

ASSISTANT BOOK

QUESTIONS AND ANSWERS FORM 3 AND 4

AL-JAZEERA SECONDARY SCHOOL

REPUBLIC OF SOMALILAD

PHYSICS

SET BY | GROUP OF READING AND ENCOURAGEMENT

14

ACKNOWLEDGEMENT

First of all thanks to Allah for allowing us to complete this booklet with questions and answers in Form 3 and 4 in high school.

*Next up is a special thanks to the owner of **Al-Jazeera Secondary School, Mr. Khadar haji Yusuf**, and the school's management and esteemed teachers for their excellent efforts to prepare students for this booklet, which is a great complement to every student. Who hopes to pass the exam successfully.*

*I also commend the remarkable efforts of the students who worked on the writing of this book, which has been internationally researched and committed to the completion of this book, first by **Zakariye Ahmed Aden** and several other students who participated in the same study. editing this booklet.*

INTRODUCTION

When we saw the importance of having students find a book of questions and answers that would facilitate and help them read, understand, and distribute the content, especially in Form 3 and 4 in high school, they were written everywhere. possible questions.

DISCLAIMER

We are excusing the time spent in the classroom and avoiding a year of unsuccessful readings in the 4th or final year of high school not to review much of the chapters containing books, but to the extent that we suspect. We had to go back and reassure them.

We are human beings and never miss mistakes in human writings. While we can make the effort we have done little, yet we know that we will never be wrong.

PROVIDE

While the textbook is not our own and is a product of our curriculum, we have dedicated this book to every student in high school, especially Form 3 and 4.

We hope they will benefit from it.

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QUESTION AND ANSWERS ABOUT **Quantity of Heat**

1. Define Heat?

- Is the transfer of energy from a hot body to a colder one
- Is a form of energy

2. What is the thermal Energy?

- Is the total kinetic energy and potential energy of the atoms or molecules

3. What is the temperature?

- Is the amount of hotness or coldness in a place measured in degrees Celsius

4. Give the unit of Heat?

- The unit of Heat is Joule (J)

5. What is the heat quantity?

- The quantity heat required to change the temperature a substance is direct proportional to the mass of substance

6. How the mass and temperature change ?

- Temperature change produced is inversely proportional to the mass of the object
- Temperature change produced different from materials to material

7. What is the heat capacity?

- Is the quantity of Heat energy needed to change the temperature of a body by one degree.

8. Give the symbol and SI unit of Heat capacity?

- The symbol of Heat capacity is **C**.
- The SI unit of Heat capacity is **J/k** or **J/c**.

9. Tell the formula of Heat capacity?

- Heat capacity : **quantity of Heat/change of temperature**
- Heat capacity : **$c = q/\Delta t$**

10. What is the specific heat capacity?

- Is a measure of the amount of energy needed to raise the temperature of 1kg of substance by 1c

11. Specific heat capacity of some materials

Substance	Specific heat capacity J/kg

Water	4200
Ice	2100
Alcohol	2500
Aluminum	880
8Brass	377
Iron	460
Glass	670
Copper	390
Mercury	140
Air	720
Silver	230

12. Give the formula of Specific heat capacity?

- Specific heat capacity: **Quantity of Heat / mass × Change of temperature**

13.State the importance of high specific heat capacity of water?

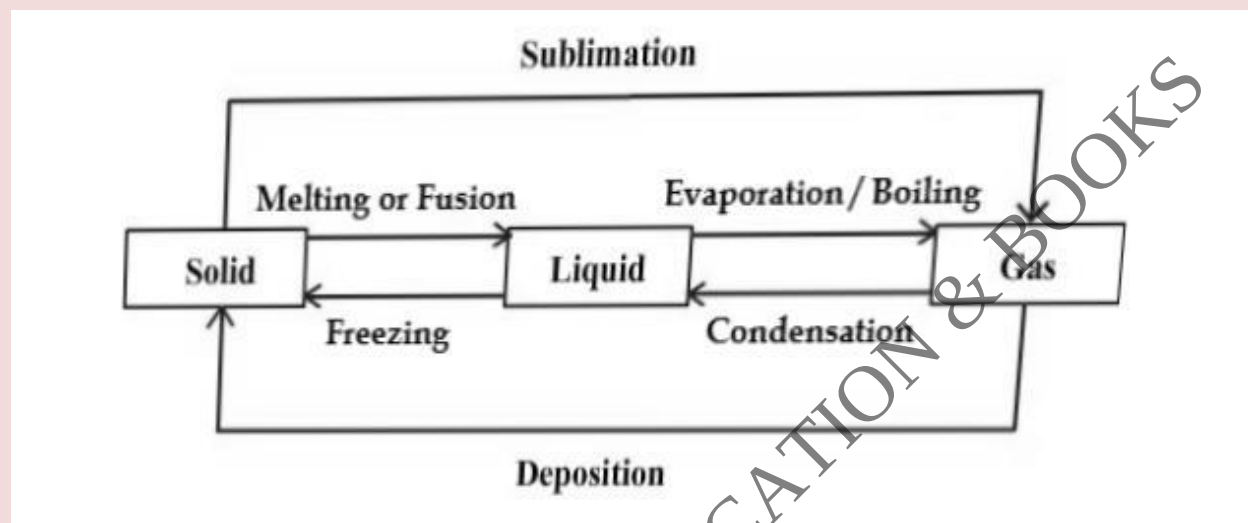
- Fermentation
- Cooling system of motor cars
- Bottled wines
- Land and sea breezes
- Over cooling of living organisms

14.When that change of state occurs?

- Occurs when matter gain or lost heat energy
 - ✓ The Change of state from solid to liquid is called **melting or fusion**
 - ✓ A Change of state from liquid to gas is called **Evaporation**
 - ✓ A Change of state from liquid to solid is called **freezing or solidification**

- ✓ A Change of state from Gas to liquid is called **condensation**
- ✓ A Change of state from solid to gas is called **sublimation**
- ✓ A Change of state from Gas to solid is called **deposition**

15. Change of states



16. When the evaporation occurs rapidly ?

- The temperature is higher
- The surface area of the liquid is large
- A wind or drought

17. List the factors increase the evaporation?

- Increasing the temperature of the substance
- Increasing the surface area of the substance
- Reducing humidity
- Blowing air across the surface

18. Tell the factors that effect the boiling point of a liquid ?

- Air pressure
- Impurities

19. What is the latent heat?

- Is the heat energy taken or released when change of state occurs

20. Give the Formula of latent ?

- $Q = ml$

21. List the types of latent heat?

- Specific latent heat of fusion
- Specific latent heat of vaporization

22. What is the specific latent heat of fusion?

- Is the quantity of Heat energy needed to change 1kg of solid in to liquid as temperature remains constant.

23. Give the Formula of specific latent heat of fusion?

- $Q = mlf$

24. Tell the SI Unit of specific latent heat of fusion?

- The SI Unit is J/kg

25. Table of specific latent heat of fusion

Substance	Specific latent heat of fusion
Ice	335000 J/kg
Copper	212000 J/kg
Lead	26200 J/kg
Aluminum	395000 J/kg
Naphthalene	148000 J/kg

26. What is the Specific latent heat of vaporization?

- Is the quantity of Heat energy needed to change 1kg of liquid in to gas without rise the temperature.

27. Give the Formula of specific latent heat of vaporization?

- $Q = mlv$

28. Tell the SI Unit of specific latent heat of vaporization?

- The SI unit is J/kg .

29. Table of specific latent heat of vaporization

Substance	Specific latent heat of vaporization
Water	2300 000 J/kg

<i>Alcohol</i>	<i>850 000j/kg</i>
<i>Ethanol</i>	<i>350 000j/kg</i>
<i>Chloroform</i>	<i>240 000j/kg</i>

30. List the Applications of latent ?

- *Evaporation*
- *Coffee machines*
- *Cold drinks*
- *Refrigerator*

31. What the function of refrigerator?

- *Is to remove heat from food inside it to outside .*

32. List the main parts of refrigerator?

- *Compressor*
- *Condenser*
- *Evaporator*
- *Expansion*

33. What are the kinetic theory and gas laws depend on ?

- *Pressure*
- *Volume*
- *Temperature*

34. List three types of gasses law ?

- *Boyle's law*
- *Charles' law*
- *Pressure law*

35. What the boyle's law state ?

- *The volume is inversely proportional to the pressure while temperature is constant*

36. What the boyle's investigates ?

- Investigate the relationship between volume and pressure while temperature is kept

37. Table of boyle's law.

Pressure (Kpa)	Volume (Cm ³)
200	50
250	40
400	25
500	20
100	10

38. Give the Formula of boyle's ?

- $P_1V_1 = P_2V_2$

39. What the Charles investigates?

- Investigates the relationship between volume and temperature {kelvin}

40. What the Charles states ?

- States that the volume is directly proportional to the temperature while pressure is constant

41. Table of Charles law .

Volume (Cm ³)	Temperature (K)
6.6	273
7.4	300
8.0	325
8.6	350
9.0	373

42. Give the Formula of Charles?

- $V_1 T_2 = V_2 T_1$

43. What the pressure law investigates?

- Investigates the relationship between pressure and the kelvin temperature.

44. What the pressure law states ?

- States that pressure is directly proportional to the temperature while volume is constant.

45. Table of pressure law.

Pressure (Kpa)	Temperature (K)
100	200
150	300
200	400
250	500
300	600

46. Give the Formula of pressure law ?

- $P_1T_2 = P_2T_1$

47. For the last three experiments we have three equations.

- $PV = \text{Constant}$ (Boyle's law)
- $V/T = \text{Constant}$ (Charles law)
- $P/T = \text{Constant}$ (pressure law)

48. Give the Formula of general gas equation?

- $P_1V_1T_2 = P_2V_2T_1$

49. List the characteristics of ideal gases ?

- Identical particles of negligible
- No intermolecular force of attraction
- Atoms undergo perfectly elastic collision with walls of container

Questions and answers about current electricity

1. what is the current electricity?

Ans. Is the branch of electricity that deals with study of electric charges.

2. What is the circuit?

Ans. Is the path motion which electric charge flows.

3. What is the current?

Ans. Electric current (I) is the flow of electric charge (Q) in a conductor or circuit.

4. Electric current to flow there must be?

Ans.

- A source such as battery.
- Conducting path (wire).
- Appliance (bulb)

5. Mention the effect electric current?

Ans.

- ❖ Heating and lighting
- ❖ Magnetic
- ❖ Chemical

6. What are the measures current?

Ans. Electric current is measured by an instrument called Ammeter.

7. What is the Unit of electric current?

Ans. Ampere (A).

