Unit: newton
Scalar quantity	Vector quantity

5. Define moment of a couple

Moment of the couple is measured by the product of any one of the forces and the perpendicular distance between two forces.

$$M = F \times S \quad \text{unit : Nm}$$

6. **State the Principle of Moments.**

   When a number of like or unlike parallel forces act on a rigid body and the body is in equilibrium, then the algebraic sum of the moments in the clockwise direction is equal to the algebraic sum of the moments in the anticlockwise direction **(or)**

   At equilibrium, the algebraic sum of the moments of all the individual forces about any point is equal to zero.

$$F_1 \times d_1 = F_2 \times d_2$$

7. State Newton's second law.

   The force acting on a body is directly proportional to the rate of change of linear momentum of the body and the change in momentum takes place in the direction of the force

8. While catching a cricket ball the fielder lowers his hands backwards. Why?

   Since F = change in momentum / time

   In cricket, a fielder pulls back his hands while catching the ball to experiences a smaller force for a longer interval of time , resulting in a lesser impulse on his hands.

9. How does an astronaut float in a space shuttle?

   Since space station and astronauts have equal acceleration, they are under free fall condition

10. Define impulse .

    When a force F acts on a body for a period of time t, then the product of force and time is known as '**impulse**' Impulse, $J = F \times t$ **(or)**

    Impulse is equal to the magnitude of change in momentum $J = \Delta p$

    Unit : kg m s^{-1} or N s

11. State newtons first law.

    Every body continues to be in its state of rest or the state of uniform motion along a straight line unless it is acted upon by some external force.

12. State newtons second law

    The force acting on a body is directly proportional to the rate of change of linear momentum of the body and the change in momentum takes place in the direction of the force.

13. State newtons third law.

For every action, there is an equal and opposite reaction They always act on two different bodies

14. What is refractive index?

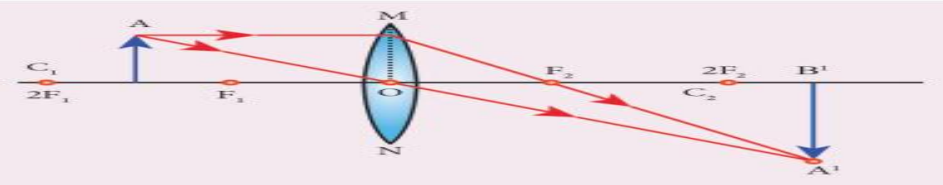
The ratio of speed of light in vacuum to the speed of light in a medium is defined as refractive index 'μ' of that medium

15. State snell's law.

The ratio of the sine of the angle of incidence and sine of the angle of refraction is equal to the ratio of refractive indices of the two media

$$\frac{\sin i}{\sin r} = \frac{\mu 2}{\mu 1}$$

16. Draw a ray diagram to show the image formed by a convex lens when the object is placed between F and 2F



17. Define dispersion of light

When a beam of white light or composite light is refracted through any transparent media, it is split into its component colours. This phenomenon is called as 'dispersion of light'

18. State Rayleigh scattering law .

The amount of scattering of light is inversely proportional to the fourth power of its wavelength"

19. Differentiate convex lens and concave lens.

S. No	Convex Lens	Concave Lens
1	A convex lens is thicker in the middle than at edges.	A concave lens is thinner in the middle than at edges.
2	It is a converging lens.	It is a diverging lens.
3	It produces mostly real images.	It produces virtual images.
4	It is used to treat hypermeteropia.	It is used to treat myopia.

20. What is power of accommodation of eye?

The ability of the eye lens to focus nearby as well as the distant objects is called power of accommodation of the eye

21. What are the causes of 'Myopia'?

i) lengthening of eye ball ii) focal length of eye lens is reduced

22. Why does the sky appear in blue colour?

According to rayleigh's scattering law the blue colour(shorter wavelength) is scattered to a greater extent than the red colour (longer wavelength). This scattering causes the sky to appear in blue colour.

23. Define refraction.

When a ray of light travels from one transparent medium into another obliquely, it gets deiviated from its path.. This deviation of ray of light is called refraction.

24. Differenciate elasic and inelastic scattering.

Elastic scattering	In – elastic scattering
No loss in energy	Loss in energy occurs
Ex: Tyndall , Rayleigh scattering etc	Ex: Raman scattering

25. What is Rayleigh scattering?

The scattering of light by air molecules is called Rayleigh scattering

26. Define tyndall scattering.

The scattering of light by colloidal particles is called Tyndall scattering

27. Define mei scattering?

Mie scattering takes place when the diameter of the scatterer is similar to or larger than the wavelength of the incident light

28. Define Raman scattering

The interaction of light ray with the particles of pure liquids or transparent solids, which leads to a change in wavelength or frequency.

29. Write the applications of concave lens.

1. Concave lenses are used as eye lens of Galilean Telescope'
2. They are used in wide angle spy hole in doors
3. They are are used to correct the defect of vision called 'myopia

30. Write the applications of convex lens.

1. Convex lenses are used as camera lenses 2. They are used as magnifying lenses

3. They are used in making microscope, telescope and slide projectors

4. They are used to correct the defect of vision called hypermetropia

31. Define magnification of a lens.

It is defined as the ratio of the height of the image to the height of an object.

$$\frac{height\ of\ the\ image}{height\ of\ the\ object}$$

32. Define power of a lens

Power of a lens is numerically defined as the reciprocal of its focal length..

$$P = \frac{1}{f}$$

33. Define one calorie

One calorie is defined as the amount of heat energy required to rise the temperature of 1 gram of water through 1°C

34. Distinguish between linear, areal or superficial expansion

Linear expansion	Areal or superficial expansion
Length of the body changes due to change in temperature	Area of the solid body changes due to heating
$\frac{\Delta L}{L0} = \alpha_L \Delta T$	$\frac{\Delta A}{A0} = \alpha_A \Delta T$

35. State Boyle's law

When the temperature of a gas is kept constant, the volume of a fixed mass of gas is inversely proportional to its pressure

36. State-the law of volume or charles law.

When the pressure of gas is kept constant, the volume of a gas is directly proportional to the temperature of the gas. V α T

37. Distinguish between ideal gas and real gas.

Ideal gas	**Real gas**
Atom or molecules of the gases do not interact with each other	Atom or molecules of the gases interact with each other
At low pressure and at high temperature the force of attraction between the atoms or molecules are weak	At low pressure and at high temperature the force of attraction between the atoms or molecules are strong

38. What is co-efficient of real expansion?

Coefficient of real expansion is defined as the ratio of the true rise in the volume of the liquid per degree rise in temperature to its unit volume.

39. What is co-efficient of apparant expansion?

Coefficient of apparent expansion is defined as the ratio of the apparent rise in the volume of the liquid per degree rise in temperature to its unit volume

40. Define thermal equilibrium.

Two or more physical systems or bodies are said to be in thermal equilibrium if there is no net flow of thermal energy between the systems

41. What are the characteristics feature of heat energy transfer?

1. Heat always flows from a system at higher temperature to a system at lower temperature.
2. The mass of a system is not altered when it is heated or cooled.
3. For any exchange of heat, *Heat gained = Heat lost*

42. Define the unit of current.

When a charge of one coulomb fl ows across any cross-section of a conductor, in one second is called one ampere.

43. What happens to the resistance, as the conductor is made thicker?

Since resistance is inversely proportional to area of cross section, the resistance of the conductor is decreases.

44. Why is tungsten metal used in bulbs, but not in fuse wires?

1. Tungsten has very high melting point
2. For fuse wire the material with low melting point should be used.

45. Name any two devices, which are working on the heating effect of the electric current.

1. Electric heater
2. Electric iron

46. Define current.

It is defined **as the rate of fl ow of charges in a conductor**

47. Define electric power.

The electric power is the product of the electric current and the potential difference

48. Define electric potential .

The amount of work done in moving a unit positive charge from infinity to one point against the electric force is called electric potential

49. Define potential difference.

The amount of work done in moving a unit positive charge from one point to other point against the electric force is called potential difference

50. State Ohm's law

At a constant temperature, the steady current 'I' flowing through a conductor is directly proportional to the potential difference 'V' between the two ends of the conductor

51. Distinguish between the resistivity and conductivity of a conductor

Resistivity	**Conductivity**
The resistance of a conductor of unit length and unit area of cross section	Reciprocal of resistivity
Unit : ohm metre	Unit : mho metre^{-1}

52. What connection is used in domestic appliances and why?

1. Parallel connection
2. To get the proper voltage and current
3. To put ON/OFF independently

53. What is a longitudinal wave?

A longitudinal wave is a wave in which the particles of the medium vibrate along the direction of propagation of the wave.

54. What is the audible range of frequency?

20 Hz to 20000 Hz

55. What is the minimum distance needed for an echo?

The minimum distance needed for an echo is 1/20 times the speed of sound

56. What will be the frequency sound having 0.20 m as its wavelength, when it travels with a speed of 331 m s_{-1}?

$V = n\lambda$

$$n = \frac{v}{\lambda} = \frac{331}{0.2} = 1655\text{Hz}$$

57. What are ultrasonic waves?

1. Sound waves with frequency more than 20000Hz
2. Example : waves produced by bats

58. What are infra sound waves?

1. Sound waves with frequency more than 20000Hz
2. Example : waves produced by whales

59. Write the difference between sound and light waves.

S.No.	SOUND	LIGHT
1	Medium is required for the propagation.	Medium is not required for the propagation.
2	Sound waves are longitudinal.	Light waves are transverse.
3	Wavelength ranges from 1.65 cm to 1.65 m.	Wavelength ranges from 4×10^{-7} m to 7×10^{-7} m.
4	Sound waves travel in air with a speed of about 340 m s^{-1} at NTP.	Light waves travel in air with a speed of 3×10^{8} m s^{-1}.

60. Define particle velocity.

The velocity with which the particles of the medium vibrate in order to transfer the energy in the form of a wave is called particle velocity

61. Define wave velocity.

The velocity with which the wave travels through the medium is called wave velocity.

62. What is doppler effect?

When ever there is a relative motion between a source and a listener, the frequency of the sound heard by the listener is different from the original frequency of sound emitted by the source. This is known as "Doppler effect"

63. Name three animals, which can hear ultrasonic vibrations.

Mosquito , dogs and bats

64. Write application of echo.

1. Communication over long distance
2. Used in obstetric ultrasonography
3. Used to determine the velocity of sound waves

65. If A is a radioactive element which emits an α - particle and produces $_{104}Rf^{259}$. Write the atomic number and mass number of the element A

$_{106}A^{263}$ -----→ $_{104}Rf^{259}$ + $_{2}He^{4}$

66. Write any three features of natural and artificial radioactivity.

Natural radioactivity	Artificial radio activity
Spontaneous process	Induced process
Cannot be controlled	Can be controlled
Alpha , beta , gamma radiations are emitted	Elementary particles are emitted
Exhibited by elements atomic number greater	Exhibited by elements atomic number

than 83	lesser than 83

67. Define critical mass.
    1. The minimum mass of a fi ssile material necessary to sustain the chain reaction is called 'critical mass
    2. It depends on the nature, density and the size of the fi ssile material
68. Define one roentgen.

    One roentgen is defined as the quantity of radioactive substance which produces a charge of 2.58×10^{-4} coulomb in 1 kg of air at STP
69. State Soddy and Fajan's displacement law

    (i) When a radioactive element emits an alpha particle, a daughter nucleus is formed whose mass number is less by 4 units and the atomic number is less by 2 units, than the mass number and atomic number of the parent nucleus.

    (ii) When a radioactive element emits a beta particle, a daughter nucleus is formed whose mass number is the same and the atomic number is more by 1 unit, than the atomic number of the parent nucleus
70. What is stellar energy?

    The stars like our Sun emit a large amount of energy in the form of light and heat.
71. Give any two uses of radio isotopes in the field of agriculture?
    1. P^{32} – increases the productivity of crops
    2. To kill the insects and parasites
    3. To keep the foods remain fresh
72. Define one curie.

    It is defined as the quantity of a radioactive substance which undergoes $3.7 \times 10_{10}$ disintegrations in one second.
73. Differentiate nuclear fission and nuclear fusion.