8. Equation of electric current is

Ans. Current = change/time $I = Q/T$

9. What is the voltage?

Ans. When an electrons flow though a battery or other power supply, they gain electrical potential energy when electrons flows around a circuit they lose this energy when passing though components that have resistance.

10. What is the electro motive force (EMF)?

Ans. The energy transferred per unit charge within a battery.

11. What is the potential difference (BD)?

Ans. The energy transferred to circuit component per columns of charge passing.

12. What is the Unit of potential difference (P.D)?

Ans. The Unit of P.D is volt (V).

13. Equations of potential difference ?

Ans. $V = \frac{W}{Q}$ $W = QV$ $Q = It$

They by substitution $W = Itv$

14. What are the measures Voltage?

Ans. Voltage is measured voltmeter.

15. Example:-A current of 0.5A is drawn from a 12V battery for 20s.

a) How much charge is drawn in this time?

b) How much energy in joules is given to each coulomb of charge?

c) How much energy would be transferred to the circuit in 20s?

Ans.

a) $Q = It = 0.5A \times 20s = 10C$

b) $1v = 1j/C$, since the Battery has an EMF of 12v ,then 12j of energy is given to each coulomb of charge.

c) Energy transferred =work done = $QV = 12v \times 10C = 120j$

Or $W = ItV = 0.5A \times 20s \times 12v = 120j$

16. What is the resistance?

Ans. Is the force by which it resists flow of circuit.

17. What is the types of resistors?

Ans.

- ✓ Fixed resistor.
- ✓ Variable resistor .
- ✓ Light depend resistor.
- ✓ Thermistor.

18. What is the relationship between resistance and temperature?

Ans. Resistance increase with the temperature But some other conducting materials such a semiconductors resistance decrease with the temperature. The temperature does not effect the resistance of the alloys such as constantan.

19. Mention four factors which effecting resistivity of wire?

Ans.

- Length of wire
- Crossectional area
- Temperature
- The material it's made

20. What Ohm's law states?

Ans. Ohm's law states the current though a wire "conductor" is the direct proportional to the voltage when the resistance of wire is kept constant.

21. What are types of circuit?

Ans.

- ❖ Simple circuit
- ❖ Complex circuit

22. What is the types complex circuit?

- Parnell circuit
- Series circuit

23. Explain Parallel circuit?

Ans.

- ✓ Parnell circuit is the circuit which they component connected side by side
- ✓ They have same voltage $V_T = V_1 = V_2 = V_3$
- ✓ They have different current $I_T = I_1 + I_2 + I_3$
- ✓ The total resistance is found sum of reciprocal $1/R_T = 1/R_1 + 1/R_2 + 1/R_3$
- ✓ Multi switches are used to control the circuit.

24. Explain series circuit?

- ✓ Series circuit is the circuit which the components are connected end to end.
- ✓ They have different voltage $V_T = V_1 + V_2 + V_3$.
- ✓ They have same current $I_T = I_1 = I_2 = I_3$.
- ✓ The total resistance is found sum of individual $R_T = R_1 + R_2 + R_3$
- ✓ Only one switch is used to control the current.

25. The different conductors have different resistivity as shown in the below .

Ans.

CONDUCTORS "wire "	RESISTIVITY "P" (in ~ m)
Lead	2×10^{-8}
Iron	10×10^{-8}
Tangent	5.6×10^{-8}
Aluminum	2.8×10^{-8}
Copper	1.7×10^{-8}
Silver	1.56×10^{-8}

What is the battery?

Ans. A battery consists of two or more electric cell.

27. What is the cell?

Ans. Is a device that causes the flow of electric current in conductor.

28. What are the types of cell?

Ans.

- Primary cell.
- Secondary cell.

29. What is the cell capacity?

Ans. The amount of energy which a cell can store is measured in Ampere hour (Ah).

30. What are the types of current?

Ans.

- Direct current D.C
- Alternative current A.C

31. What is the safety devices?

- Switch
- Fuse
- Earth wire
- Circuit breaker

32. What is the types of lamps?

Ans. • **Fluorescent lamp**

> made up mixture of an inner gas.

And tiny mercury

Advantage:

• **Filament lamp**

> made up by heating filament

Advantage

◇ More efficient

◇ cheap to buy

◇ Long life

◇ produced attractive light

◇ Their light spread out

Dis advantage:

Dis advantage

^ expensive

◇ Less efficient

^ there light is not attractive

◇ light only once

◇ More energy is used

33. What is the switch?

Ans. Switch is a device which is used to control the flow of current in circuit

34. Types of domestic wiring?

Ans.

- Live wire
- Neutral wire
- Earth wire

35.

NAME	COLOUR OF WIRE	FUNCTION	POSITION
Live wire	Red or brown	●carried A.C from generator to appliance	Button right
Neutral wire	Black or Blue	●return A.C from house to generator ●completed the	Button left

		circuit	
Earth	Yellow or green Or only green	●safety purpose	The top the plug.

36. Earth and safety?

Ans. Is plug their wire which goes to the top of sucker and earth by being connected either metal cause appliance or expansive electronics

37. Give some examples.

- Electric kettle
- T.V screen flat (LG)
- Electrical oven
- Refrigerator

38. What is the double insulator?

Ans. Some appliance such as a vacuum deanery hair dryers found and radio.

39.what is the fuse?

Ans. Fuse is the a device which to prevent excess current .

40. What is the electric power?

Ans. Electric power is the rate converting electrical energy into another form of energy

The Unit of electric power is measured watt (W).

The symbol of electric power is represent " P"

Power = energy transferred . $P = w/t$

Time taken

$$P=IV$$

$$P=I^2R$$

$$P=V^2/R$$

41. What is the electric bill?

Ans. The electrical energy consumed in our homes is measured by a device called joule meter.

Electric cost: (energy consumed in kwh) (price/kwh)

Questions and answers about electrostatics

Q1: define electrostatic?

Ans: is the study of electric charge at rest

Q2: where does it come from the word electrostatic?

Ans: comes from Greek word (electro) means charge (static) means stationary

Q3: give examples of electrostatic ?

- Ans: if you rub a plastic comb with your hair
- If you use dry cloth to clean glass
- When the nylon jumper takes off

Q4: tell law of electric charge?

Ans: basic law **“like charges repel and unlike charges attract”**

Q5: give the SI unit of charge?

Ans: unit of electric charge is the coulomb (C)

Q6: write the methods of charging an object?

Ans: the following are three methods

- Rubbing
- Induction
- Conduction

Q7: what is the electroscope?

Ans: an instrument that detect the presence of electric charge

Q8: what is the discharging an electroscope?

Ans: an electroscope can be discharged by touching it with a finger or connecting it to earth

Q9: write the quantity of electric charge?

Ans: the unit of electric charge is coulomb(c)

- $1c = 6.25 \times 10^{18}$ power of 18 electrons
- Charge carried by one electron or proton is $1.6 \times 10^{-19}c$
- Electric charge is vector quantity
- Formula for electric charge (Q) is : $Q = ne$

Q10: what is coulomb's law ?

Ans: every two electrically charge object are brought close each other their is force between them

Q11: how to write coulomb's law in mathematically?

Ans: $F = kq_1q_2 / D^2$

Where

- Q and q= two charge in coulomb
- D= distance b/w charge
- F = force
- K= constant proportionality

Q13: define electric field ?

Ans: is the region around a charged object where it can attract or repel

Q14: tell the law of electric field ?

Ans: no two electric field even cross

Q15: Define electric field strength?

Ans: is the force per unit charge

Q16: what the SI unit of the field strength

Ans: is newton per coulomb

Q17: define potential difference ?

Ans: is the work done per unit charge as the charge is moved between these two point

Q18: what is the SI unit of potential difference?

Ans: is volt

Q19: list applications of electrostatics ?

- *Ans: electrostatic precipitation*
- *Photocopy*
- *Pain spraying*
- *Laser jet printers*

Q20: list hazards of electrostatics ?

- *Ans: lightening*
- *Refueling*
- *Operating theatres*

Q21: define capacitor ?

Ans: capacitors are device used in electronic circuit to store charge and energy

Q22: what is the SI unit of capacitor ?

Ans: is farad

$$C = q/v$$

Q23: capacitance of capacitor increase ?

- *Ans: area of plates increases*

- Distance between plates decrease
- Insulator is solid rather than air

Q2: write effect of capacitor in dc and ac circuits ?

- Ans: capacitors block dc.
- Capacitors passes ac

Q25: tell the ways connect capacitor ?

- Ans: parallel
- Series

Q26: what is series capacitor?

- Ans: when the capacitor are connect in series each capacitor has same charge on its plate
- The total capacitor in series is given

$$1/C_t = 1/C_1 + 1/C_2 + 1/C_3$$

Q27: what is parallel capacitor ?

- Ans: the potential difference across each capacitor is same
- Total of parallel capacitor is given

$$C_t = C_1 + C_2 + C_3$$

Q28: what is the charging capacitor?

Ans: charging connecting a battery

Q29: what is discharge in capacitor?

Ans: when the battery cannot connect in capacitor

Question and answers about **electronics**

Q1: define the electronics?

Ans: electronic is the study and design of control communication and computing devices that relay on the movement of electrons in a circuit

Q2: list types of materials according their electrical conductivity?

Ans: they are three types

- Conductor
- Insulator
- Semi -conductor

Q3: state band theory?

Ans: band theory state that: every material consist of two bonds called **conduction band & valence bond** the two bands are separated by gab called **for bidden gab**

Q4: what are different , conductor and insulator and semi -conductor?

Ans: they are: - conductor :-

- The forbidden gab is so small that allow the two bonds to Overlap and the electrons are free and ready in conduction bond.

Insulator:-

- The forbidden gab is so wide that any attempt to promote electrons to the valence bond cannot reach the conduction and break down

Semi-conductor:-

- The forbidden gap is bigger than the conductors and smaller than that insulators

Q4: what are types of semi -conductor?

Ans: they are two types

1: intrinsic semiconductor: is a pure semiconductor whose electrical conductivity is enhanced by temperature alone **e.g** thermistor, LDR

2: extrinsic semi -conductor: is an impure semi -conductor by adding small amount of impurities to increases their conductivity **e.g** diode, LED

Q5: define doping?

Ans: doping is process of adding impure the semi- conductor to become extrinsic semi -conductor

Q6: what are the types of extrinsic semiconductor?

Ans: they two types

1: N. Type semi -conductor

2: P. Type semi -conductor

Q7: what is the diode?

Ans: diode is a two terminal one way device which lets current to flow in one direction

Q8: what is diode consist?

Ans: consist N. Type and P. Type

Q9: state types of diode?

Ans:

- **forward biase** : diode is conduct when anode goes to the positive terminal of battery
- **reverse biase** : diode is not conduct electrical current when anode goes to the negative terminal of battery

Q10: what are uses of diode?

Ans: diode are used

- Protecting equipment
- Switching in stand by battery
- Rectification

Q11: What is rectification?

Ans: is the process of changing A.c into D. C by using diode

Q12: how many ways of rectification?

Ans: two ways

1: half rectification

2: full rectification

Q13: what are uses in reed switch?

Ans: they are

1: cell phones

2: lap top

3: refrigerator

4: car doors

Q14: what is the thermistor?

Ans: thermistor is an electrical component in which the resistance decreases as the temperature increases

Q15: what are the uses in thermistor?

Ans: they are

- Electronic thermometer
- As protection
- Time delay circuit
- Fire alarm

Q16: what is the light depend resistor?

Ans: light depend resistor or photocell is light controlled variable resistor

Q17: *LDR it's resistance what depend?*

Ans: *depend on the brightness of light*

Q18: *what are the uses of light depend resistors?*

Ans: *they are*

- *Automatic street lamp*
- *Photocopy machines*
- *Camera exposure control*
- *Night light control*

Q19: *what is the light emitting diode LED?*

Ans: *is some special diode*

Q20: *what are the uses of light emitted diode?*

Ans: *they are*

- *In dictator lamps on computers, TV, radio, cars*
- *Many clocks*
- *Calculators*
- *Radios and other electronic equipment*
- *Video recorders*

Q21: *what is the transistor?*

Ans: *transistor is a semi-conductor device used to amplify electrical signal*

Q22: *how many transistor terminals?*

Ans: *have three terminal*

- *Base*
- *Collector*
- *Emitter*

Q23: *what are uses of transistor?*

Ans: they are

- As light sensitive switch
- As time delay switch
- Temperature sensitive switch

Q24: what are the seven segment LED display?

Ans: Seven segments LED is a special type of LED display used in digital clocks video recorders and microwave ovens

Q25: what is the logic gate?

Ans: A logic gate is a physical device that performs a logical operation on one or more logical inputs and produces only one logical out put

Q26: state the five basic logic gate?

Ans: they are

- The AND gate
- The OR gate
- The NoT gate
- The NaND gate
- The Nor gate
- The NOR gate

Q27: what is the thermionic emission?

Ans: the thermionic emission is the process of emission charge particles from the surface of heating metal

Q28: what is the application of thermionic emission?

Ans: they are

- Cathode ray oscilloscope

➤ X-ray

Q29: what is the cathode ray?

Ans: cathode ray is the stream of fast moving electrons that travel from a cathode to anode

Q30: when cathode Ray discovered?

Ans: discovered end of 19 century

Q31: state the properties of cathode ray?

Ans: they are

- Cathode ray travel in straight line
- The cathode ray back k, e is transferred to the object
- Cathode ray can cause green fluorescence
- Cathode can travel speed of light

Q32: what is the cathode ray oscilloscope?

Ans: is the type of electrical instrument which is used for showing visible pattern or graphs

Q33: what are the parts of cathode ray oscilloscope?

- 1: cathode ray tube
- 2: electric gun
- 3: deflecting plate
- 4: fluorescent screen
- 5: glass envelop

Q34: list uses of cathode ray oscilloscope?

Ans: they are

- Measuring voltage

- *Medical monitoring heart beat*
- *Classification of wave form*
- *To determine velocity of sound*
- *The television*
- *To classified A.c & d.c current*

Q35. *What is the photodiode?*

Ans: is the normal semiconductor diode with a window which light can enter and work revers bias

Q36. *What is used of photodiode?*

Ans: is used to converted light energy into electrical energy

QUESTIONS AND ANSWERS ABOUT ELECTROMAGNETIC WAVE

1) What is an electromagnetic wave?

Ans: is the a wave that contains both electric and magnetic field

2) What are properties of magnetic field?

Ans. • All types of electromagnetic radiation travel through a vacuum

- a.** *they carry energy from one place to another and can be absorbed by matter to cause heating and other effect*
- b.** *they carry no charge they are not affected by the electric and magnetic field*

3) What is Gama rays?

Ans: Is the wave that has the smallest wave length and the highest frequency

4) What is used for Gama rays?

Ans: - Gama ray is used

- To sterilize food and medical equipment's
 - a. To kill cancer
 - b. To kill weevils ingrain

5) What is the hazard of gamma rays?

Ans: they can cause skin cancer

6) What is used X-rays?

Ans:-- x-rays is used

- a. To take x-rays picture to check patients bones
- b. in a detective works
- c. As part of security checking procedure in air ports

7) What are hazards of x-rays?

Ans: they can cause skin cancers

8) What is ultraviolet radiation?

Ans: is produced by hot object such as the sun or by the high temperature sparks produced during electric welding

9) What is used for ultraviolet radiation?

Ans: is used

- small amount of " UV" producer vitamin D in our skin
- it can also be used in detective works

10) What are the hazards that caused "UV"?

Ans:

- it can cause sun tan
- Large doses can cause skin cancer

11) What is the visible light?

Ans: Is the small part of the electromagnetic spectrum that is detectable by the human eye

12) What is used for visible light?

Ans: is used

- Seeking
- photosynthesis
- photograph

13) What is infra-red radiation?

Ans: is the radiation that cannot be seen by the human eye but their effect can be sense by the skin as warmth

14) What is used Infra-red?

Ans:

- bugler alarms
- remote control
- Search for people under collapsed building by using infra-red camera

15) What is the hazard of infra-red?

Ans:

- Heating

- large doses can cause skin cancer

16) What is microwave?

Ans: Is basically extremely high frequency radio wave and are made by various types transmitter

17) What is used for microwave?

Ans:

- Cooking food
- For communication with satellites and mobile phones
- Radar used to detect echoes

18) What are the Hazards of microwave?

Ans: a large dose can cause skin cancer

19) What is used for radio wave?

Ans:

- To transmit television and radio program
- Broadcasting radio TV

20) What are the Hazards of radio waves?

Ans: -can cause skin cancer

QUESTIONS AND ANSWERS ABOUT LIGHT

PART ONE REFLECTION OF LIGHT

1. Define optics?

Ans. Is the study of light and optical instrument

2. What is the light?

Ans.

- ❖ Is the form of energy which produced by matter surrounded
- ❖ Is a form of energy that can be detected by the eyes

3. How many forms of energy can be converted by in light energy?

Ans.

- ❖ Plant change light energy to chemical energy (food)
- ❖ Solar cells change light energy to electrical energy

NOTE: other forms of energies can also converted to light e.g.

- ✓ Lamps convert electrical energy to light energy

4. What is the luminous object?

Ans. are the object that produce their own light e.g sun

5. What is the non- luminous object?

Ans. Is the object that don't produce their own light e.g moon

6. Define rectilinear propagation?

Ans. Is when light travels straight line in uniform medium

7. What is the ray?

Ans. Is a line with an arrow on its head and used to represent the direction of light travelling that come from resource

8. What is the beam light?

Ans. Is the a stream of light and represented by number of rays and can be **parallel, divergent, or convergent**

9. Tell the speed of light in kilo meter or meter/second?

Ans. Speed of light in air is 300 000km/s or $(3 \times 10^8 \text{m/s})$

10. Differentiate the **transparent, translucent and opaque object**?

Ans.

Transparent material	Translucent material	Opaque material
Materials that allow light to pass-through them clearly e.g glass	Materials that allow to pass light in partially through them e.g oiled paper	Materials that do not allow light to pass through them e.g wood

11. What is the reflection of light?

Ans. Is the bouncing back of light from a shining surface

OR

Is the sending back of light rays after falling on the shining surface

12. List some important terms that related in reflection of light in mirror?

Ans. They are

- ❖ **incident ray:** Is the ray of light in which falls on surface of mirror
- ❖ **point of incidence:** is the point at the surface of mirror at which incident ray falls
- ❖ **reflected ray:** is the ray of light which is sent back by the mirror
- ❖ **normal:** is the line which is perpendicular to the mirror at the point of incidence
- ❖ **angle of incidence:** is the angle in which made by the incident ray normal at the point of incident
- ❖ **angle of reflection:** is the angle which is made by the reflected ray with normal at point of reflection

13. what are types of reflection of light?

Ans.

- **Regular reflection:** this reflection takes place very smooth surface like mirror
- **Diffuse reflection:** takes place from rough surface

14. List laws of reflection?

Ans. There are two laws of reflection and they are

- ✓ Angle of incident is always equal to the angle of reflection

- ✓ The incident ray, the normal at point of incidence of mirror and the reflected ray all lie in same plane

15. Define image?

Ans. Is where the light rays coming from an object meet or appears to meet after reflection

16. What are types of image?

Ans. They are

- ♣ **Real image** : is the image which is formed when the light rays coming from an object actually meet each other after reflection
- ♣ **Virtual image** : is the image which is formed when the light rays coming from an object do not actually meet but appears to meet when produced back ward

17. What are differences b/w real image and virtual image?

Real image	Virtual image
Can be obtained on the screen	Can't be obtained on the screen
Real image is always inverted	Virtual image is always erect
The common examples of this image is image formed on screen In cinema	The common examples of this image is image formed in the mirror

18. What are the characteristics of an image formed in plane mirror?

- ◆ It is virtual
- ◆ It is same size as the object
- ◆ It is up right (erect)
- ◆ It has left side and right side inversion

19. The formula of image formed by more than one mirror

$$\text{Number of image (N)} = \frac{360}{\theta} - 1$$

20. List some uses of plane mirrors?

Ans. Plane mirrors are using as

- ✓ Looking glass
- ✓ Many scientific uses such measuring instrument,
- ✓ In constructing periscope

21. What is the periscope?

Ans. Is equipment used to view an object over top of an obstacle

22. List some applications of periscope?

- ❖ Used to see objects over the top of an obstacle
- ❖ Used for submarines under water to view objects on surface water
- ❖ At sporting events for spectators to see over crowd

23. Mirrors can be?

Ans.