Nuclear fission	**Nuclear fusion**
Heavy nucleus is splitted into two lighter nuclei by bombardment	Two lighter nuclei fused to form a heavy nucleus
It happened at any temperature	It happenned only at very high temperature
Dangerous Gamma radiation is emitted	Elementary particles are emitted
Energy released per fission is 200MeV	Energy released per fusion is 24MeV

74. List the preventive measures to protect from radiation.

1. Radioactive materials should kept in lead container
2. Lead coated aprons, gloves should be uesd.
3. Radioactive materials can be controlled by remote control systems
4. Dosimeter can be used to check the radiation

75. Define one electron volt.

The amount of energy required to accelerate one coulomb of charge by a potential of one volt.

NUMERICAL PROBLEMS:

1. Calculate the velocity of a moving body of mass 5 kg whose linear momentum is 2.5 $kg\ m\ s^{-1}$.
2. A door is pushed, at a point whose distance from the hinges is 90 cm, with a force of 40 N. Calculate the moment of the force about the hinges.
3. Two bodies have a mass ratio of 3:4 The force applied on the bigger mass produces an acceleration of 12 ms^{-2}.What could be the acceleration of the other body, if the same force acts on it
4. A mechanic unscrew a nut by applying a force of 140 N with a spanner of length 40 cm. What should be the length of the spanner if a force of 40 N is applied to unscrew the same nut?
5. A beam of light passing through a diverging lens of focal length 0.3m appear to be focused at a distance 0.2m behind the lens. Find the position of the object.
6. An object is placed at a distance 20cm from a convex lens of focal length 10cm. Find the image distance and nature of the image.
7. An object of height 3cm is placed at 10cm from a concave lens of focal length 15cm. Find the size of the image
8. A person with myopia can see objects placed at a distance of 4m. If he wants to see objects at a distance of 20m, what should be the focal length and power of the concave lens he must wear?
9. For a person with hyper meteropia, the near point has moved to 1.5m. Calculate the focal length of the correction lens in order to make his eyes normal.
10. A container whose capacity is 70 ml is filled with a liquid up to 50 ml. Then, the liquid in the container is heated. Initially, the level of the liquid falls from 50 ml to 48.5 ml. Then we heat more, the level of the liquid rises to 51.2 ml. Find the apparent and real expansion

11. Calculate the coefficient of cubical expansion of a zinc bar. Whose volume is increased 0.25 m^3 from 0.3 m^3 due to the change in its temperature of 50 K.
12. A charge of 12 coulomb fl ows through a bulb in 5 second. What is the current through the bulb?
13. The work done in moving a charge of 10 C across two points in a circuit is 100 J. What is the potential difference between the points?
14. Calculate the resistance of a conductor through which a current of 2 A passes, when the potential difference between its ends is 30 V.
15. The resistance of a wire of length 10 m is 2 ohm. If the area of cross section of the wire is 2×10^{-7} m^2, determine its (i) resistivity (ii) conductance and (iii) conductivity
16. Three resistors of resistances 5 ohm, 3 ohm and 2 ohm are connected in series with 10 V battery. Calculate their effective resistance and the current flowing through the circuit.
17. An electric heater of resistance 5 Ω is connected to an electric source. If a current of 6 A flows through the heater, then find the amount of heat produced in 5 minutes
18. Calculate the current and the resistance of a 100 W, 200 V electric bulb in an electric circuit.
19. Two resistors when connected in parallel give the resultant resistance of 2 ohm; but when connected in series the effective resistance becomes 9 ohm. Calculate the value of each resistance.
20. How many electrons are passing per second in a circuit in which there is a current of 5 A?
21. At what temperature will the velocity of sound in air be double the velocity of sound in air at 0^o C?
22. A source producing a sound of frequency 500 Hz is moving towards a listener with a velocity of 30 m s^{-1}. The speed of the sound is 330 m s^{-1}. What will be the frequency heard by listener?
23. A sound wave has a frequency of 200 Hz and a speed of 400 m s^{-1} in a medium. Find the wavelength of the sound wave.
24. A strong sound signal is sent from a ship towards the bottom of the sea. It is received back after 1s.What is the depth of sea given that the speed of sound in water 1450 m s^{-1}?
25. $_{92}\mathbf{U}^{235}$ experiences one **α -** decay and one **β -** decay. Find number of neutrons in the final daughter nucleus that is formed.
26. Calculate the amount of energy released when a radioactive substance undergoes fusion and results in a mass defect of 2 kg

27. A cobalt specimen emits induced radiation of 75.6 millicurie per second. Convert this disintegration in to becquerel (one curie = 3.7×10^{10} Bq)

Detailed questions:

1. What are the types of inertia? Give an example for each type.
2. Deduce the equation of a force using Newton's second law of motion.
3. State and prove the law of conservation of linear momentum.
4. Describe rocket propulsion.
5. State the universal law of gravitation and derive its mathematical expression
6. Give the applications of gravitation
7. List any five properties of light
8. Differentiate the eye defects: Myopia and Hypermetropia
9. Explain the construction and working of a 'Compound Microscope'.
10. Explain the construction and working of a 'simple Microscope'.
11. Derive the ideal gas equation.
12. Explain the experiment of measuring the real and apparent expansion of a liquid with a neat diagram.
13. With the help of a circuit diagram derive the formula for the resultant resistance of three resistances connected: a) in series and b) in parallel
14. a) State Joule's law of heating.
    b) An alloy of nickel and chromium is used as the heating element. Why?
    c) How does a fuse wire protect electrical appliances?
15. a) What are the advantages of LED TV over the normal TV?
    b) List the merits of LED bulb
16. What are the factors that affect the speed of sound in gases?
17. a) What do you understand by the term 'ultrasonic vibration'?
    b) State three uses of ultrasonic vibrations.
    c) Name three animals which can hear ultrasonic vibrations.
18. a) What is an echo?
    b) State two conditions necessary for hearing an echo.
    c) What are the medical applications of echo?
19. Compare the properties of alpha, beta and gamma radiations.
20. What is a nuclear reactor? Explain its essential parts with their functions.

CHEMISTRY

I CHOOSE THE CORRECT ANSWER:

1. Which of the following has the smallest mass?

   a. 6.023×10^{23} atoms of He **b. 1 atom of He** c. 2 g of He d. 1 mole atoms of He

2. Which of the following is a triatomic molecule?

   a. Glucose b. Helium c**. Carbon dioxide** d. Hydrogen

3. The volume occupied by 4.4 g of CO_2 at S.T.P

   a. 22.4 litre **b. 2.24 litre** c. 0.24 litre d. 0.1 litre

4. 4. Mass of 1 mole of Nitrogen atom is

   a. 28 amu b. 14 amu c. 28 g **d. 14 g**

5. Which of the following represents 1 amu?

   a. Mass of a C – 12 atom b. Mass of a hydrogen atom

   c. 1/12th of the mass of a C – 12 atom d. Mass of O – 16 atom

6. Which of the following statement is incorrect?

   a) **One gram of C – 12 contains Avogadro's number of atoms.**

   b) One mole of oxygen gas contains Avogadro's number of molecules.

   c) **One mole of hydrogen gas contains Avogadro's number of atoms.**

   d) One mole of electrons stands for 6.023×10^{23} electrons.

7. The volume occupied by 1 mole of a diatomic gas at S.T.P is

   a. 11.2 litre b. 5.6 litre **c. 22.4 litre** d. 44.8 litre

8. In the nucleus of $_{20}Ca^{40}$, there are

   a. 20 protons and 40 neutrons **b. 20 protons and 20 neutrons**

   c. 20 protons and 40 electrons d. 40 protons and 20 electrons

9. The gram molecular mass of oxygen molecule is

   a. 16 g b. 18 g **c. 32 g** d. 17 g

10. 1 mole of any substance contains ____ molecules.

    a. 6.023×10^{23} b. 6.023×10^{-23} c. 3.0115×10^{23} d. 12.046×10^{23}

11. The number of periods and groups in the periodic table are_____.

    a) 6,16 b) 7,17 c) 8,18 **d) 7,18**

12. The basis of modern periodic law is_____.

    a) atomic number b) atomic mass c) isotopic mass d) number of neutrons

13. _____ group contains the member of halogen family.

    a) 17th b) 15th c) 18th d) 16th

14. _____ is a relative periodic property

    a) atomic radii b) ionic radii c) electron affinity **d) electronegativity**

15. Chemical formula of rust is _____.

    a) $FeO.xH_2O$ b) $FeO_4.xH_2O$ **c) $Fe_2O_3.xH_2O$** d) FeO

16. In the alumino thermic process the role of Al is _____.

    a) oxidizing agent **b) reducing agent** c) hydrogenating agent d) sulphurising agent

17. The process of coating the surface of metal with a thin layer of zinc is called_____.

    a) painting b) thinning **c) galvanization** d) electroplating

18. Which of the following have inert gases 2 electrons in the outermost shell.

    a) He b) Ne c) Ar d) Kr

19. Neon shows zero electron affinity due to _____.

    a) stable arrangement of neutrons **b) stable configuration of electrons**

    c) reduced size d) increased density

20. _____ is an important metal to form amalgam.

    a) Ag **b) Hg** c) Mg d) Al

21. A solution is a _____ mixture.

    a. homogeneous b. Heterogeneous c. homogeneous and heterogeneous d. non homogeneous

22. The number of components in a binary solution is _____

    a. 2 b. 3 c. 4 d. 5

23. Which of the following is the universal solvent?

    a. Acetone b. Benzene **c. Water** d. Alcohol

24. A solution in which no more solute can be dissolved in a definite amount of solvent at a given temperature is called _____

    a. Saturated solution b. Un saturated solution c. Super saturated solution d. Dilute solution

25. Identify the non aqueous solution a

    a. sodium chloride in water b. glucose in water

    c. copper sulphate in water **d. sulphur in carbon-di-sulphide**

26. When pressure is increased at constant temperature the solubility of gases in liquid _____.

    a. No change **b. Increases** c. decreases d. no reaction

27. Solubility of NaCl in 100 ml water is 36 g. If 25 g of salt is dissolved in 100 ml of water how much more salt is required for saturation _____.

    a. 12g **b. 11g** c. 16g d. 20g

28. A 25% alcohol solution means

    a. 25 ml alcohol in 100 ml of water b. 25 ml alcohol in 25 ml of water

    c. 25 ml alcohol in 75 ml of water d. 75 ml alcohol in 25 ml of water

29. Deliquescence is due to _____

    a**. Strong affinity to water** b. Less affinity to water c. Strong hatred to water d. Inertness to water

30. Which of the following is hygroscopic in nature?

    a. ferric chloride b. copper sulphate penta hydrate **c. silica gel** d. none of the above

31. $H_2(g) + Cl_2(g) \rightarrow 2HCl(g)$ is a

    a. Decomposition Reaction **b. Combination Reaction**

    c. Single Displacement Reaction d. Double Displacement Reaction

32. Photolysis is a decomposition reaction caused by _____

    a. heat b. Electricity **c. light** d. mechanical energy

33. The reaction between carbon and oxygen is represented by $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + Heat$. In which of the type(s), the above reaction can be classified?

    (i) Combination Reaction(ii) Combustion Reaction (iii) Decomposition Reaction (iv) Irreversible Reaction

    a. i and ii b. i and iv c. i, ii and iii **d. i, ii and iv**

34. The chemical equation $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)}\downarrow + 2NaCl_{(aq)}$ represents which of the following types of reaction?

    a. Neutralisation b. Combustion **c. Precipitation** d. Single displacement

35. Which of the following statements are correct about a chemical equilibrium?

    (i) It is dynamic in nature

    (ii) The rate of the forward and backward reactions are equal at equilibrium

    (iii) Irreversible reactions do not attain chemical equilibrium

    (iv) The concentration of reactants and products may be different

    a. i, ii and iii b. i, ii and iv c. ii, iii and iv d. i, iii and iv

36. A single displacement reaction is represented by $X_{(s)} + 2HCl_{(aq)} \rightarrow XCl_{2(aq)} + H_{2(g)}$. Which of

    the following(s) could be X. (i) Zn (ii) Ag (iii) Cu (iv) Mg. Choose the best pair.

    a. i and ii b. ii and iii c. iii and iv **d. i and iv**

37. Which of the following is not an "element + element → compound" type reaction?

    a. $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ b. $2K_{(s)} + Br_{2(l)} \rightarrow 2KBr_{(s)}$

c. $2CO_{(g)} + O_{2(g)} \rightarrow 2CO_{2(g)}$ d. $4Fe_{(s)} + 3O_{2(g)} \rightarrow 2Fe_2O_{3(s)}$

38. Which of the following represents a precipitation reaction?

a. $A_{(s)} + B_{(s)} \rightarrow C_{(s)} + D_{(s)}$ b. $A_{(s)} + B_{(aq)} \rightarrow C_{(aq)} + D_{(l)}$ **c. $A_{(aq)} + B_{(aq)} \rightarrow C_{(s)} + D_{(aq)}$** d. $A_{(aq)} + B_{(s)} \rightarrow C_{(aq)} + D_{(l)}$

39. The pH of a solution is 3. Its $[OH^-]$ concentration is

a. 1×10^{-3} M b. 3 M **c. 1×10^{-11} M** d. 11 M

40. Powdered $CaCO_3$ reacts more rapidly than flaky $CaCO_3$ because of _____.

a. large surface area b. high pressure c. high concentration d. high temperature

41. The molecular formula of an open chain organic compound is C_3H_6. The class of compound is

a. alkane **b. Alkene** c. alkyne d. Alcohol

42. The IUPAC name of an organic compound is 3-Methyl butan-1-ol. What type compound it is?

a. Aldehyde b. Carboxylic acid c. Ketone **d. Alcohol**

43. The secondary suffix used in IUPAC nomenclature of an aldehyde is ____

a. - ol b. – oic acid **c. - al** d. – one

44. Which of the following pairs can be the successive members of a homologous series?

a. C_3H_8 and C_4H_{10} b. C_2H_2 and C_2H_4 c. CH_4 and C_3H_6 d. C_2H_5OH and C_4H_8OH

45. $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$ is a

a. Reduction of ethanol **b. Combustion of ethanol**

c. Oxidation of ethanoic acid d. Oxidation of ethanal

46. Rectified spirit is an aqueous solution which contains about _____ of ethanol

a. 95.5 % b. 75.5 % c. 55.5 % d. 45.5 %

47. Which of the following are used as anaesthetics?

a. Carboxylic acids **b. Ethers** c. Esters d. Aldehydes

48. TFM in soaps represents _____ content in soap

a. mineral b. Vitamin **c. fatty acid** d. Carbohydrate

49. Which of the following statements is wrong about detergents?

a. It is a sodium salt of long chain fatty acids b. It is sodium salts of sulphonic acids

c. The ionic part in a detergent is $-SO_3^-Na^+$ d. It is effective even in hard water.

Fill up the blanks:

1. Atoms of different elements having _____ mass number, but _____ atomic numbers are called isobars
2. Atoms of different elements having same number of _____ are called isotones.
3. Atoms of one element can be transmuted into atoms of other element by _____
4. The sum of the numbers of protons and neutrons of an atom is called its _____
5. Relative atomic mass is otherwise known as _____
6. The average atomic mass of hydrogen is _____ amu.
7. If a molecule is made of similar kind of atoms, then it is called _____ atomic molecule.
8. The number of atoms present in a molecule is called its _____
9. One mole of any gas occupies _____ ml at S.T.P
10. Atomicity of phosphorous is _____
11. If the electronegativity difference between two bonded atoms in a molecule is greater than 1.7, the nature of bonding is _____
12. _____ is the longest period in the periodical table.
13. _____ forms the basis of modern periodic table.
14. If the distance between two Cl atoms in Cl_2 molecule is 1.98Å, then the radius of Cl atom is _____.
15. Among the given species A^-,A^+, and A, the smallest one in size is _____.
16. The scientist who propounded the modern periodic law is _____.
17. Across the period, ionic radii _____ (increases,decreases).
18. _____ and _____ are called inner transition elements.
19. The chief ore of Aluminium is _____.
20. The chemical name of rust is _____.
21. The component present in lesser amount, in a solution is called _____
22. Example for liquid in solid type solution is _____
23. Solubility is the amount of solute dissolved in _____ g of solvent.
24. Polar compounds are soluble in _____ solvents
25. Volume persentage decreases with increases in temperature because _____
26. A reaction between an acid and a base is called _____.
27. When zinc metal is placed in hydrochloric acid, _____ gas is evolved.
28. The equilibrium attained during the melting of ice is known as _____.

29. The pH of a fruit juice is 5.6. If you add slaked lime to this juice, its pH _____
30. The value of ionic product of water at 25^0 C is _____.
31. The normal pH of human blood is _____
32. An atom or a group of atoms which is responsible for chemical characteristics of an organic compound is called _____.
33. The general molecular formula of alkynes is _____
34. In IUPAC name, carbon skeleton of a compound is represented by ___ (root word / prefix / suffix)
35. (Saturated / Unsaturated) _____ compounds decolourize bromine water.
36. Dehydration of ethanol by conc. Sulphuric acid forms _____ (ethene/ ethane)
37. 100 % pure ethanol is called _____
38. Ethanoic acid turns _____ litmus to _____
39. The alkaline hydrolysis of fatty acids is termed as _____
40. Biodegradable detergents are made of _____(branched / straight) chain hydrocarbons

ANSWERS :

1. Same, Different	**21. Solute**
2. Neutrons	**22. Amalgum**
3. Artificial Transmutation	**23. Hundred**
4. Mass Number	**24. Polar**
5. Standard Atomic Weight	**25. Expansion of Liquids**
6. 1.008	**26. Neutralisation**
7. Homo	**27. Hydrogen**
8. Atomicity	**28. Physical Equilibrium**
9. 22400	**29. Increase**
10. 4	**30. 1×10^{-14} mol^2 dm^{-6}**
11. Ionic	**31. 7.35 – 7.45**
12. 6^{th}	**32. Functional Group**
13. Atomic Number	**33. $C_n H_{2n-2}$**
14. 0.99 A^o	**34. Rootword**
15. A^+	**35. Unsaturated**
16. Henry Mosley	**36. Ethene**

17. Decreases	**37. Absolute Alcohol**
18. Lanthanides, Actinides	**38. Blue, Red**
19. Bauxite	**39. Saponification**
20. Hydrated Ferric Oxide	**40. Straight**

MATCH THE FOLLOWING:

III. Match the following

1.	8 g of O_2	- 4 moles	4
2.	4 g of H_2	- 0.25 moles	1
3.	52 g of He	- 2 moles	2
4.	112 g of N_2	- 0.5 moles	5
5.	35.5 g of Cl_2	- 13 moles	3

3.

III. Match the following

1. Galvanisation	:	Noble gas elements	5
2. Calcination	:	Coating with Zn	1
3. Redox reaction	:	Silver-tin amalgam	
4. Dental filling	:	Alumino thermic process	4
5. Group 18 elements	:	Heating in the absence of air	3
			2

4.

III. Match the following

1. Blue vitriol	-	$CaSO_4 \cdot 2H_2O$	2
2. Gypsum	-	CaO	4
3. Deliquescence	-	$CuSO_4 \cdot 5H_2O$	1
4. Hygroscopic	-	$NaOH$	3

III. Match the following

Functional group –OH	-	Benzene	5
Heterocyclic	-	Potassium stearate	4
Unsaturated	-	Alcohol	1
Soap	-	Furan	2
Carbocyclic	-	Ethene	3

5.

III. Match the following

1. Identify the types of reaction

REACTION	TYPE	
$NH_4OH_{(aq)} + CH_3COOH_{(aq)} \rightarrow CH_3COONH_{4(aq)} + H_2O_{(l)}$	Single Displacement	2
$Zn_{(s)} + CuSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$	Combustion	4
$ZnCO_{3(s)} \xrightarrow{Heat} ZnO_{(s)} + CO_{2(g)}$	Neutralisation	1
$C_2H_{4(g)} + 4O_{2(g)} \rightarrow 2CO_{2(g)} + 2H_2O_{(g)} + Heat$	Thermal decomposition	3

ASSERTION AND REASON:

Answer the following questions using the data given below:

i) A and R are correct, R explains the A. ii) A is correct, R is wrong. iii) A is wrong, R is correct.

iv) A and R are correct, R doesn't explains A

1. **Assertion:** Atomic mass of aluminium is 27 **(iv)**
   Reason: An atom of aluminium is 27 times heavier than 1/12th of the mass of the C – 12 atom.
2. **Assertion:** The Relative Molecular Mass of Chlorine is 35.5 a.m.u. **(iii)**
   Reason: The natural abundance of Chlorine isotopes are not equal.
3. **Assertion :** The nature of bond in HF molecule is ionic **(iii)**
   Reason : The electronegativity difference between H and F is 1.9
4. **Assertion :** Magnesium is used to protect steel from rusting**(i)**
   Reason : Magnesium is more reactive than iron
5. **Assertion :** An uncleaned copper vessel is covered with greenish layer. **(iv)**
   Reason : copper is not attacked by alkali
6. **Assertion**: Detergents are more effective cleansing agents than soaps in hard water. **(i)**
   Reason: Calcium and magnesium salts of detergents are water soluble.
7. **Assertion**: Alkanes are saturated hydrocarbons. **(iv)**
   Reason: Hydrocarbons consist of covalent bonds

TRUE OR FALSE: (IF FALSE GIVE THE CORRECT STATEMENT)

1. Two elements sometimes can form more than one compound. **T**
2. Noble gases are Diatomic. **F (Monoatomic)**
3. The gram atomic mass of an element has no unit. **F(Unit Gram)**
4. 1 mole of Gold and Silver contain same number of atoms. **T**
5. Molar mass of CO_2 is 42g. **F (44g)**
6. Moseley's periodic table is based on atomic mass. **F(Atomic Number)**
7. Ionic radius increases across the period from left to right **F(Decreases)**
8. All ores are minerals; but all minerals cannot be called as ores. **T**
9. Al wires are used as electric cables due to their silvery white colour. **F(Good Conductivity)**
10. An alloy is a heterogenous mixture of metals. **F(Homogeneous)**

11. Solutions which contain three components are called binary solution. **F(Tertiary Solution)**
12. In a solution the component which is present in lesser amount is called solvent. **F(Solute)**
13. Sodium chloride dissolved in water forms a non-aqueous solution. **F(aqueous)**
14. The molecular formula of green vitriol is $MgSO_4.7H_2O$ **F($FeSO_4$ $7H_2O$)**
15. When Silica gel is kept open, it absorbs moisture from the air, because it is hygroscopic in nature. **T**
16. Silver metal can replace hydrogen gas from nitric acid. **F(cannot replace)**
17. The pH of rain water containing dissolved gases like SO_3,CO_2,NO_2 will be less than 7. **T**
18. At the equilibrium of a reversible reaction, the concentration of the reactants and the products will be equal. **T**
19. Periodical removal of one of the products of a reversible reaction increases the yield.**T**
20. On dipping a pH paper in a solution, it turns into yellow. Then the solution is basic. **F(Acidic)**

SHORT ANSWER QUESTIONS:

1. Define : Relative atomic mass.

   Relative atomic mass of an element is the ratio between the mass of one atom of the element to 1/12th of the mass of the atom of carbon -12.

2. Write the different types of isotopes of oxygen and its percentage abundance.

Isotope	Mass (amu)	% abundance
$_8O^{16}$	15.9949	99.757
$_8O^{17}$	16.9991	0.038
$_8O^{18}$	17.9992	0.205

3. Define : Atomicity

   The number of atoms present in the molecule is called its '**atomicity**'**.**

4. Give any two examples for heterodiatomic molecules.

   HCl and CO

5. What is Molar volume of a gas?

   One mole of any gas occupies 22.4 litre or 22400 ml at S.T.P. This volume is called as molar volume.

6. Find the percentage of nitrogen in ammonia

   The percentage of nitrogen in ammonia = $\frac{mass\ of\ nitrogen}{molar\ mass\ of\ NH3}$ X 100

$$= \frac{14}{17} \ X\ 100$$

$$= 82.35\%$$

7. Define average atomic mass.

   The average atomic mass of an element is the weighted average of the masses of its naturally occurring isotopes.