- ❖ **Spherical mirror:** are mirrors having curved reflecting
 - ✓ **Concave mirror:** spherical mirror with reflecting surface curved inward is called concave
 - ✓ **Convex mirror :** spherical mirror with reflecting surface curved outward is
 - ✓ called convex

24. List factors that depend on the formation of different type of image by concave mirror?

Ans. It depend on

- ✓ The position
- ✓ The size and
- ✓ The nature of the image varies

∴ **so different type of image are formed when the object is placed**

1. Beyond the Centre of curvature
2. At the Centre of curvature
3. b/w the Centre of curvature and principal focus
4. at principal focus
5. when the object at infinity
6. b/w the principal focus and the pole

25. summary of image formed by concave mirror

no	Position of object	Position of image	Size of image	Nature of image
1	Beyond the Centre of curvature C	b/w C and F	diminished	Real and inverted
2	At the centre of	At C	Same size	Real and

	curvature C			inverted
3	b/w C and F	Beyond C	Magnified	Real and inverted
4	At focus F	At infinity	magnified	Real and inverted
5	At infinity	At the focus	Diminished	Real and inverted
6	b/w F and B	Behind the mirror	Magnified	Virtual and erect

26. summary of images of formed by a convex mirror

no	Position of object	Position of image	Size of image	Nature of image
1	b/w infinity and the pole P	b/w B and F behind the mirror	diminished	Virtual and erect

27. list some uses of spherical mirror?

❖ **According concave mirror are used**

- ✓ Used as shaving mirrors to see large image of face
- ✓ Dentists use to view the back of the tooth
- ✓ Huge concave mirror are used to focus sunlight to produce heat in solar furnace

❖ **According convex mirror are used**

- ✓ Used as rear view mirrors in automobiles as convert wide area behind the driver
- ✓ Used as reflectors for street light bulbs as it diverges

28. Define mirror formula?

Ans. Is the formula which gives the relationship b/w the distance of image (v), distance of object (u) and the focal length of mirror (f)

IT MY BE WRITTEN

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

29. What is the mirror equation?

Ans. Is the position, nature and size of an image formed by curved mirrors can also be determined using mathematical relation

30. What is the magnification image?

Ans. Is the numerical comparison of the size of the image (h_1) with the size of the object (h_0)

Magnification = $\frac{\text{height of the image}}{\text{height of the object}}$ in symbol $m = \frac{h_i}{h_o}$

Magnification in term of the object distance and the image distance

Magnification = $\frac{\text{image distance (v)}}{\text{object distance (u)}}$

31. Summary of sign of convection of mirrors

Ans.

no	quantity	Positive when....	Negative when....
1	Object location (u)	Object is in front of mirror (real object)	Object is in the back of (mirror virtual object)
2	Image location (v)	Image is in front of mirror (real image)	Image is in the back of (mirror virtual image)
3	Image height (h_1)	Image is up right	Image is inverted
4	Focal length (f)	Mirror is concave	Mirror is convex
5	Magnification (m)	Image is up right	Image is inverted

PART TWO REFRACTION OF LIGHT

32. define refraction of light?

Ans: is the bending of light when light travels from one medium to another medium of different density

33. what is called change in speed occur when light passes from one medium to another ?

ans. is responsible for bending light or refraction

34. what is called refractive index ?

Ans: is the ration of the speed of light in vacuum to speed of light in other medium

35.formula of refractive index ?

Ans: refractive index(n) = speed of light in vacuum (c)/ speed of light in the other medium

36.write the facts about refraction of light ?

- Ans: a ray of light is bent towards normal when it enters an optically denser medium at an angle
- A ray of light is bent away from normal when it enters an optically less denser medium at an angle
- A ray of light that travelling along the normal is not refracted because it is normal to the boundary between the two medium
- If a ray of light strikes a rectangular block of glass it refracts towards the normal and when the ray passes out of the block it refracts away from the normal so the incident ray and the emergent ray are parallel

37.tell the laws of refraction ?

- Ans: the incident ray the refraction ray and the normal all lay on same plane
- The sine of the angle of the incidence is directly proportional to the sine of the angle of refraction

38.what is called second law ?

Ans: called snellius law

Snellius law can be written as

$$\sin I / \sin R = \text{constant}$$

39. list application of refraction of light ?

Ans:

1. Apparent depth
2. dispersion effect
3. The stars seem twinkling of light
4. Variation in the size of the sun

40. what is the total internal refraction ?

Ans: when the light passes from an optically denser medium to less dense medium

40. what is critical angle ?

Ans: the angle of incidence at which its angle of refraction is 90

Q: where the total internal refraction occur only when ?

- Ans: light from high refractive index medium is directed toward a low refractive medium
- And the angle of incidence is greater than the critical angle

41. write the application of total internal refraction ?

Ans:

1. Mirages
2. Right angle prisms can be used to reflect light through 90 and 180
3. Sparkle of diamond
4. Light pipes and optical fibres
5. Flash eye view

42. list application of optical fibres ?

- Ans: to direct light into otherwise inaccessible places
- Fibre optics is widely used in telecommunication

43. write the advantage of fibre optical communication

- Ans: they are light more flexible and cheaper to lay and need fewer booster stations than copper cables
- A single fibre can carry thousands of telephone calls at the same time without interference

44. what is the lens?

Ans: is a piece of glass or transparent plastic with curved surface

45. why surface of lens is curved?

Ans: because of the curved surface it can converges or diverges light rays that pass through it and the object seen through the lens

46. write the most common types of lens?

Ans: are two main types

- Convex lens
- Concave lens

47. what is the concave and convex lens,

Ans: a convex lens is thickest at the centre and thinnest at sides

While concave lens is thickest at the sides and thinnest as centre

48. why convex lens are called converging lenses ?

Ans: because they converge the light rays that pass through it to point called focus

49. why concave lens are called diverging lenses ?

Ans: Because they diverge the light rays that pass through

50. Write the terms used for spherical lenses?

Ans: are the following

- ✓ Centre_of_curvature
- ✓ Principle_axis
- ✓ Optical_centre
- ✓ Radius of curvature
- ✓ Principle focus
- ✓ Focal length

51. define the power of lenses?

Ans: is defined as the reciprocal of its focal length measured in meters

52. write the SI unit of power?

Ans: the unit of power is dioptre

53. write the rules of image construction of spherical lenses?

Ans: we have use the following rules

Rule 1:

A ray parallel to the principle axis will pass through the principle focus after emerging the lens

Rule 2:

A ray passing through the principle focus will be parallel to the principle axis after emerging the lens

Rule 3:

A ray passing through the optical centre is not bent

54. what is the image formed by convex lens?

Ans: convex mirror can form both virtual and real image depending on the position of the object

55. write the rules of convex lens?

Ans: are the following rules

- ✓ When the object is beyond $2F$, the image is between F and $2F$. It real, inverted and diminished
- ✓ When the object is at $2F$, the image is also at $2F$. It is areal, inverted and same size as object
- ✓ When the object is between F and $2F$, the image is beyond $2F$. It is real, inverted and magnified

- ✓ When the object is at F the image is at infinity and it is real
- ✓ When the object is between F and the lens, the image is same side as the object. It is virtual, upright and magnified
- ✓ When the object is at infinity, the image is at F. It is real inverted and diminished

56. write the table to summarize the characteristics of image formed by concave mirror?

Ans:

Object position	Image position	Real or virtual	Upright or inverted	Size
Infinity	Focal point	Real	Inverted	Smaller
Beyond 2F	B/w F and 2F	Real	Inverted	Smaller
At 2F	At 2F	Real	Inverted	Same
B/w F and 2F	Beyond 2F	Real	Inverted	Large
At F	Infinity	Real		
B/w F and lens	Same side	Virtual	Upright	Large

57. what is the image formed by concave mirror?

Ans image formed by concave lenses are always virtual, upright, diminished and same side as the object

58. write the lens formula?

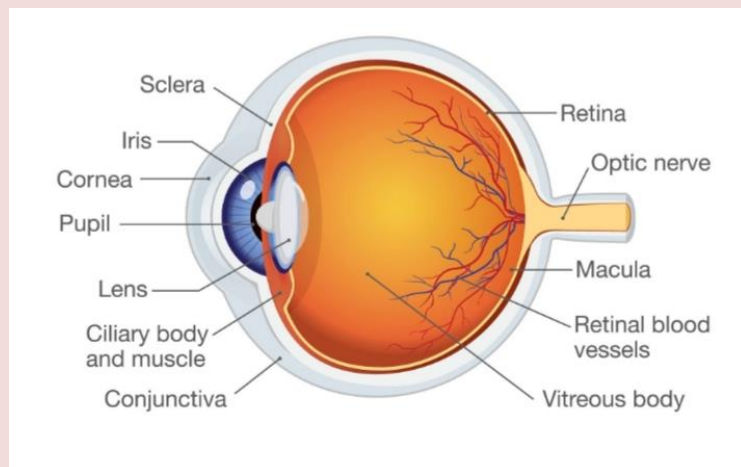
Ans: $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ where F= focal length u=object distance v=image distance

This formula applies to both concave and convex lenses, by using the following sign convention

- ✓ All distance are measured from the optical centre of the lens
- ✓ All distance of real objects and real image are positive
- ✓ All distance to virtual images are negative

- ✓ The focal length of a convex lens is positive ; that of diverging lens is negative

59. Draw the image of eye?



Each part if the eye has especial function

- ✓ **Cornea:** it is the front part of the eye; its tough structure and acts like a window
- ✓ **Iris:** this is the coloured part of the eye. The middle part of the iris its pupil which control the amount of the light entering the eye
- ✓ **Aqueous humour:** this is the liquid which sites behind the cornea. It focuses the light rays to support the lens
- ✓ **Lens:** it's jelly like structure which is transparent
- ✓ **Retina:** its the light sensitive part of the eye. And its turn light rays into signal of image than brain can understand
- ✓ **Sclera:** its the white part of the eye and its function is for protection
- ✓ **Choroid:** it is the layer of the eye that lies between the retina and sclera
- ✓ **Optical nerve:** is the route of the messages from the retina to the brain
- ✓ **Vitreous humour:** this is a clear liquid that fills the space between the lens and the retina
- ✓ **Ciliary muscles:** these are the muscles that control the shape if the lens

60.list differentiations b/w camera and the eye?

according	Camera	eye
lens	Rigid(glass or plastic)	Flexible.

	Contains several parts	One place
Focusing	By moving the lens relative to the film	By changing shape of the lens
Aperture	Controlled by diaphragm	Controlled by iris
exposure	Controlled by shutter	Continuous
Light sensitive surface	Photographic film	Retina

61. list some problems that can be seen in human eyes and how to solve?

❖ **Short-sightedness(myopia)**

- ✓ The eye is unable to focus objects that are far away.
This happens one of the following
 - The eye ball is too long
 - The eye lens is thick and more power full
- ✓ This problem can be corrected by using diverging lens

❖ **Long-sightedness (hypermetropia)**

- ✓ The eye can see distant objects clearly but not near one .
Rays from near object are focused behind the retina b/c one of the following
 - The eye ball is too short
 - The lens is very thin so it has less power
- ✓ This problem can be corrected by using converging lens

❖ **Astigmatism**

- ✓ the eye cannot focus horizontal and vertical lines simultaneously
- ✓ this problems can be corrected by using cylindrical lens

62.what is the presbyopia?