8. Differenciate atom and molecules.

Atom	Molecule
An atom is the smallest particle of an element	A molecule is the smallest particle of an element or compound.
Atom does not exist in free state except in a noble gas	Molecule exists in free a state
Except some of noble gas, other atoms are highly reactive	Molecules are less reactive
Atom does not have a chemical bond	Atoms in a molecule are held by chemical bonds

9. State Avagadro's law

   "Equal volumes of all gases under similar conditions of temperature and pressure contain equal

   number of molecules"

10. List the applications of Avagadro's law

    i. It explains Gay-Lussac's law.

    ii. It helps in the determination of atomicity of gases.

    iii. Molecular formula of gases can be derived using Avogadro's law

    iv. It determines the relation between molecular mass and vapour density.

    v. It helps to determine gram molar volume of all gases (i.e, 22.4 litre at S.T.P

11. Define mole.

    The ***mole (mol)*** **is** ***the amount of a substance that contains as many elementary entities (atoms, molecules, or other particles) as there are atoms in exactly 12 g of the carbon-12 isotope***

12. A is a reddish brown metal, which combines with O_2 at < 1370 K gives B, a black coloured

compound. At a temperature > 1370 K, A gives C which is red in colour. Find A,B and C with reaction.

i) A – copper

ii) B - copper II oxide $2\,Cu + O_2 \xrightarrow{\text{below 1370K}} 2\,CuO$ (copper II oxide- black)

iii) C- copper I oxide $4\,Cu + O_2 \xrightarrow{\text{above 1370K}} 2\,Cu_2O$ (copper I oxide – red)

13. A is a silvery white metal. A combines with O_2 to form B at 800^oC, the alloy of A is used in making the aircraft. Find A and B

i) A – Aluminium

ii) B – Aluminium oxide

$4\,Al + 3\,O_2 \rightarrow 2\,Al_2O_3$(Aluminium oxide)

14. What is rust? Give the equation for formation of rust.

When iron is exposed to moist air, it forms a layer of brown hydrated ferric oxide on its surface

$4\,Fe + 3O_2 + x\,H_2O\ 2\,Fe_2O_3 . xH_2O$(rust)

15. State two conditions necessary for rusting of iron.

i) Moist air

ii) Presence of oxygen

iii) Presence of water

16. Define ionisation energy.

Ionisation energy is the minimum energy required to remove an electron from a gaseous atom in its ground state to form a cation.

17. Define electron affinity?

Electron affinity is the amount of energy released when a gaseous atom gains an electron to form its anion

18. What are the uses of aluminium.

i) household utensils

ii) electrical cable industry

iii) making aeroplanes and other industrial machine parts

19. A greenish layer is occurred in the copper vessel. Justify.

i) When copper is in action with air and moisture copper carbonate is formed.

ii) $2\ Cu + O_2 + CO_2 + H_2O \rightarrow CuCO_3.Cu(OH)_2$

iii) Copper carbonate forms the greenish layer

20. What is an amalgam?

An amalgam is an alloy of mercury with another metal.

21. What are the type of alloys?

i) Ferrous alloys: Contain Iron as a major component. Ex:Stainless Steel, Nickel Steel etc.

ii) Non-ferrous alloys: These alloys do not contain Iron as a major component.

Ex:, Aluminium alloy, Copper alloy etc

22. What is meant by binary solution?

Solutions which are made of one solute and one solvent (two components) are called **binary solutions**.

23. What is aqueous and non-aqueous solution? Give an example.

i) **Aqueous solution:** The solution in which water acts as a solvent is called aqueous solution

Ex: Common salt in water

ii) **Non – Aqueous solution:** The solution in which any liquid, other than water, acts as a

solvent is called nonaqueous solution

Ex: Sulphur dissolved in carbon disulphide .

24. The aquatic animals live more in cold region Why?

i) The aquatic animals are lived with the help of dissolved oxygen in water

ii) At low temperature the solubility of oxygen is more

25. Define Hydrated salt

The number of water molecules found in the crystalline substance is called **water of crystallization**.

Such salts are called hydrated salts . Ex: blue vitriol : $CuSO_4 . 5H_2O$

26. Classify the following substances into deliquescent, hygroscopic.

Conc. Sulphuric acid, Copper sulphate penta hydrate, Silica gel, Calcium chloride and Gypsum salt

Hygroscopic	Deliquescent
Conc. Sulphuric acid	Copper sulphate penta hydrate
Silica gel	Calcium chloride
	Gypsum salt

27. Define solubility.

    Solubility is defined as the number of grams of a solute that can be dissolved in 100 g of a solvent to form its saturated solution at a given temperature and pressure

28. Why does the reaction rate of a reaction increase on raising the temperature?

    i) The reaction rate is fast at higher temperature

    ii) At higher temperature more energy is released by breaking the bond

    iii) This energy helps to speed up the reaction

29. Define combination reaction. Give one example for an exothermic combination reaction.

    A combination reaction is a reaction in which two or more reactants combine to form a compound

    $H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)}$

30. Differentiate reversible and irreversible reactions

Reversible process	Irreversible process
It can be reversed	It cannot be reversed.
It attains equilibrium	Equilibrium is not attained
The reactants cannot be converted completely into products	The reactants can be converted completely into products
It is a slow process	It is a fast process

31. What happens during a chemical reaction?

    i) In a chemical reaction, the reacting molecules or elements are rearranged to form new molecules.

    ii) Old chemical bonds between atoms are broken and new chemical bonds are formed.

    iii) Bond breaking absorbs energy

    iv) Bond formation releases energy

32. Define decomposition reaction.

    In a decomposition reaction, a single compound splits into two or more simpler substances under suitable conditions

33. A iron nail dipped in copper sulphate solution turns the colour of the solution. Justify .

    i) Here the displacement reaction occurs

    $Fe_{(s)} + CuSO_{4(aq)} \square FeSO_{4(aq)} + Cu_{(s)}$

    ii) Since Iron is more reactive than copper it displaced copper from copper sulphate solution

34. Define P^H value.

    The pH is the negative logarithm of the hydrogen ion concentration pH = – $\log_{10}[H^+]$

35. Name the simplest ketone and give its structural formula

    i) Acetone (or) propanone

    ii) CH_3COCH_3

36. How is ethanoic acid prepared from ethanol? Give the chemical equation

    Ethanoic acid is prepared from ehanol by oxidation process in the presence of alkaline potassium permanganate or acidified potassium dichromate

$$\underset{\text{Ethanol}}{CH_3CH_2OH} \xrightarrow[2[O]]{KMnO_4/\ OH^-} \underset{\text{Ethanoic acid}}{CH_3COOH} + H_2O$$

37. Differentiate soaps and detergents.

Soaps	Detergents
It is a sodium salt of fatty acids	It is sodium salts of sulphonic acids
It has poor foaming capacity	It has rich foaming capacity
Biodegradable	Mostly Non - Biodegradable
It forms a scum in hard water	It does not forms a scum in hard water

38. List the uses of ethanol

    i) in medical wipes, as an antiseptic.

    ii) as an anti-freeze in automobile radiators

    iii) as an antiseptic to sterilize wounds in hospitals.

    iv) as a solvent for drugs, oils, fats, perfumes, dyes, etc

39. List the uses of ethanoic acid.

    i) in the manufacture of plastic.

    ii) in making dyes, pigments and paint.

    iii) in printing on fabrics.

iv) as a laboratory reagent.

40. What is a functional group?

A functional group is an atom or group of atoms in a molecule, which gives its characteristic chemical properties.

DETAILED QUESTIONS

1. Give the salient features of "Modern atomic theory".
2. Derive the relationship between Relative molecular mass and Vapour density
3. Calcium carbonate is decomposed on heating in the following reaction

   $CaCO_3 \rightarrow CaO + CO_2$

   i. How many moles of Calcium carbonate are involved in this reaction?

   ii. Calculate the gram molecular mass of calcium carbonate involved in this reaction

   iii. How many moles of CO_2 are there in this equation?
4. Explain smelting process of iron
5. What are the methods of preventing corrosion in metals?
6. Write notes on i) saturated solution ii) unsaturated solution
7. Write notes on various factors affecting solubility.
8. In what way hygroscopic substances differ from deliquescent substances.
9. A solution is prepared by dissolving 45 g of sugar in 180 g of water. Calculate the mass percentage of solute.
10. 3.5 litres of ethanol is present in 15 litres of aqueous solution of ethanol. Calculate volume percent of ethanol solution
11. What are called thermolysis reactions?
12. Explain the types of double displacement reactions with examples.
13. Explain the factors influencing the rate of a reaction
14. How does pH play an important role in everyday life?
15. What is a chemical equilibrium? What are its characteristics?
16. What is called homologous series? Give any three of its characteristics?
17. Arrive at, systematically, the IUPAC name of the compound: $CH_3–CH_2–CH_2–OH$.
18. How is ethanol manufactured from sugarcane?
19. Explain the mechanism of cleansing action of soap.
20. The molecular formula of an alcohol is $C_4H_{10}O$. The locant number of its –OH group is 2.

(i) Draw its structural formula.

(ii) Give its IUPAC name.

(iii) Is it saturated or unsaturated?

NUMERICAL PROBLEMS

1. Calculate the gram molar mass of the following. 1) H_2O 2) CO_2 3) $Ca_3(PO_4)_2$
2. Calculate the number of moles in 46 g of sodium?
3. Calculate the number of moles in 5.6 litre of oxygen at S.T.P
4. Calculate the number of moles of a sample that contains 12.046×10^{23} atoms of iron ?
5. Calculate the mass of 1.51×10^{23} molecules of water
6. Calculate the number of molecules in 11.2 litre of CO_2 at S.T.P
7. Calculate the molar volume of 14 g nitrogen gas.
8. 1.5 g of solute is dissolved in 15 g of water to form a saturated solution at 298K. Find out the solubility of the solute at the temperature
9. A solution was prepared by dissolving 25 g of sugar in 100 g of water. Calculate the mass percentage of solute
10. Calculate the pH of 0.01 M HNO_3?
11. Calculate the pH of 1×10^{-4} molar solution of NaOH
12. The hydroxyl ion concentration of a solution is 1×10^{-9}M. What is the pOH of the solution?

BIOLOGY

BOTANY

UNIT-12

PLANT ANATOMY AND PLANT PHYSIOLOGY

I. CHOOSE THE CORRECT ANSWER

1. Casparian strips are present in the ---------- of the root
   (a) Cortex (b) pith (c) pericycle **(d) Endodermis**
2. The xylem and phloem arranged side –by side on same radius is called
   (a) Radial (b) amphivasal **(c) conjoint** (d) None of these.
3. Which is formed during anaerobic respiration
   (a)carbohydrate **(b) Ethyl acohol** (c) Acetyl COA (d) pyuvate.
4. Krebs cycle takes place in
   (a) Chloroplast **(b) mitochondrial Matrix** (c) stomata (d) inner mito
5. Oxygen is produced at what point during photosynthesis
   (a) when ATP is converted to ADP (b) when CO2 **(c) when H_2O is splitted** d) All of these .

II. FILL IN THE BLANKS

1. xylem and phloem occurring on the same radius constitute a vascular bundle called **conjoint bundle .**
2. Glycolysis takes place in **cytoplasm**
3. The source of O_2 liberated in photosynthesis is **water**
4. **Mitochondria** is the ATP factory of the cells

III. STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE. CORRECT THE STATEMENT IF IT IS FALSE :

1. Phloem tissue is involved in the transport of water in plant. **False.**
   (Corrected Statement : xylem tissue is involed in the transport of water in plants)
2. In monocot stem ,cambium is present in between the xylem and phloem. **False** (Corrected statement: In **dicot** stem cambium is present in between the xylem and phloem)

3. Anaerobic respiration produces more ATP than aerobic respiration .**False**
(Corrected statement : Anaerobic respiration produces **less ATP** then aerobic respiration)

IV. MATCH THE FOLLOWING

Column I		Column II
1. Ambhicribal	-	Dracaena
2. Cambium	-	Translocation of food
3. Amphivasal	-	Fern
4. Xylem	-	Secondary growth
5. Phloem	-	Conduction of Water.

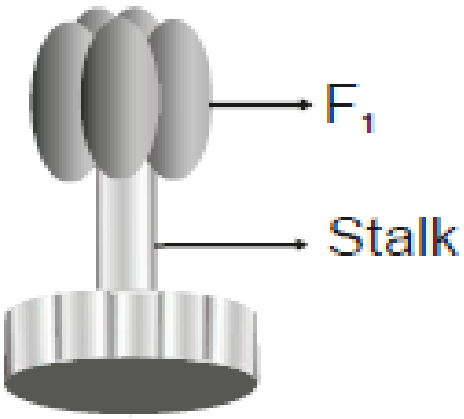
Answer.

1. Fern
2. Secondary growth
3. Dracaena
4. Conduction of water
5. Translocation of food

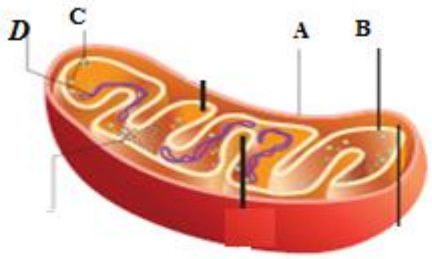
V. SHORT ANSWER QUESTIONS:

1. Write a short note on Mesophyll.
   - In a leaf, the tissue present between the upper and lower epidermis is Called mesophyll.
   - It is differentiated into palisade parenchyma and Spongy parenchyma.

2. Draw and label the structure of Oxysonces



3. Draw and label the diagram of Mitochondria



ANSWERS

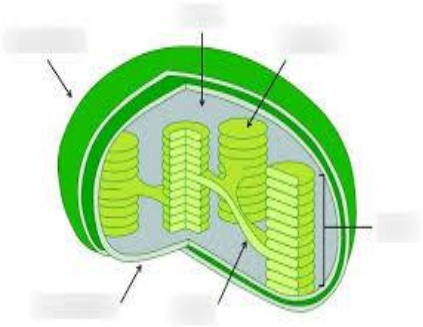
A – Outer Membrane

B – Inner Membrane

C – Particles

D – DNA

4. Draw and label the diagram of chloroplast



ANSWERS

A – Matrix

B – Granum (Thylakoids)

C – Stroma Lamella

D – Inner & Outer mitochondrial membrane

5. What is photosynthesis and where in a cell does it occur?
    - Photosynthesis is a process by Which Autotrophic organisms like green plants, algae and chlorophyll containing bacteria utilize the energy form sunlight to synthesize their own food.
    - It occurs in the chloroplast of the cell

6. Why Should the light dependent reaction occur before the light independent reaction occur before the light in dependent reaction?
    - During light dependent reactions, the photosynthetic pigments absorb the light energy and convert it in to chemical energy ATP and $NADPH_2$
    - During light independent reactions, Co_2 is reduced into carbohydrates with the help of light generates ATP and $NADPH_2$. So light dependent reaction occurs before the light in dependent reaction.
7. Write the chemical reaction for photo synthesis?

$$6CO_2 + 12H_2O \xrightarrow[Chlorophyll]{Light} C_6H_{12}O_6 + 6H_2O + 6O_2$$

8. Define – Bi Collateral Vascular bundle?
    - In this type of bundle the phloem is present on both outer and inner side of xylem Eg: Cucurbita
9. What are the factors affecting photosynthesis?
    - External factors →light ,CO_2,temperature,Water and mineral elements.
    - Internal factors→pigments, leaf age, accumulation of carbohydrates and hormones.
10. What is Respiratory Quotient?

    Respiratory Quotient is also known as R.Q. It is the ratio of volume of carbon dioxide liberated and the volume of oxygen consumed during respiration .

$$RQ=\frac{Volume\ of\ CO_2 liberatel}{volnce\ of\ O_2 consunced}$$

11. Differentiate between Dicot and Monocot leaf

Dicot leaf	**Moncocot leaf**
Dorsiventral leaf	Isobilateral leaf
Mesophyll is differentiated into palisade and spongy paranchyma	Mesophyll is not differentiated into palisade and spongy paranchyma

12. What are the three types of plastids?
    1. Chloroplast - Green coloured plastids
    2. Chromoplast – Yellow, red , orange coloured plastids
    3. Leucoplast – Colourless plastids

VI. LONG ANSWER QUESTIONS:

1. Differentiate the following
    a. Monocot root and Dicot root
    b. Aerobic and Anaerobic respiration
2. Describe and name three stages of cellular respiration that aerobic organisms , use to obtain energy from glucose.
3. How does the light dependent reaction differ from the light independent reaction? What are the end product and reactants in each? Where does each reaction occur within the chloroplast?
4. Explain, different types of vascular bundles with diagram ?
5. Draw the transverse section (T.S) of Dicot root?
6. Draw and label the parts of Dicot leaf (T.S)

UNIT-14

TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS.

I. CHOOSE THE CORRECT ANSWER

1) Active transport involves

a) movement of molecules from lower to higher concentration. b) Expenditure of energy

c) It is an uphill task **d) all of the above**

2) Which of the following process requires energy?

a) active transport b) diffusion c) osmosis d)all of them

3) The wall of human heart is made of

a) Endocardium b) Epicardium c) Myocardium d) All of the above

4) Which is the sequence of correct blood flow

a) ventricle – atrium-vein-arteries b) atrium –ventricle - vein-arteries

c) **atrium –ventricle-arteries-vein** d) ventricles-vein-atrium –arteries

5)"Heart of heart" is called

a) **SA node** b) AV node c) purkinje fibres d) Bundle

6) Which one of the following regarding blood composition is correct:

a) plasma-blood –Lymphocyte b) Serum- blood + Fibrinogin

c) Lymph-plasma + RBC+ WBC **d) Blood-plasma+ RBC+WBC +Platelets**

II. FILL IN THE BLANKS:

1. **Transpiration i**nvolves evaporative loss of water from aerial parts
2. Water enters the root cell through a **semipermeab**le plasma membrane.
3. Normal blood pressure is **120/80mmHg**
4. The normal human heart beat rate is about **72-75** time per minute .

III .MATCH THE FOLLOWING:

SECTION-1

1.	Symplast path way	-	a) Leaf
2.	Transpiration	-	b) plasma desmata
3.	osmosis	-	c) pressure in xylem
4.	Root pressure	-	d)pressure gradient

SECTION -1 ANSWERS

1.	b) plasma desmata
2.	a)Leaf
3.	d) pressure gradient
4.	c)pressure in xylem

SECTION –II

1) Leukemia - a) Thrombocytes
2) Plate lets - b) phagocyte
3) Monocytes - c) Decrease in leucocytes
4) Leucopenia - d) Blood cancer
5) AB blood group - e) Allergic condition
6) O blood group - f) Inflammation
7) Eosinophils - g) Absence of antigen
8) Neutrophils - h) Absence of antibody

SECTION – II ANSWERS

1.	d) blood cancer
2.	a) Thrombocytes
3.	b) phagocyte
4.	c) Decrease in leucocytes
5.	h) Absence of antibody
6.	g) Absence of antigen
7.	e) Allergic condition
8.	j) Inflammation

IV. STATE WHETHER TRUE OR FALSE, IF FALSE WRITE THE CORRECT STATEMENT.

1. The Form of sugar ,transported through the phloem is glucose. **False**
   The Form of sugar transported through the phloem is sucrose.
2. In apoplastic movement the water travels through the cell membrane and enter the cell. **False.**

In apoplastic movement the water travels through the intercellular spaces and walls of the cell

3. When guard of cells lose water. The stoma opens. **False**.
   When guard cells lose water the stoma become **flaccid and closes.**
4. Initiation and stimulation of heart beat take place by nerves. **False**
   Initiation and stimulation of heart beat takes place by **sino atri al node**.
5. WBC defend the body from bacterial and viral Infections. **True**

V. SHORT ANSWER QUESTIONS

1. What causes the opening and closing of guard cells of stomata during transpiration ?
   - The change in turgidity of the guard cells cause the opening and closing of stomata.
   - Gain of water –Turgidity →Turgidity of guard cells→opening of stomata.
   - Lose of water → Guard cells become flaccid →closing of stomata.
2. What is cohesion?
   The Force of attraction between molecules of water is called cohesion.
3. Why is the circulation in man referred to as double circulation?
   - In man it is double circulation because the heart contains completely separated four chambers.
   - Blood circulates twice through the heart in one complete cycle
   - The oxygenated blood do not mix with the deoxygenated blood.
4. What are heart sounds? How are they produced?
   - The rhythmic closure and opening of the valves cause the sound of the heart
   - The "Lubb" sound is produced by the closure of tri and bicuspid valves. (longer duration).
   - The "Dubb" sound is produced by the closure of semilunar values (shorter duration).
5. What is the importance of values in the heart?
   - They regulate the Flow of blood
   - Allow blood in a single direction
   - They prevent back flow of blood
6. Who discovered RH factor ?why was it named so?
   - RH factor was discovered by Land steiner and wiener in 1940.
   - As it was discovered from Rhesus monkey it is named as Rhesus factor or Rh factor.
7. How are arteries and veins structurally different from one another?

	Artery	Vein
1.	Distributing vessels	Collecting vessels
2.	Deep location	Superficial in location
3.	Blood flow with high pressure	Blood flow with low pressure
4.	Wall of artery is strong, thick and elastic.	Wall of vein is weak thin and non-elastic
5.	All arteries carry oxygenated blood except pulmonary arteries.	All viens carry deoxygenated blood except pulmonary viens

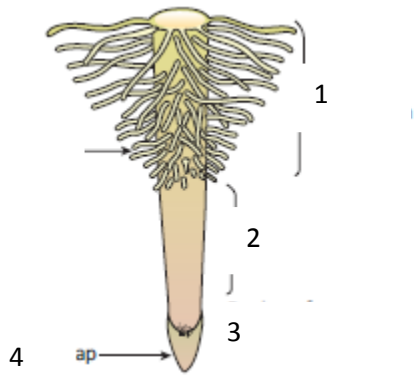
8. Why is the sino-atrial node called the pace maker of heart?

Sino atrial node is called as the pace maker of heart because it is capable of initiating impulse which can stimulate the heart muscle to contract.

9. Differentiate between systemic circulation and pulmonary circulation?

	Systemic circulation	**Pulmonary cirulation**
1.	It starts from left ventricle and circulates oxygenated blood to various part of the body	It starts from the right ventricle to lungs with de oxygenated blood.
2.	Ends in a right atrium with deoxygenated blood.	Ends in a left atrium with oxygenated blood
3.	Aorta carries oxygenated blood to all the organs of body except pulmonary artery.	Vein collects deoxygenated blood from all the organs of body except pulmonary vein

10. Draw the structure of Root Tip with Root Hair's and label the parts



11. List out the factors affecting transpiration?

- External factors: Temperature, light, Humidity, and wind speed.

- Internal factors: Number and distribution of stomata, percentage of open stomata, water stress etc.

12. What is role of haemoglobin in the blood circulation?
    - It gives red colour to the blood .
    - It is the respiratory pigments.
13. What is meant by open type of blood circulation?
    - In this type, the blood is pumped by heart into blood vessels.
    - That opens in to blood spaces called sinuses.
    - Capillary system is absent.
14. What is meant by closed type of blood circulation?
    - The blood flows in a complete circuit around the body through specific blood vessels called arteries.
15. What are the clinical significance of sphygmomanometer?
    - It helps to estimate the state of blood circulation and working of the heart.
    - It helps to diagnose high and low blood pressure.
16. Diffusion and osmosis.
    - Diffusion: The movement of molecules in liquids and solids from a region of higher concentration to a region of lower concentration.
    - The movement of solvent or water molecules from the region of higher concentration to a region of lower concentration through a semipermeable membrane.
17. Cohesion and Adhesion.
    - Cohesion : The force of attraction between molecules of water.
    - Adhesion : The force of attraction between molecules of different substances. Eg: The attraction between xylem and water molecules.
18. Lymphocytes from Monocytes?
    - Lymphocytes:-
        1. Smaller in size
        2. Constitute about 20-25% of leucocytes
        3. Produce antibodies
    - Monocytes:-
        1. Larger
        2. Constitute about 5-6% of total leucocytes
        3. phagocyte and engulf bacteria.

VI. LONG ANSWER QUESTIONS:-

1. How do plants absorb water ?Explain
2. What is Transpiration ? Give the importance of transpiration?
3. Why are leucocytes classified as granulocytes and agranulocytes ? Name each cell and mention its function.
4. Differentiate between systole and diastole. Explain the conduction of heart beat.
5. Enumerate the functions of blood/
6. Describe the structure and working of the human heart.