Ans. This defect arises because of old age

63. list some uses of lens?

❖ Simple microscope

- ❖ Compound microscope
- ❖ The camera
- ❖ The projector and telescope

64. what is the simple microscope?

Ans. Is a convex lens of short focus

65. what is the compound microscope?

Ans. Microscope is sometimes called a compound microscope because two-focus converging lenses are used to magnify an object

64. what is the camera?

Ans. Is a light-tight box at least one converging lens at the front

66. what is the projector?

Ans. Is an optical instrument used to cast images on a screen.

67. list types of telescope?

Ans.

- ❖ **The refracting telescope** : consist of a convex lens with a long focal length, the objective lens, and convex lens with short focal length the eyepiece lens
- ❖ **The reflecting telescope(Newtonian telescope)**: this use a concave parabolic primary mirror to collect and focus incoming light into a flat secondary mirror that in reflects the image out of opening at the side of the main tube and into an eyepiece.

QUESTIONS AND ANSWERS ABOUT MOTION

1. Define motion ?

- *Is the most fundamental and common physical phenomenon.*

2. Define mechanics ?

- *Is a fundamental area of physics which studies the universal principles of motion.*

3. What the aim of mechanics?

- Is to analyses and predict the motion of bodies resulting from the different interaction.

4. State the branches that consist mechanics?

- Is two branches
 - ✓ Kinematics
 - ✓ Dynamics

5. Define kinematics?

- **Kinematic** describes the motion with out considering the causes of motion .
- **Kinematic** is the study of motion in terms of distance ,displacement, speed ,velocity and acceleration .

6. Where the word kinematics comes from ?

- Comes from a Greek word **kinema**, meaning **motion** .

7. Define distance?

- The total length of the path travelled by the object from one location to another .

8. Give the SI Unit of Distance?

- SI Unit of distance is **Meter (M)**

9. Define displacement?

- Is the distance moved in specific direction .
- In another word is the shortest distance of the moving body from its starting position.

10. Give the SI Unit of displacement?

- The SI unit of displacement is **Meter (M)**.

11. Compare distance and displacement.

Distance	Displacement
Scalar quantity	Vector quantity
Maximum distance b/w two points	Minimum distance b/w two points
Distance covered is always positive	Displacement covered May be positive, negative or zero

12. Define speed ?

- Is defined as the distance travelled by an object per unit of time .

13. Give the SI unit of speed?

- The SI unit of speed is **Km/h** or **Mile/h**.

14. Tell the formula of speed ?

- **Speed** : distance travelled /time taken or $V = \frac{s}{t}$

15. What is the speedometer ?

- Is an instrument measured the speed of a car .

16. This is a speedometer.**17. State types of motion?**

- Translator motion
- Linear motion
 - Curvilinear motion
- Circular motion
- Rotational motion
 - Revolution motion

- Oscillatory motion
- Random motion

18.State the types of speed ?

- Constant speed
- Non uniform speed
- Average speed
- Instantaneous speed

19.When the constant speed occurs ?

- Occurs when the object travels the same distance in equal period of time .

20.What is the average speed?

- Is the total distance travelled by an object per unit of time.

21.What is the instantaneous speed?

- Is the speed at a specific instant in a time .

22.What is a velocity ?

- Is the rate of change displacement of an object a vector quantity.

23.Tell the SI Unit of velocity?

- The SI unit of velocity is **m/s**

24.Give The formula of velocity ?

- **Velocity =displacement ÷ time.** $V = \frac{s}{t}$ $S = Vt$

25.Compare speed and velocity?

Speed	Velocity
Distance moved per unit time.	Displacement moved per unit time.
Scalar quantity	Vector quantity
Measured by (M/s)	Measured by (M/s)
Donated by the latter (V)	Donated by the latter (V)

26.State some instrument that determines the speed of an object?

- Ticker tape timer.
- Two light gates.

- Motion sensor .

27.What is Acceleration ?

- Is the rate of change of its velocity with the time .

28.Give the SI Unit of acceleration ?

- The SI unit of acceleration is m/s^2 .

29.Tell the formula of acceleration?

- $A = V - U / t$

30.What means deceleration or retardation?

- Means the acceleration is a negative.

31.State the types of acceleration?

- Two types of acceleration is :
 - Uniform acceleration
 - Non uniform acceleration

32.Which are used the motion graphs ?

- Are used to represent the motion of object .

33.What is the distance time graph?

- Is a graph of distance travelled against time taken.

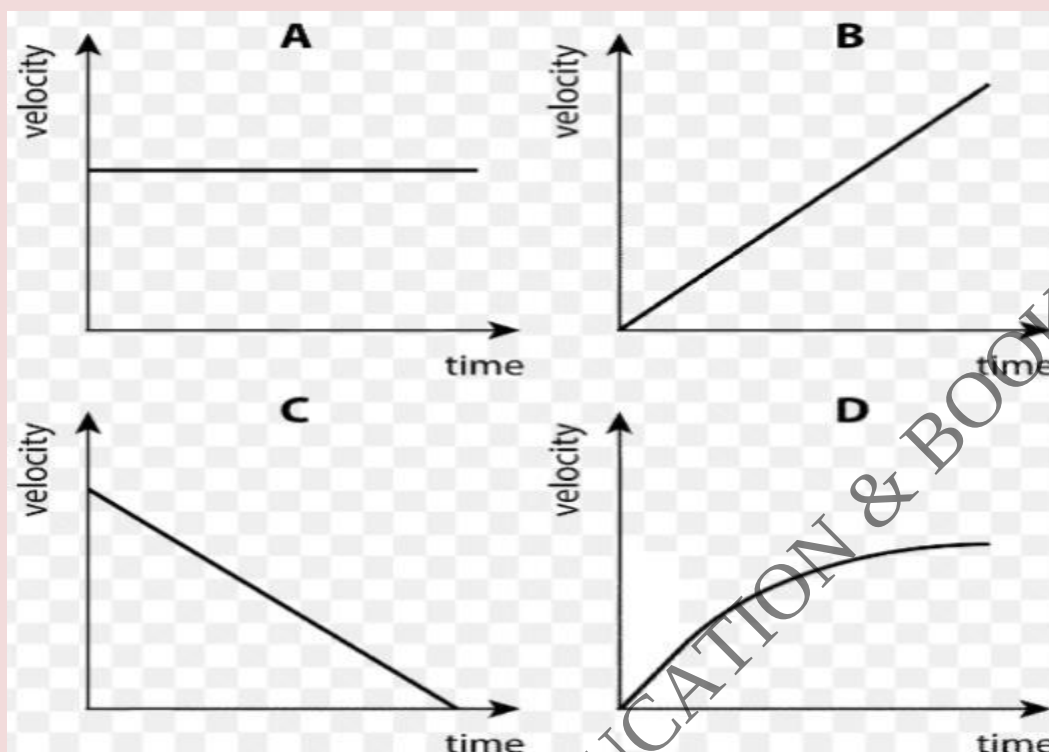
34.What is the displacement time graph ?

- Is graph of displacement covered against time taken.

35.State types distance time graphs ?

- Constant speed or uniform speed
- Stationary object
- The steeper ,the gradient, the greater the speed.
- Non uniform speed .
- Moving opposite direction.

36.Drawing distance time graphs



37. When you use these equations take the following steps.

- **Step one :** write down the quantities which you know and the quantity which you want to know .
- **Step two :** choose the equation which links these quantities and substitute in the values.
- **Step three :** calculate the unknown quantity.

38. Equations for uniform acceleration.

First equation	$V=U+at$
Second equation	$S= (U + V/2)t$
Third equation	$S=Ut + \frac{1}{2} at^2$
Fourth equation	$V^2=U^2+2as$

DYNAMICS**1. What is the Dynamics?**

Ans: is a branch of mechanics deal with the motion of an object under the action of force

2. What are the newton's law of motion?

Ans: are three:-

- **Newton's first law of motion** : the law of inertia
- **Newton's second law of motion**: the law of acceleration
- **Newton's third law of motion** : law of conservation of momentum

3. What is the balanced force?

Ans: is the forces that are equal in size but opposite in direction

4. What is the unbalanced force?

Ans: is the forces that are not equal in size acting on an object

5. What happen if the on an object are unbalanced?

Ans: happens

- An object that is not moving starts to move
- An object that is moving changes speed or direction

6. What is the resultant force?

Ans: is the size of the overall force acting on an object

7. What is the state of newton's first law of motion?

Ans: newton's first law of motion states that(low of inertia) :-

• **"a body will continue its state of rest or uniform motion in straight unless acted up on by external unbalanced forces"**

8. What is the inertia?

Ans: is the ability of an object to preserve its state of motion

9. What inertia depends on?

Ans: inertia is direct proportional to the mass and velocity of an object

10. Give one example of inertia?

Ans: we usually shake up the ketchup to get lost bit

11. What is the state of newton's second law of motion?

Ans: newton's second law of motion states (law of acceleration) that:-

- **" the acceleration of an object is directly proportional to the force and inversely proportional to the mass of the object**

12. What is the S.I unit of force?

Ans: is newton N

13. What is the S.I unit of weight?

Ans: is Newton N

14. What is formula of force

Ans: force = mass $\times$ velocity. $F = M \times V$

15. Define Acceleration due to gravity (g)?

Ans: is the inherent property of earth to attract every object to its centre.

16. Define terminal velocity?

Ans: is the object falls in constant velocity

17. Tell formula of acceleration due to gravity(g)

Ans: $F = m.a$ or. $W = m.g$

18. Define air resistance?

Ans: is due to the colliding of an object with molecules of air

19. Define free falling object?

Ans: is the object that is falling under the influence of gravity

20. Write characteristic of free falling object?

Ans: there are two important characteristics:-

- **Free-falling objects do not encounter air resistance**
- **All free-falling objects (on earth) accelerate downwards at a rate of 9.8m/s^2 (10m/s^2)**

Original Form formula = For free falling motion

$$V = u + at$$

$$V = u + gt$$

$$V^2 = u^2 + 2as$$

$$V^2 = u^2 + 2gh$$

$$S = ut + \frac{1}{2}at^2$$

$$h = ut + \frac{1}{2}gt^2$$

$$S = [v+u/2]t$$

$$h = (v+u/2)t$$

21. Explain momentum?

Ans: is the quantity of motion in a moving body

- is the product of mass and velocity

- is a vector quantity and it has direction

- the S.I unit of momentum is kgm/s or Ns

- momentum is directly proportional to the mass and velocity of the object

22. What is the formula of momentum?

Ans: Momentum(p) = mass(m) $\times$ velocity(v)

Initial momentum = mu final momentum = mv

Change of momentum = $mv - mu = m(v - u)$

23. What is state of newton's third law of motion?

Ans: newton's third law of motion state that:-

- **"For every action there is equal and opposite reaction"**
- **These two forces are equal in magnitude and opposite in direction**

24. Define action and reaction?

Ans: - action : is the force exerted on the first object

- reaction : is the force exerted on the second object

25. Explain the conservation of momentum in collision of two balls?

Ans: $m^1u^1 + m^2u^2 = m^1v^1 + m^2v^2$

Law of conservation of momentum :- is total momentum before collision equals total momentum after collision.

Vectors

1.what are classified for quantities ?

Ans:

- **scalar quantity**
- **vector quantity**

2.what is the scalar quantity ?

Ans: Any quantity that has only magnitude

3.what is the vector quantity ?

Ans: Any quantity that has both quantity and direction

4. Give same examples of scalar and vector quantities ?

Scalar Quantity	Vector Quantity
mass	Force
speed.	Vector
distance	Displacement
temperature	Electric field
energy.	Acceleration

5. How many ways can solve by combining vector ?

Ans:- - By scale drawing
 - By trigonometry

6. in trigonometry vectors can be done in one of two ways

✓ if two vectors are right angles you can use Pythagoras theorem. Can be found

$$R^2 = A^2 + B^2 \quad R = \sqrt{A_y^2 + B_x^2}$$

$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}} = \frac{A_y}{B_x}$$

Note R= resultant vector

A_y = vertical vector

B_x = horizontal vector

✓ if two vectors are not at right angle you can use parallelogram law

7. What is the resultant ?

Ans:- The resultant number of vector is the single vector whose event is the same as the individual vectors acting together

7. How many ways we can addition vectors ?

Ans:-

- **Straight line vector**
- **Right angle vector {perpendicular vector}**

8. What we are used to determine non-perpendicular vector ?

Ans:-

- **We use cosine rule to determine magnitude of resultant vector**
- **We use sine rule to find the direction of the resultant vector**

9. When the object is equilibrium ?

Ans:- When we work out and the resultant is zero the object is equilibrium

10. When the object is not equilibrium ?

Ans:- When we work out and the resultant isn't zero the object is not equilibrium

11. What is the resolution vector?

Ans:- Is the separation of single vector into two or more vectors acting in a given direction on the same direction

horizontal component is given by $F_x = f \cos \theta$

Vertical component is given by $F_y = f \sin \theta$

12. what is the projectile motion?

Ans. is the particle that sent moving into air

13. what is the trajectory?

Ans. is the path followed by projectile

14. what is the range?

Ans. is the horizontal distance travelled by projectile

CIRCULAR MOTION

1. Define circular motion ?

Ans. Is the motion of object in circular path with constant speed

2. What is the centripetal acceleration?

Ans. Is the acceleration of an object in circular path

3. What is the formula of centripetal acceleration?

Ans: $a_c = v^2/r$

4. how many ways object can accelerate ?

ans. :-

- **Changing direction velocity**
- **Changing magnitude of velocity**
- **Changing in both magnitude and direction**

5. define centripetal force?

Ans. Is the force that cause centripetal acceleration

6. what are the factors that increase centripetal force?

Ans:-

- **The mass of the body increase**
- **The velocity of the object increases**
- **The radius of the circle decreases**

7. What is the formula of centripetal force?

Ans:-

- **$F_c = mv^2/r$**
- **$F_c = mr\omega^2$**

8. What is angular velocity?

Ans. Is the rate of change of angular displacement

9. Angular velocity can be found?

Ans:-

- **$\omega = \text{angular displacement/time} = \theta/t$**

- in relationship b/w angular velocity and frequency has this formula

$$\omega = 2\pi f$$

10. what is the linear velocity?

Ans:- is the rate of change of linear displacement

11. what is the formula of linear velocity ?

Ans:- linear velocity (v) = linear displacement/time = s/t

12. what is the formula of linear speed?

Ans:- Linear speed = radius $\times$ angular velocity. ; $V = r \omega$

13. List some applications of circular motion?

Ans:- A car negotiating a circular path on a level of horizontal road

14. What newton's law of universal gravitation states?

Ans. The force of attraction between two objects is directly proportional to the product of two masses of the objects and inversely proportional to the square of the distance between them

- $F = G \frac{m_1 m_2}{d^2}$

Work, energy and power

1. What is the work done?

Ans. Work is done on an object when applied force moves through distance

2. What we need to do work?

Ans.

- A force must be exerted to an object
- The object must move a result of this force

3. What is the unit of force?

Ans. The unit of force is joule

4. Work is scalar or vector ?

Ans. Work is scalar and have no direction

5. What is the formula of work ?

Ans. $W = FS$ or work = force $\times$ distance ; $W = F \cos \theta$; $W = MGH$

6. WHAT IS THE GRAVITATIONAL POTENTIAL ENERGY?

ANS. Is the energy raised the object

- When you throw an object to the upward the force that overcome downward to the object is say gravitational potential energy

7. What is the formula of G.P.E.?

ANS. $GPE = F.S$

8. WHAT IS THE KINETIC ENERGY ?

ANS. Is the energy of moving object or is the ability that has to do work and the result is motion

9. What Kinetic energy depends ?

Ans. The mass and velocity of an object the greater the mass and velocity is greater the kinetic energy

10. Kinetic energy can be found by ?

Ans:-

11. WHAT is the law of conservation of energy state?

Ans. This law states

"Energy can't be created or destroyed but it can be converted from one form to another"

12. What is the GPE and KE transformation?

Ans. This state

"Energy is transformed from gravitational potential energy to kinetic energy"

13. Define power?

Ans. - Is the rate of doing work

- Is the energy transferred per unit time

14. What is the unit of power?

Ans. The SI unit of power is watt and $1\text{ watt} = 1\text{ J/s}$

Note :- Power is scalar quantity

15. What is The formula of power ?

Ans:- formula of power is:

$$P = w/t \quad \text{or} \quad FS/T$$

16. What is deformation ?

Ans. Is a change in the shape or size of an object due to an applied force

17. List types of deformation of solid ?

Ans. There are several types of D.S and they are:-

- **Elastic deformation** : this type of deformation is reversible E.g . rubber
- **Plastic deformation** : this type of deformation is irreversible e.g . plastic
- **Fracture deformation** : this type of deformation is also irreversible . a break occurs after the material has reached the end of elastic

18. What is the force that cause the deformation of solid?

Ans. Is the compressive or tensile

19. Define compressive ?

Ans. Is when force that applied to the object is cause squeezing

20. Define tensile?

Ans. Is when the force of an object cause to stretch

21.What is the stiffness?

Ans. Is the property that solids resist the forces that cause the change their shape and size

- Is the rigidity of an object

22. In stretching of spring hook's law states?

Ans. Extension of spring is direct proportional to the stretching force provided the elastic limit is not exceeded

23.What is the equation of constant spring

Ans. $K=F/X$

The SI unit of the constant spring is NEWTON PER METER

WE FIND THE SPRING CONSTANT K FROM THE GRADIENT OF SECTION OE

$K=1/\text{gradient OE}$

24. What are the factors effecting spring constant?

Ans.

- **the type of material used to make spring** : different material have different spring constant and stretch differently

- **length of spring** :the shorter the spring the stiffer and therefore the greater spring
- **number of turn per unit length** :more number of turns per unit length the stiffer the spring
- **thickness of the wire used to make the spring**: a thicker wire is stiffer than thin wire

25. how spring is arranged ?

ans. Spring can be arranged

- **Series** : is when spring is arranged end to end
- Series spring can be found
- **Parallel** : is when spring is arranged side by side
- Parallel can be found

26. Compare series spring and parallel spring?

Ans. **Series spring**

Parallel spring

- Spring series are easy to stretch.
- Spring parallel are difficult to stretch.
- This arranged end to end.
- This arranged side by side.

27. Define tensile stress ?

Ans. Is the tension per unit area normal to that area to the area

28. Formula of stress is

$$\text{Stress} = F/A$$

- In some books you see stress give (sigma, a Greek letter 's,) or ρa) $\sigma = F/A$

29. Define tensile strain?

Ans. Is the extension per unit length

- **Strain**=extension(m)/original length(m)
Sometimes the strain expressed as percentage
- **Strain** $\epsilon = \Delta l/l$

30. What is the young modulus ?

Ans. Is the ratio of then tensile stress and the tensile strain.

- Also we can write

- **Young modulus = tensile stress/tensile strain**

Tensile strain=extension/original length

Tensile stress=force/are

Questions and answers about wave

Q1: define the wave motion?

Ans: is a travelling disturbance in a medium that transfers energy and information from its source to another point without transferring the particles of the medium

Q2: what is the medium?

Ans: is a substance or material that carries the disturbance from one place to another place

Q3: where ever there is a wave motion, there must be

- A source of oscillation
- A material or field which can transmit oscillation

Q4: what is the progressive wave?

Ans: is a result of repetitive pulses a medium or space

Q5: what is the pulse?

Ans: is a single disturbance that transfers energy from one place to another place

Q6: list the types of wave?

Ans: are two progressive wave and they are

- ✓ Transverse wave
- ✓ Longitudinal wave

Q7: define transverse wave?

Ans: is a wave that its oscillation is perpendicular to the direction of the wave motion in other word

- The particles in the medium vibrate up and down they from **crest and trough**

Q8: give the examples of transvers wave?

Ans: water wave, light wave and radio wave

Q9: define longitudinal wave?

Ans: is a wave that oscillations are parallel to the direction of the wave motion

In another word

- The particles in the medium vibrate to and fro they from **compression and rarefaction**
- Properties of transvers wave are
 - (a) The amplitude and time of the wave motion remains the same
 - (b) every particle begins to vibrate a little later than its proceeding particle
 - (c) the transvers waves are in the form of crest and trough

Q10: tell the compression and rarefaction?

Ans: compression is point where the particles are very concentrated

And rarefaction is point where particles are far apart

Q11: Give the examples of longitudinal wave?

Ans: sound wave and wave of spring

Q12: write the characteristics of wave?

Ans: periodic wave have the following characteristics

- Wave length
- Frequency
- Period
- Amplitude
- Wave speed

Q13: what is the wave length?

Ans: is the minimum distance that the wave repeat it self

Q14: write the measurement of the wave length?

Ans: measured in meter "m"

Q15: what is the frequency of wave?

Ans: is the number of wave generated by the source per second

Q16: write the measurement of frequency of wave?

Ans: measured by in cycle per second (C/s) or per second but the SI unit of frequency is **hertz(Hz)**

Q17: what is the period?