CHAPTER - 16

PLANT AND ANIMAL HARMONES.

I. CHOOSE THE CORRECT ANSWER:-

1. Gibberellines cause
   a) Shortening of genetically tall plants b) **Elongation of dwarf plans .**
   c) promotion of rooting d)yellowing of young leaves.
2. Which one of the following harmone is naturally not found in plants?
   a)2,4-D b) GA_3 C) Gibberellins d)IAA.
3. Avena coleoptiles test was conducted by ?
   a)Drawin b) N.smit c) paal **d) F.W Went**
4. To increase the sugar production in sugarcanes they are sprayed with?
   a) Auxin b) cytokinin c)Gibberellins d) **Ethlyene.**
5. Identity the exocrine gland?
   a) Pituitary gland b) Adrenal Gland c) **Salivery gland** d)Thyroid Gland
6. Which organ acts as both Exocrine gland as well as Endocrine gland
   a) **Pancreas** b)kidney c) liver d)Lungs
7. Which one is referred as "Master Gland"?
   a)Pineal gland b) **pituitary gland** c) Thyroid gland d)Adrenal gland

II. FILL UPS:-

1. **Auxin** causes will elongation ,apical dominance and prevents abscission.
2. **Ethylene** is a gaseous hormone involved in formation of abscission zone in leaves, fruits and flowers promotes fruit ripening.
3. **Abcisic acid** causes stomatal closure.
4. Calcium metabolism of the body is controlled by **Parathormone.**
5. In the islets of Langerhans, beta cells secrete **Insulin.**
6. Decreased secreation of thyroid hormones in the children lead to **cretinism.**

III. MATCH

Column I	Column II	Column III
Auxin	Gibberella fuji kuroi	Abscission
Ethylene	Coconut milk	Internodal elongation

Abscisi acid	Caleoptile tip	Apical dominance
Cytokinin	chloroplast	Ripening
Gibberellins	Fruits	Cell division

Answer:-

Column I	Column II	Column III
Auxin	Caleoptile tip	Apical dominance
Ethylene	Fruits	Ripening
Abscisi acid	Chloroplast	Abscission
Cytokinin	Coconut milk	Cell division
Gibberellins	Gibberella fuji kuroi	Internodal elongation

MATCH:-

b)

Hormones	Disorders
Thyroxine	Acromegaly
Insulin	Tetany
Parathormone	Simple goitre
Growth hormone	Diabetes insipidus
ADH	Diabetes mellitus

ANSWERS:

Hormones	Answers
Thyroxine	Simple goitre
Insulin	Diabetes mellitus
Parathormone	Tetany
Growth hormone	Acromegaly
ADH	Diabetes insipidus

IV. State Whether True or False , If False write the correct answer:-

1. A plant hormone concerned with stimulation of cell division and promotion of nutrient mobilization is cytokinin. **True**

2. Gibberellins cause Par the no carpy in to mato. **True**
3. Ethylene retards senescence of leaves, flowers and Frutits. **False**
   Answer: It stimulates the senescence of Leaves, flowers and fruits.
4. Exopthalmic goitre is due to the over secretion of thyroxine. **True.**
5. Estrogen is secreted by corpus Luteum. **False**
   Answer: Estrogen is produced by the Graffian Follicles of ovary.

V. SHORT ANSWER QUESTION:-

1.What are synthethic auxins? Give Examples?

Artificially synthesized auxins that have the properties of natural auxins are known as synthetic auxins.

Egs:- i) NAA-Naphthalene acetic Acid

ii) 2.4. D-2.4 Dichlorophenoxy –Acetic acid

2. What is bolting? How can it be induced artificially?

- Sudden shoot elongation followed by flowering is known as bolting.
- Artificially bolting can be induced on rosette plants by the treatment of Gibberellins.

3. What are chemical messengers?

The endocrine system act through chemical messengers known as hormones produced by endocrine Glands.

4. Write the differences between Endocrine and Exocrine Gland.?

EXOCRINE GLANDS	ENDOCRINE GLANDS
These glands have ducts	They are ductless gland
Their secretion is carried through duct.	Their secretion is carried through blood.
Eg. Salivary Gland .	Eg:- Pituitary Gland

5. Why are thyroid hormones referred as personality hormones ?

- Thyroid hormone is essential for normal physical, mental and personality development. Hence it is called as personality hormone.

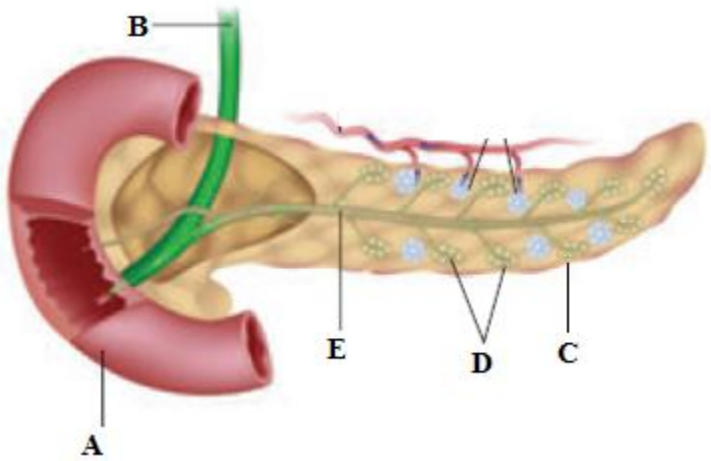
6. What is called Richmond Lang effect?

Application of cytokinins delays the process of aging or senescence in plants. This is called Richmond lang effect.

7. Why do we consider ABA as stress hormone ?

When a plant is Exposed to stress condition such AS water scarcity ,saline soil, cold, and frost condition ABA is produced. So ABA is considered as stress hormone .

8. What are the symptoms of cretinism?
    1. Stunted growth
    2. Mental defect
    3. Lack of skeletal development.
9. What is meant by tetany?
    - It refers to sustained contraction of muscles in face, Larynx, hand ,and feet due to the calcium deficiency.
10. Draw the given diagram and mark the following past A,B,C,D and E.



ANSWER

A- Duodenum
B- Bile duet
C- Pancreas
D- Acinar cells
E- pancreatic duct.

IV Long answer:

1. a) Name the gaseous plant hormone .Describe its three different action in plants.
   b) Which hormone is known as stress hormone in plants? Why?
2. Write the physiological effects of gibberellins.
3. Write down the physiological effects of Auxins.
4. List down the physiological effects of ABA.
5. Give an amount by hypothyroidism?
6. What is the significance of insulin? And What does the deficiency lead to? Describe?

UNIT- 17

REPRODUCTION IN PLANTS AND ANIMALS

I. CHOOSE THE CORRECT ANSWER

1. The plant which propagates with the help of its leaves is----------
   a)onion b) Neem c) Ginger **d) Bryophyllum**
2. Asexual reproduction takes place through budding in----------
   a)Amoeba **b)yeast** c)plasmodium d)Bacteria
3. Syngany results in the formation of----------
   a)Zoospores b)conidia **c)Zygote** d) chlamydospores
4. Anemophilous flowers have----------
   a)sessile stigma b) small smooth stigma c)colored flower **d) large feathery stigma**
5. A single highly coiled tube where sperms are stored , get concentrated and mature is known as----------
   a) Epididymis b) vasa efferentia c)Vasdeferens d) seminiferous tubules
6. The large elongated cells that provide nutrition to developing sperms are----------
   a) primary germ cells **b)Sertoli cells** c) sermatogonia d) Spermatogonia
7. Estrogen is secreted by----------
   a) Anterior pituitary b) primary follicle **c) Graffian follicle** d) Corpus tutem

II. FILL IN THE BLANKS:

1. The embryo sac in a typical dicot at the time of fertilization is **7 celled and eighth nuclei**
2. After fertilization the ovary develops into **Fruit**
3. Planaria reproduces asexually by **Regeneration**
4. **Colostrum** is the first secretion form the mammary gland after child birth.
5. Prolactin is a hormone produced by **Anterior pituitary**

III. MATCH THE FOLLOWING:

Column 1		Column 2
1. Fission	-	Spirogyra
2. Budding	-	Amoeba
3. Fragmentation	-	Yeast

ANSWER:

Column 1		Answer
1. Fission	-	1.Amoeba
2. Budding	-	2.Yeast
3. Fragmentation	-	3.Spirogya

IV. STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE . CORRECT THE FALSE STATEMENT

1. Seeds are the product of Asexual reproduction. **False**
   (corrected statement: Seeds are the product of **sexual** reproduction.)
2. Stalk of the ovule is called pedicle. **False**
   (corrected statement: Stalk of the ovule is called **funiculus.**)
3. Yeast reproduces asexually by means of multiple fission . **False**
   (Correct statement: Yeast reproduces **vegetatively** by means of multiple fission)
4. The part of the pistil which serves as a receptive structure for the pollen is called as style. **False**
   (Correct statement: The part of the pistil which serves as a receptive structure for pollen is called as **stigma**)
5. Insect pollinated flowers are characterized by dry and smooth pollen? **False**
   (Correct statement: **Wind** pollinated flowers are characterized by dry and smooth pollen)
6. Sex organs produce gametes which are diploid. **False**
   (Correct statement: sex organs produce gametes which are **haploid)**

VI. SHORT ANSWER QUESTIONS

1.How does binary fission differ from multiple fission?

S.No	Binary Fission	Multiple Fission
1.	In binary fission, the parent organisms splits to form two new organisms	In multiple fission the parents organism at the splits to form many new organism at the same time.
2.	It takes place during favourable environmental conditions	It takes place during unfavourable environmental conditions
3.	It takes place in organisms like Amoeba, paremecium etc.	It take palce in organism like plasmodium

2. Define triple fusion?
    - Among the two male gamete produced by generative calls, one fuses with egg
    - The other sperm fuses with the secondary nucleus forming an endosperm is called triple fusion.
3. Write the characteristics of insect pollinate flowers?
    - To attract insect these flowers are brightly coloured, have smell and nectar
4. Name the secondary sex organs in male ?
    - Vas deferens ,epididymis ,seminal vesicle, prostate gland and penis.
5. What is colostrum? How is milk production hormonally regulated.?
    - The milk produced form the breast during the 2 to3 days after child birth is called colostrums
    - Milk production from alveoli of mammary glands is stimulated by prolactin secreted from the anterior pituitary
    - The ejection of milk is stimulated by posterior pituitary hormone oxytocin.
6. Identify the part A,B, C and D

A – Exine
B – Intine
C – Generative Cell
D – Vegetative Cell

7.Mention the advantages and the disadvantages of self and Cross pollination?

SELF – POLLINATION	CROSS - POLLINATION
ADVANTAGES • Flowers do not depend on agents for pollination • There is no wastage pollen grains **DISADVANTAGES** • The seeds are less in numbers • The endosperm is minute. Therefore the seeds produce weak plants. • New varieties of plants cannot be produced.	**ADVANTAGES** • It leads to the production of new varieties. • More viable seeds are produced **DISADVANTAGES** • Pollination may fail due to distance barrier. • More waste of pollen grains. • It many introduce some unwanted characters. • Flowers depend on the external agencies for pollination.

VII. LONG ANSWER QUESTIONS

1. With a neat labeled diagram describe the parts of a typical angiosperm ovule.
2. Explain the structure of testes.
3. Explain the structure of ovary.