Ans: is a time taken for one cycle(or wave) in seconds

Q18: write the formula of frequency wave?

Ans: period=1/frequency. Or. $T=1/f$

Q19: write the measurement of period of wave?

Ans: measured by second(s)

Q20: what is the amplitude?

Ans: is a maximum displacement of a wave from its resting position

Q21: write the measurement of amplitude?

Ans: measured by meter "m"

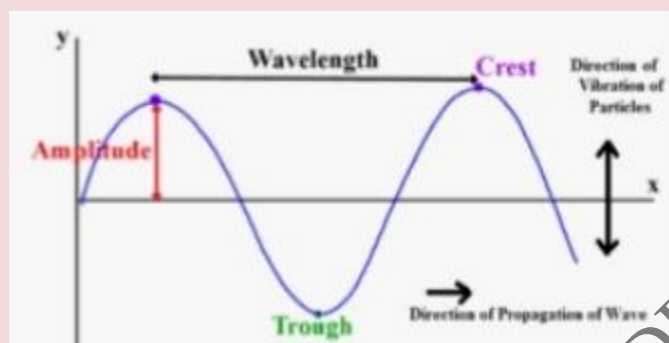
Q22: what is wave speed?

Ans: is the distance travelled by any point of the wave in one second

Q23: write the formula of the wave speed?

Ans: $\text{speed}(s) = \text{distance travelled}(s) / \text{time taken}(t)$

Q24. Draw the shape of the wave?



Ans: standard form of wave

Q25: list the properties of wave?

Ans: all wave have the following properties

1. Reflection of waves
2. Refraction of waves

Q26: what is the reflection of waves?

Ans: is the bouncing back of wave when it arrive a barrier

Q27: what is the refraction?

Ans: is the bending of wave when wave enter a medium of different density to the first medium at an angle

Q28: write the causes of refraction wave?

Ans: caused by the change in speed of the wave

Q29: what is the interference?

Ans: in a region where wave trains from coherent sources “overlap” superposition

Q30: write the principle of superposition?

Ans: states that **“the displacement at any point of the wave is the vector sum of individual displacement”**

Q31: what is the stationary wave?

Ans: when two waves of the same frequency, wavelength and amplitude are travelling in opposite direction meet

Q32: Write the points of stationary wave?

Ans: the following point about stationary wave

- ❖ The distance between two successive nodes is half a wavelength
- ❖ The antinodes and the nodes don't move along the medium
- ❖ There is no net energy transfers in the direction of the wave

Q33: compare the stationary wave and progressive wave?

Ans: the comparisons of stationary and progressive waves are follows

Stationary waves.

1. appears to stationary another

2. combination of two progressive Wave moving in opposite direction.

3. no transfer energy takes place

Progressive waves

1. appears to travel from one point to

2. consist of one moving in one direction

3. There is flow of energy

Q34: write the characteristics of stationary wave?

Ans: characteristics are the following

- The waveform remains stationary
- Nodes and antinodes are formed alternately
- Pressure changes are maximum at nodes and minimum at antinodes

PART TWO SOUND

Q1: define sound?

Ans: is a form of energy propagated by a vibrating body which can travel from place to place

Q2: define sound wave?

Ans: is a mechanical longitudinal wave

Q3: what is the audible range?

Ans: sound frequency in the range **20 to 20000 hertz(Hz)**

Q4: what is the infrasonic?

Ans: is a sound waves that have frequency below **20 Hz**

Q5: what is the ultrasonic?

Ans: is a sound wave that have frequencies above **600Hz to 4800Hz**

Q6: write the examples of sound?

Ans: examples of source of sound include

- Vocal cord
- Tuning fork
- Car moving
- Vibrating string

Q7: what is the bell jar?

Ans: is laboratory equipment used for creating a vacuum

Q8: how does the experiment work?

Ans: the experiment is done by placing an electric bell in the bell jar

Q9: Why sound is not audible to our ears ?

Ans: because of the vacuum inside the ajar

Q10: why sound wave cannot travel through vacuum?

Ans: because wave need a material medium for its propagation

Q11: where sound can travel ?

Ans: wave travel in solid liquid gas

Q12: list factors effecting velocity of sound wave in air ?

- *Ans: temperature air*
- *Humidity*
- *Wind*
- *Density*

Q13: write property of sound ?

- *Ans: reflection*
- *Refraction*
- *Interference*
- *diffraction*

Q14: what called reflected sound

Ans: is echo

Q15: write the experiment to demonstrate reflection of sound?

- *Ans: apparatus*
- *Procedure*
- *Observation*
- *Conclusion*

Q16: write application of reflection of sound

- Ans: determine of speed of sound
- Echolocation

Q17: define echolocation ?

Ans: is the process finding distance by sending ultrasonic plus and detecting after reflection

Q18: where refraction of sound takes place ?

Ans: occur the boundary between two media in which the speed of travel is different

Q19: explain why sound is usually more difficult to hear in the day time than at night ?

Ans: you can notice on hot day or cold night

- On hot day the air near the ground is hot so the sound wave bends upward from the hot air into the cold air
- On a cold night the air near the ground is cold and so the sound wave bend downward . This is why you can sometimes hear sound from a long way away if the night air is cold

Q20: define interference of sound ?

Ans: is phenomenon in which two sound wave superpose to form resultant wave of greater or lower amplitude

Q21: what constructive interference ?

Ans: if two wave reinforce which each other and become louder

Q22: what is destructive interference ?

Ans: if the two wave cancel each other

Q23: define diffraction of sound ?

Ans: is the spreading of sound wave when they pass edges and go through small openings

Q24: what is the Doppler effect?

Ans: is a change in frequency of a wave

Q25: Write the applications of Doppler effect?

Ans: here is how they work

- a) A police officer takes a position on the side of the road*
- b) The radio wave strike the vehicle and bounce back toward the radar gun*

Q26: application of ultrasound?

Ans: A) is used in SONAR

B) is used to investigate inside the human body

. C) is used in industry for detecting flaws in metal blocks without damaging them

Q27: define music note ?

Ans: originate from a source vibrating in uniform manner

Q28: list effect in music note ?

Ans: Intensity and loudness : the intensity of sound is the time rate at which the sound energy flow through a unit area

B. Frequency and pitch

Pitch : is a property of sound determine by its frequency

C. Harmonic and qualities

Fundamental : a taut wire which vibrate as a single unit produce its loss frequency

Q29: define music instrument ?

Ans: is an instrument created or adapted to make music sound

Q30: write classification of music instrument ?

- *Ans: stringed instrument*
- *Wind instrument*
- *Precaution instrument*

Q31: where stringed instrument produce?

Ans: when the guitar vibrate

Q32: sound produce by string depend following factor?

- *Ans : length of the string in meter*
- *The tension of string in newton*
- *Mass per unit length*

Q33: define wind instrument?

Ans: in this category, standing wave is produce by longitudinal stationary wave

Q34: define percussion instrument?

Ans: are made out of just about any material

Questions and Answer about Radio Activity

1. what is the Radio Activity ?

- *is the emission of Sub atomic particles or rays from the nucleus of the Atom*

2. state Types of Radiations ?

- *Alpha radiation*
- *Beta radiation*
- *Gamma radiation*

3. how Occur Radio activity ?

- Natural Radio Activity
- Artificial Radio Activity

5.mention characteristics of Radioactive material ?

- ❖ They are continually decaying (Breaking down) into similar atoms as result of emitting radiations
- ❖ Radiations From radio activity elements produce bright flashes when they strike fluorescent Compounds
- ❖ Radiations from radioactive material cause the Ionization of Air molecules

6. State properties Alpha particles ?

- ❖ Alpha particles most Ionization
- ❖ Alpha particles it's like Helium (He)
- ❖ Least Penetrating power

7. What is the Alpha Particles ?

- It consist of 2 proton and 2 Neutron
- Most mass all the three radiation
- Most Ionization
- Least Penetration (Paper)

8. What is the Beta Particles ?

- It's like electron
- Written As $-1B$
- Mass less then Alpha Particles
 - Less than Ionization alpha
 - More penetration Than Alpha

9. State The Gamma Particles?

- ❖ Gamma is electromagnetic wave

- ❖ *Small wave length*
- ❖ *Gamma No Charge*
- ❖ *Gamma has no mass*
- ❖ *Most Penetration Power (1m of Concrete)*

10. What is the Isotopes ?

✓ *are atoms of same element which have same atomic number But Different mass number*

11. What is the Isobars ?

- ✓ *Are atoms of different elements which have same mass number*

12. What is the decay ?

- ✓ *Unstable Nuclei decays more frequently than with greater stability*

13. What is the Radioactive Decay ?

- ✓ *Is Break down of An unstable Nuclei*

Types of Radiation	Alpha particle	Beta Particle	Gamma particle
<i>Nature of Radiation</i>	<i>Nucleus of Helium</i>	<i>High speed of electron</i>	<i>Electromagnetic wave</i>
<i>Relative charge</i>	+2	-1	0
<i>Speed</i>	<i>Up to 10% of speed of light</i>	<i>Up to 90% of the Speed of light</i>	<i>Speed of light</i>
<i>Ionizing effect</i>	<i>Strong</i>	<i>Weak</i>	<i>Very weak</i>
<i>Effects of Fields</i>	<i>Deflected by Fields</i>	<i>Deflected by Filed</i>	<i>Not deflected</i>
Penetrating power	<i>Not very penetrating</i>	<i>Penetrating</i>	<i>Very penetrating</i>

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14. Explain Nuclear Equations ?

- ✓ In Nuclear changes just as chemical change nothing is very lost or gained

Remember

_____ in Any Nuclear equation .the Total mass number and Atomic on the **LHS** must equal to the total mass number and Atomic on the **RHS**.

15. What is the Effects on the Nucleus ?

Alpha decay

- In an alpha decay the Atomic number **Z** of the Nucleus goes Down By **2** and the mass number

Beta Radiation

- A beta Particles is an Electron when an Electron is rejected from the Nucleus

Gamma Emission

- Gamma rays Radiation . The Emission of alpha or Beta Particles from nucleus. Leaves the protons and Neutron in An "**Excited**" arrangement

16. What is the Process stable Nuclide is formed ?

- The Process Is Called **decay Series**

17. What is the Nuclides ?

- ✓ Are Atoms which have different Nuclei .whether the difference is the number of protons , and the Number of Neutrons Or Both

18. What' is the Radioactive decay ?

- Is the Process by which Unstable Nucleus Breaks down or disintegrate releasing radiation

19. Note ____ Radioactive is measured in (Bq)

1Bq = 1 nuclear disintegration per Second

- ✓ An Older unit Of Radioactive was the Currie (Ci). Currie is very large unit (**1Ci = 3.7×10¹⁰ B q**) so quantities of Ci and Mci range are used

20. Here we classify the Different Nuclides have different half lives as shown in the table below

Element	Half life
Uranium	4500×10 years
Plutonium	24000 years
Carbon	5600 years

1)List five the Radiation detectors?