UNIT – 18

HEREDITY

I. CHOOSE THE CORRECT ANSWER

1. According to mendel alleles have the following character

a) pair of genes **b) Responsible for character** c) Production of gametes d) Recessive factors

2. 9: 3 : 3 : 1 ratio is due to

a) segregation b) Crossing over **c) Independent assortment** d) Recessiveness

3. The units form the backbone of the DNA

a) 5 carbon sugar b) Phosphate c) Nitrogenous bases **d) Sugar phosphate**

4. Okasaki fragments are joined in human beings are

a) Helicase b) DNA polymerase c) RNA primer **d) DNA ligase**

5. The number of chromosomes found human beings are called

a) 22 pairs of autosomes and 1 pair of allosomes b) 22 autosomes and 1 allosome

c) 46 autosomes d) 46 pairs of autosomes and 1 pair of allosomes

6. The loss of one or more chromosomes in a ploidy is called.

a) Tetraploidy **b) Aneuploidy** c) Euploidy d) Polyploidy

II. FILL IN THE BLANKS

1. The pair of contrasting character (traits) of mendel are called _____**Alleles**
2. Physical expression of a gene is called _____ **Phenotype**
3. The thin thread like structures found in the nucleus of each cell are called _____ **Chromosomes.**
4. DNA consists of two_____chains. **Polynucleotide**
5. An inheritable change in the amount or the structure of the gene or a chromosomes is called _____ **mutation.**

III. IDENTIFY WHETHER THE STATEMENTS ARE TRUE OR FALSE. CORRECT THE FALSE STATEMENT

1. A typical mendelian dihybrid ratio of F2 generation is 3 : 1. **False**

   Correct Statement : A typical mendelian dihybrid ratio of F2 generation is 9 : 3 : 3 :1

2. Each gamete has only has only one allele of a gene. **True**
3. Some of the chromosomes have an elongated knob – like appendages known as telomere. **False**

   Some of the chromosomes have an elongated knob –like appendages known as **Satellite**

4. New nucleotides are added and new complementary strand of DNA is formed with the help of enzyme DNA polymerase. **True**

5. Down's syndrome is the genetic condition with 45 chromosomes. **False**

   Down's syndrome is the genetic condition with **47** chromosomes.

IV. MATCH THE FOLLOWING

I	II
1. Autosomes	a. Trisomy 21
2. Diploid Condition	b. 9: 3 : 3 : 1
3. Allosome	c. 22 pair of chromosome
4. Down Syndrome	d. 2n
5. Dihybrid ratio	e. 23^{rd} pair of chromosome

ANSWER

I	ANSWERS`
1. Autosomes	c. 22 Pair of chromosome
4. Diploid Condition	d. 2n
5. Allosome	e. 23^{rd} pair of chromosome
4. Down Syndrome	a. Trisomy 21
5. Dihybrid ratio	b. 9: 3 : 3 : 1

V. SHORT ANSWER QUESTIONS

1. Why did mendel select pea plant for his experiments?
   - It is naturally self pollinating so easy to raise pure breeding plants.
   - The flowers are bisexual
   - It has short life span (Annual plant) so several generations can be followed.
   - Easy to cross pollinate.
   - Has well defined contrasting character.
2. What do you understand by the term phenotype and Genotype?

PHENOTYPE	GENOTYPE
External expression of a particular character. Eg. Tall	Genetic expression of an organism's particular character. Eg. TT or tt is the genetic nature of tallness

3. What are allosomes?
   - Sex chromosomes or Hetrosomes are also known as allosome.

- Responsible for determining sex of an individual.
- There are two types of sex chromosomes X and Y.

4. What are okazaki fragments?

The short segments of DNA synthesized in the lagging strand is known as okazaki fragments, and are joined together by the enzeme DNA Ligase.

5. A pure tall plant (TT) is crossed with pure dwarf plant(tt) what would be the F_1 and F_2 generations. Explains?

Parent - Sex — Tall x Dwarf

Parent - Phenotype — (T) (t)

- Genotype
- Gametes

Tt (All ar Tall).

F_1 – Generation Genotype

Phenotype

F_1 is selfed gametes

Tt x Tt

(T) (t) x (T) (t)

TT Tt Tt tt

F_2 – Generation Genotype — TT Tt tt TT

Phenotype — Tall Tall Dwarf Tall

F_2 Punnet Square

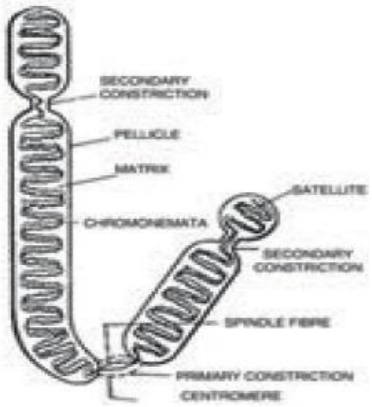
	T	t
T	TT (Tall)	Tt(Tall)
t	Tt(Tall)	tt(Dwarf)

F_2 Phenotype Ratio **Tall : Dwarf** **3 : 1**

F_2 Genotype Ratio

Tall	**Tall**	**Dwarf**
(Homozygous)	(Heterozygous)	(Homozygous)
1	**2**	**1**

6. Explain the structure of a chromosome?



- Chromosomes are thin long thread like structure. Two identical structures in a chromosomes are known as sister chromatids.
- Sister chromtids are held together by centromere.
- Chromatids is made up chromonema
- The number of beadlike structure along its length are called chromomeres.
- Chromomeres are made up of
  - DNA, RNA
  - Chromosomal Proteins(Histone and Non Histone)
  - Certain Metallic ions

PRIMARY CONSTRICTION (CENTROMERE)

- The point at which 2 chromosomal arms meet.
- During cell division – spindle fibres attach to the chromosome here,

SECONDARY CONSTRICTION

- Some chromosomes have it at any point of the chromosomes
- The secondary constriction from which nucleous arises is known as nucleolar organizer

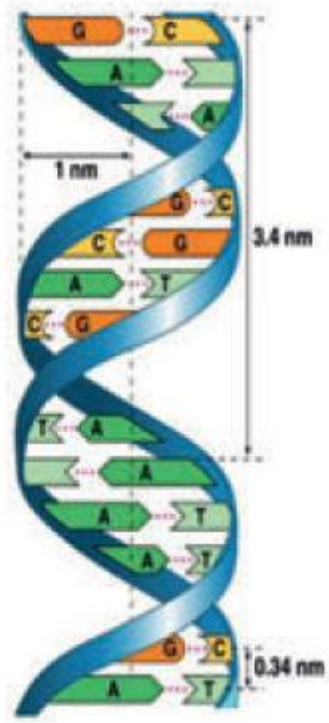
TELOMERE

- It is the end of chromosome.
- It provides stability to the chromosomes.

SATELLITE

- It is a knob like appendage at one end chromosomes with satellites are called as satellite chromosomes.

7. Label the parts of the DNA in the diagram given below ? Explain the structure briefly?

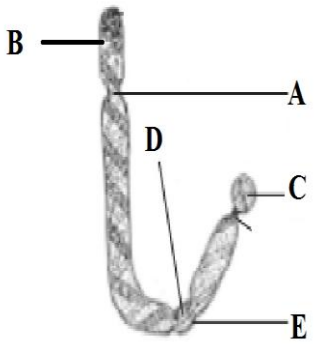


1. A – Guanine ≡ Cytosine
   (Nitrogen Base)
2. B – Sugar – Deoxyribose
3. C – Phosphate
4. D – Adenine = Thyamine
   (Nitrogen Base)

- DNA molecule – consists to two polynucleotide chains and forms a double helix structure, run anti - parallel to one another.
- (Nucleoside = Nitrogen base + Sugar, Nucleotide = Nucleoside + Phosphate)
- Nitrogenous bases in the centre are linked to sugar – phosphate units which form the backbone of the DNA.
- There are two types nitrogeneous bases in DNA they are 1. Purine (A = adenine, G = Guanine) and 2. Pyrimidine (T = Thymine, C= cytosine)
- Pairing on nitrogeneous basis is very specific always between purine and pyrimidine.

1. Adenine and Thymine with two hydrogen bonds (A = T)
2. The given diagram is the structure of Chromosome? Name the parts. (G ≡ C)
3. Each turn of the double helix is 34 A° (3.4nm). There are ten base pairs in a complete turn.

8. The given diagram is the structure of chromosome? Name the parts.



A – Sec. Constriction

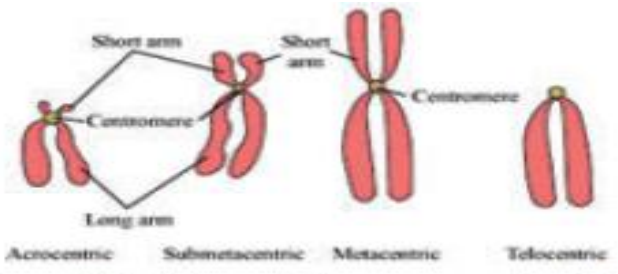
B – Chromonemate

C – Satellite

D – Kinetochore

E - Centromere

9. Draw the 4 types of chromosomes based on the position of centromere and add a sentence describe each.



1	Acrocentric	Rod – shaped – centromere at one and a short and long arm
2	Submeta centric	Centromere near the centre two unequal arms
3	Metacentric	Centromere on the centre of the chromosome form two equal arms and v shaped
4	Telocentric	Centromere on the proximal and rod shaped

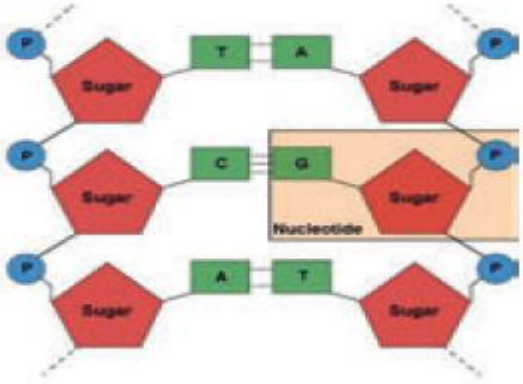
10. Distinguish between Homogametic and Heterogametic Condition?

HOMOGAMETIC	**HETROGAMETIC**
Human female has 22 pairs of autosomes and 1 pair of sex chromosomes (XX)	Human male has 22 pairs of autosomes and 1 pair of sex chromosomes (XY)
The gametes are similar (22 + X) & (22 + X)	The gametes are dissimilar or 2 types (22 + X) & (22 + Y)

11. Differentiate between the results of mono and Dihybrid crosses?

Offspring	**Monohybrid Cross only 2 types**	**Dihybrid Cross 4 types**
F_2 Ratio	3 : 1 Tall Dwarf	9 : 3 : 3 : 1 9 – with two dominant traits 3 – with one dominant and one recessive traits 3 – another dominant and another recessive traits 1 – recessive traits

12. Identify the parts(A,T,G,C,P) in the diagram given below.



A – Adinine

T – Thyamine

G – Guanine

C – Cytocine

P – Phosphoric Acid

VI. LONG ANSWER QUESTION

1. Explain with an example the inheritance of dihybrid cross. How is it different from monohybrid cross?
2. How is the structure of DNA organized? What is the biological significance of DNA?
3. Explain different types of mutation?
4. Explain process of DNA Replication?

ZOOLOGY

2 MARKS

1. Match the Following

Organs	Membranous Covering	Location
1. Brain	Pleura	Abdominal Cavity
2. Kidney	Capsule	Mediastinum
3. Heart	Meninges	Enclosed in thoracic Cavity
4. Lungs	Pericardium	Cranial Cavity

Answer:

Organs	Membranous Covering	Location
1. Brain	Meninges	Cranial Cavity
2. Kidney	Capsule	Abdominal Cavity
3. Heart	Pericardium	Mediastinum
4. Lungs	Pleura	Enclosed in thoracic Cavity

2. Write the dental formula of rabbit.

Answer: Dental Formula is = $I\frac{2}{1}$, $C\ \frac{0}{0}$, $PM\ \frac{3}{2}$, $M\frac{3}{3}$ in rabbit.

It is written as $\frac{2033}{1023}$

3. How is disastema formed in rabbit?

Answer : i) Due to the absence of canines, a gap is formed

ii) The gap inbetween the incisors and premolar is called diastema.

4. Why is the teeth of rabbit called heterodont?
   1. In rabbit the teeth are of different types.
   2. Hence the dentition is called Heterodont.

5. How does leech suck blood from the post?
   1. The leech makes 'Y' shaped incision in the skin of the host by the jaws protruded through its mouth.
   2. The blood is sucked by muscular pharynx and the salivary secretion hirudin is poured.

6. Match the following

COLUMN I	COLUMN II
1. Nissil's granules	Forebrain
2. Hypothalamus	Peripheral Nervous system
3. Cerebellum	Cyton
4. Schwann cell	Hindbrain

Answer:

COLUMN I	COLUMN II
1. Nissil's granules	Cyton
2. Hypothalamus	Forebrain
3. Cerebellum	Hindbrain
4. Schwann cell	Peripheral Nervous

7. Name the parts of the hind brain.

   Answer: i) Cerebellum

   ii) Pons

   iii) Medulla Oblongata

8. What are the structures involved in the protection of brain?

   Answer: i) Cranium

   ii) Meninges - Duramater

   Arachnoid membrane

   Piamater

9. Define reflex arc.

   Answer:

   The pathway taken by the Nerve impulse to accomplish reflex action is called reflex arc.

10. Differentiate between voluntary and involuntary actions.

    Answer:

VOLUNTARY ACTIONS	INVOLUNTARY ACTIONS
1. Voluntary actions are initiated by our own conscious	1. A reflex action is not under the control of our conscious.
2. Its Under the control of brain.	2. Under the control of spinal cord

11. State true or false? Correct the false statement

    The use and disuse theory of organs was postulated by Charles Darwin.

    Answer : False

    Corrected Statement : The use and disuse theory organs was postulated by **Jean Baptist Lamarck**

12. Fill in the blanks

    i) Organism which is considered to be the fossil bird _____

    ii) The study of fossils is called as _____

Answer : False i) Archaeopteryx ii) Paleontology

13. Why is Archeopteryx considered to a connecting link?

Answer : i) Archaeopteryx had wings with feathers like a bird

iii) It had a long tail, clawed digits and conical teeth like a reptile.

So Archaeopteryx is considered to be a connecting link between reptiles and bird.

14. Fill in the blanks

(i) A protein rich wheat variety is _____

(ii) The chemical used for doubling the chromosomes is _____

Answer : (i) Atlas 66 (ii) Calchicine

15. Fill in the Blanks

(i) A rice variety produced by mutation breeding that grows well in saline soil is _____

(ii) Undifferentiated mass of cells _____

Answer : (i) Atomita 2 rice (ii) Stem cells

16. State whether true or false. If false write the correct statement

(i) Golden rice is a hybrid

(ii) Molecular scissors refers to DNA ligases.

Answer : (i) False : Golden rice is a genetically modified crop

(ii) False : Molecular scissors refers to restriction enzymes.

17. Answer the following

(i) Give the name of wheat variety having higher dietary fibre and protein.

(ii) Name the types of stem cells.

Answer : (i) Triticale(6n)

(ii) a. Embroynic Stem Cells

b. Adult (or) Somatic stem cells

18. Name two maize hybrids rich in amino acid lysine

Answer : (i) Protina (ii) Shakti

19. Define genetic Engineering?

Genetic Engineering is the manipulation and transfer of geners from one organism to another organisms to create a new DNA called as remcombinant DNA (rDNA)

20. Distinguish between somatic gene therapy and germline gene therapy.

Somatic Gene Therapy	Germ Line Gene Therapy
It is the replacement of defective gene in somatic cells	It is the replacement of defective gene in germ cell.

21. State the applications of DNA finger printing technique.

- Used in forensic applications to identify the culprit
- Used for paternity testing in case of dispute.

22. What is metastasis?

- The cancerous cells migrate to distant parts of the body and affect new tissues.
- This process is called metastasis.

23. Analogy type Questions. Identify the first words and their relationship and suggest a suitable word for the blank.

(i) Communicable : AIDS
Non Communicable : _____

(ii) Hypertension : Hypercholesterolomia
Glycosuria : _____

Answer : (i) Cancer
(ii) Hyperglycemia

24. State whether True or False, if false write the correct statement

(i) AIDS is an epidemic disease.

(ii) Type 2 diabetes mellitus results due to insulin deficiency

Answer : (i) False : AIDS is a pandemic disease.
(ii) False : Type 1 diabetes mellitus results due to insulin deficiency.

25. Mention the diseases caused by tobacco smoke

Answer : (i) Lungs and oral cancer
(ii) Bronchitis
(iii) TB
(iv) Heart diseases

26. i) A highly poisonous chemicals derived from tobacco is _____
ii) Blood cancer is called _____

Answer : (i) Nicotine
(ii) Leukaemia

27. What are the contributing factors for obesity?

Answer : (i) Genetic Factors (ii) Physical inactivity
(iii) Over eating (iv) Endocrine Factors

28. State whether True or False. If false correct

(i) Biogas is a fossil fuel.

(ii) Nuclear energy is a renewable energy

Answer : (i) False : Petroleum is a fossil fuel.

(ii) False : Nuclear energy is a non renewable energy

29. What are the agents of soil erosion?

(i) High velocity of wind

(ii) Air currents

(iii) Flowing water

(iv) Landslide

(v) Deforestation, Farming and mining.

30. Why fossil fuels are to be conserved?

- Formation of fossil fuels is a very slow process.
- Takes very long period of time for renewal.

31. Solar energy is a renewable energy. How?

- The sun gives out very large amount of light and heat energy
- Available in unlimited amount and can be renewed over a short period of time.

32. What is the importance of rainwater harvesting?

- Increases ground water levels.
- Meets the increased demand of water.
- Reduces flood and soil erosion
- Used as drinking water.

33. What are the consequences of deforestation?

- Floods
- Drought
- Soil Erosion
- Loss of wild life
- Desertification

34. Incineration

- Burning of medical wastes in properly constructed furnace at high temperature.

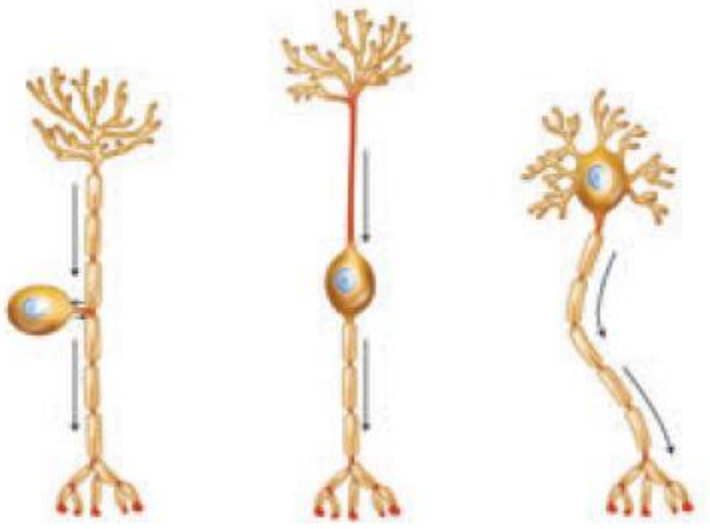
35. What is SCRATCH?

- Scratch is a software used to create animations, cartoons and games easily.
- It is visual programming language.

4 MARKS

1. **List out the parasitic adaptations in leech.**
   (i) Blood is sucked by pharynz
   (ii) Blood is stored in the crop
   (iii) The Three jaws inside the mouth, causes a painless Y-shaped wound in the skin of the host.
   (iv) The salivary glands produce hirudin which does not allow the blood to coagulate.
   (v) Parapodia and setae are absent.
2. **How does locomotion takes place in leech?**
   Locomotion in leech takes place by
   1) L*ooping or crawling movement.*
   - This type of locomotion is brought about by the contraction and relaxation of muscles.
   - The two suckers serve for attachment during movement on a substratum.

   2) Swimming movement
   - Leeches swim very actively and perform undulating movement.
3. **Classify neurons based on the structure.**



(1) (2) (3)

1) **UNIPOLAR NEURONS**

- Only one nerve process arises from the cyton which acts both axon and dendron.
- Found in early embryos

2) **BIPOLAR NEURONS**

- The cyton gives rise to two nerve processes of which one acts as an axon while another as a Dendron.
- Found in retina.

3) **MULTIPOLAR NEURONS**

- The cyton gives rise to many dendrons and an axon.
- Found in cerebral cortex of brain.

4. **Our body contains a large number of cells 'L' which are the longest cells in the body. 'L' has long and short branch called as 'M' and 'N' respectively. There is a gap 'O' between two 'L' cells, through which nerve impulse transfer by release of chemical substance 'P'.**

(1) Name the cells L

(2) What are 'M' and 'N'?

(3) What is the gap 'O'?

(4) Name the chemical substance P

(1) Neuron

(2) M – Axon

N - Dentrites

(3) Synapse - O

(4) Neurotransmitters – Acetyl choline - P

5. **(i) Differentiate between medullated and non - medullated nerve fibre**

(ii) Which acts as a link between the nervous system and endocrine system.

i)

MEDULLATED NERVES	NON – MEDULLATED NERVES
i) The axon is covered with myelin sheath	The axon is not covered with myelin sheath
ii) This forms the white matter of our brain	This forms the grey matter of our brain

ii) Hypothalamus

6. Define Ethanobotany and write its importance.

Ethanobotany : The study of a region's plants and their practical uses through the traditional knowledge of the local culture of people.

Importance :

i. It provides traditional uses of plants.

ii. Tribal communities utilize ethnomedicinal plants.

iii. This ethno medicinal data will serve as a useful source of information in medicine.

7. How do you differentiate homologous organs from analogous organs?

HOMOLOGOUS ORGANS	ANALOGOUS ORGANS
i) Their mode of development and basic structure of bone are similar.	Their mode of development and basic structure are different.
ii) They look dissimilar	They look similar
iii) They adapted for different function.	They perform similar function.
iv) They have inherited from common ancestors whose embryo development pattern is similar	They have inherited from different ancestors whose embryo development pattern is dissimilar
v) Ex: Fore Limbs of Mammals	Ex: The wings of a bat, birds, insects

8. What is heterosis? What are the effects of hybrid vigour in animals?

HETEROSIS : The superiority of the hybrid obtained by cross breeding is called as heterosis or hybrid vigour.

Effects

- Increased production of milk by cattle
- Increased production of egg by poultry
- High quality of meat is produced.
- Increased growth rate in domesticated animals.

9. i) Distinguish between somatic gene therapy and germ line gene therapy

ii) State the applications of DNA finger printing technique.

SOMATIC GENE THERAPY	GERMLINE GENE THERAPY
i) Replacement of defective gene in somatic cells	Replacement of defective gene in germ cell.
ii) Corrected gene may not be carried to the next generation.	Corrected gene will be carried to the next generation

ii) Applications of DNA finger printing technique

- Used in forensic department to identify the culprit.
- Used for paternity testing in case of disputes.

10. Differentiate between Type – 1 and Type – 2 Diabetes Mellitus

FACTORS	TYPE - 1	TYPE - 2
Prevalence	10 - 20 %	80 – 90%
Age of Onset	Javenile Onset	Maturity onset (>30yrs)
Body Weight	Normal or under weight	Obese
Defect	Insulin deficiency due to destruction of β-Cells	Target cells do not respond to insulin
Treatment	Insulin administration is necessary	Can be controlled by diet, exercise and medicine

11. What are the various routes by which transmission of Human immuno deficiency virus takes place?

(i) Sexual contact with infected person

(ii) Use of contaminated needles

(iii) Transfusion of infected blood and blood products

(iv) From infected mother to her child through placenta

12. What precautions can be taken for preventing heart diseases?

(i) Reduction in the intake of calories, low saturated fat, cholesterol rich food low carbohydrates and common salt.

(ii) Increase in the intake of fiber diet, fruits and vegetables, protein, minerals and vitamin.

(iii) Regular exercise, walking and yoga

(iv) Avoid Alcohol consumption and smoking.

13. What are the consequences of deforestation?

(i) Floods (ii) Drought (iii) Soil Erosion (iv) Loss of Wild life

(v) Extinction of species (vi) Imbalance of biogeochemical cycles

(vii) Alteration of climatic conditions (viii) Desertification

14. How are Solid Waste Managed?

(i) Segregation

Biodegradable and non-biodegradable wastes are separated

(ii) Sanitary landfill

Dumped in low lying areas stabilized in 2 – 12 months to become decomposed.

(iii) Incineration

Burning of medical wastes in properly constructed furnace at high temperature

(iv) Composting

Earthworms or microbes are involved in converting the waste into humus

7 MARKS

1. Explain the male reproductive system of rabbit with a labeled diagram
2. With a neat labeled diagram explain the structure of a neuron
3. Illustrate the structure and functions of brain.
4. How does fossilization occur in plants.
5. With a neat labeled diagram explain the techniques involved in gene cloning.
6. Suggest measures to overcome the problems of an alcoholic.
7. How does rainwater harvesting structures recharge ground water.