- Photographic Film
- Ionization detector
- spark counter
- cloud chamber
- Scintillation detector

2)what contains spark counter?

>This contains

- a positively charged grid
- negatively charged plate

3)state Einstein predicated?

● Einstein predicated that if the Energy of the body changes by the amount E , it's mass changes by an amount M given By the Equation " $E=MC^2$ "

4)What is the moderators?

● the moderators is neutron absorbing rods that controlled the reaction rate

5) What are the two types of nuclear reactions?

●Nuclear Fusion

●Nuclear Fission

6) What is the Nuclear Fusion?

●Is the combination of two light nuclei to form a heavier nucleus

7)What is the Nuclear Fission?

●Is the splitting of a heavy nucleus into nuclei with smaller masses

8) List the Nuclear Fission differs from early nuclear reaction?

●The nucleus is deeply divided into larger fragments of equal masses

●The mass decreases or Q value is appreciable

●Other neutrons called Fission neutrons are emitted in the process which in turn split other nuclei

9)List Six applications of Radio activity?

●As a thickness gauge

●As a tracers

●Radio Therapy

●Radio dating

●As a energy resource

- *Smoke detector*

10) *What is Cobalt-60?*

- *Is Strong gamma emitter*

11) *who is Use Radio dating?*

- *Use Archaeologists to pinpoint the age of ancient materials*

12) *List Three Hazards Of Radio Activity?*

- *It can destroy cells and tissues*
- *It can also changes the DNA, causing mutations and affect the Future generation if the Sex cells are effected*
- *Radiation can cause skin burns and cancer*

13) *How To reduce Hazards from the radioactive material?*

- *People should be shielded from radioactive source by suitable absorber*
- *Radioactive Substance should be kept in thick lead boxes*
- *Minimize time spent near radiation source*
- *Never eat or drink in the lab*

QUESTIONS AND ANSWERS ABOUT

Electromagnetic induction

Q1: *define the Electromagnetic induction?*

Ans: *process which in electric currents are induced Ina conductor by magnetic field*
a

Q2: *what are the types of Electromagnetic induction?*

Ans: they are

1: generator effect

2: mutual induction

Q3: how many ways induced current or electromotive force?

Ans: they are

- By relative movement of the wire and a magnet
- By changing magnetic field

Q4: what is the generator effect?

Ans: is the one way producing electricity by using relative motion b/w magnet and complete wire

Q5: state the three ways of induced E. M. C?

Ans: they are

- Increasing number of turns
- Increasing speed
- Increasing strong magnet

Q6: state two ways of reversing the direction of induced current?

Ans: they are

- ✓ Reversing the polarity of magnet
- ✓ Reversing the direction of motion

Q7: how we can determine the direction of induced current?

Ans: by using Fleming right hand rule(dynamo rule)

- ✓ The first finger points the direction of the field
- ✓ The second finger points the direction of the current
- ✓ The thumb points the direction of the motion

Q8: how we can found the magnitude of induced?

Ans: $E. M. F = BLV$

$E. M. F =$ voltage

$B =$ m. field

$L =$ length

$V =$ speed

Q8: state the Faraday's law?

Ans: Faraday's law states that: the size of the induced e. M. F is proportional the rate of change of Flux linkage

Q9: state the Lenz's law?

Ans: Lenz's law states that the induced current always flows in the direction that opposes the change producing it

Q10: who discovered the Lenz's law?

Ans: discover by a Russian Heinrich Lenz

Q11: what are the application of Electromagnetic induction?

Ans: they are

- ✓ Generators
- ✓ Record player pick up
- ✓ A Moving coil microphone
- ✓ A play back of cassette recorder

Q12: what is the generator?

Ans: A generator is advice that converts mechanical energy into electrical energy

Q13: list the types of generator?

Ans: they are

- ✓ AC generator (AC dynamo)
- ✓ DC generator (DC dynamo)

Q13: what is the mutual induction?

Ans: A mutual induction is the change in magnetic field of one coil which induces a current in the other coil

Q14: state ways of increasing the magnitude of e. M. F induced in the second coil?

Ans: they are

- ✓ By having more turns on secondary coil turns
- ✓ Winding in the primary and the secondary coils on a soft iron core
- ✓ Winding the secondary coil on the primary coil

Q15: state one way reversing the direction induced current?

Ans: by using the direction of current in the first coil

Q16: when occurs the mutual induction?

Ans: mutual induction occurs if and only if there is a field change in one of the coils

Q17: state the ways the current in the first can change?

Ans: can be changed

- ✓ By switching the current on and off
- ✓ By varying the current causing a rheostat
- ✓ By applying an AC in the first coil

Q18: what is the application of mutual induction?

Ans: transformers

Q19: define transformers?

Ans: transformer is a device which makes use of mutual induction to change the magnitude of the voltage

Q20: state the function of the transformer?

Ans: the function of transformer is to increase or decrease the potential difference of an alternating current supply

Q20: what are the transformer consist?

Ans: consist the coils

- ❖ Primary coil: carries input voltage or current
- ❖ Secondary coil: carries out put voltage of current
- ❖ Iron core: provides low resistance path to the flux

Q21: what are the types of transformer?

Ans: they are two types

1: **step up transformer:** input voltage is less than output voltage and number of the turns in the primary coil is less than the number of turns in the secondary coil

2: **step down transformer:** input voltage is greater than output voltage and the number of the turns in the primary coil is more than the number of turns in the secondary coil

Q22: what is the power loss in a transformer?

Ans: in practice the output power of a transformer is always smaller than the input power of the transformer due to the energy loss in the transformer heat

- ❖ Input power = output power

Q23: what causes the power lost in transformers?

Ans: most of the energy lost in transformers is lost as heat and is created by one of the following ways

1: resistance of the winding

- 2: eddy current
- 3: leakage of field lined
- 4: hysteresis lost

Q24: what is the electrical power transmission?

Ans: **electrical power** is transmitted by power lines over large distance from power stations to the consumers

Q25: what are the problems involving electricity transmission?

Ans: they are

- 1: power loss during transmission
- 2: the high voltage transmission cable
- 3: the cost of the cables in high
- 4: charge leakage may happen between cables and earth
- 5: pylons may be struck by lightning
- 6: pylons and cables may be struck by light aircraft

Q26: what is a national grid network?

Ans: a national grid network is a network of cable that connects all the power stations in a country to transmit electricity to the consumers throughout nation

Q27: what is the advantage of the national grid network?

Ans: they are

- 1: reduces power lost during transmission
- 2: electricity supply is more stable and reliable
- 3: electric current can be distributed to difference users according voltage
- 4: maintenance and repair work can be done at any time

QUESTION AND ANSWER ABOUT TELECOMMUNICATIONS

1. What is the Telecommunication?

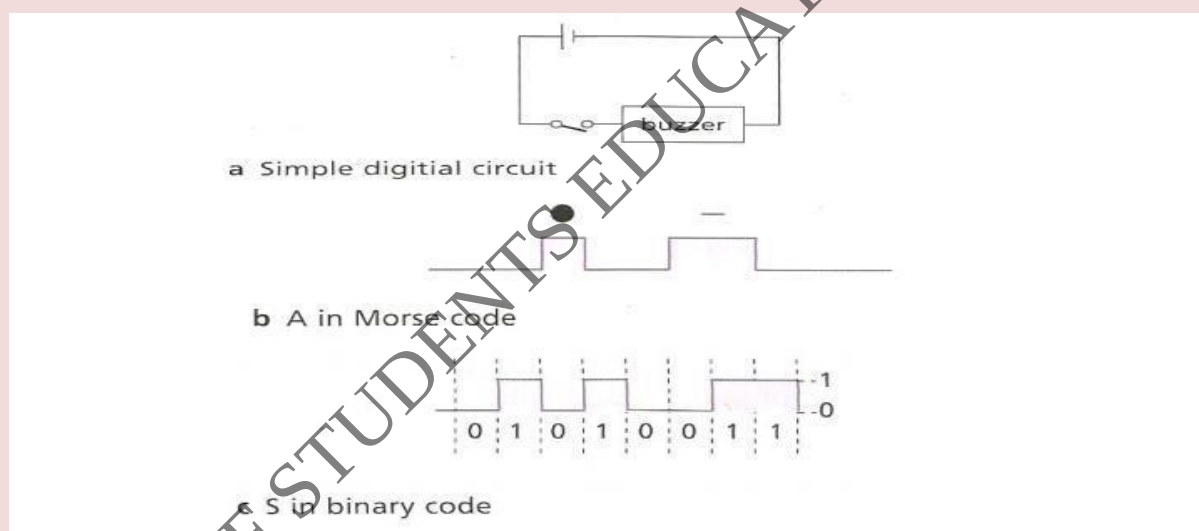
- Telecommunications is concerned with sending and receiving information over a distance.

2. What is the Telegraph?

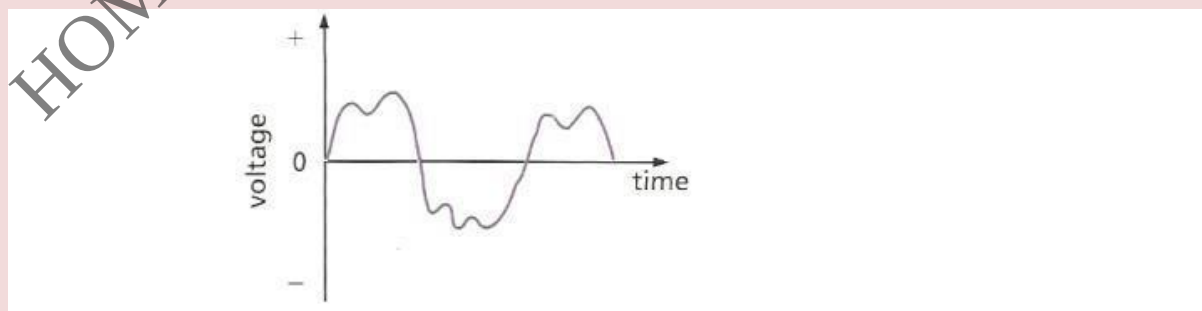
- Telegraph messages were sent in Morse code as currents in cables.

3. list two ways of Representing information?

- Information can be represented electrically in two ways
 - **Digital method** :- electricity is switched on and off and the information is in the form of electrical pulses.



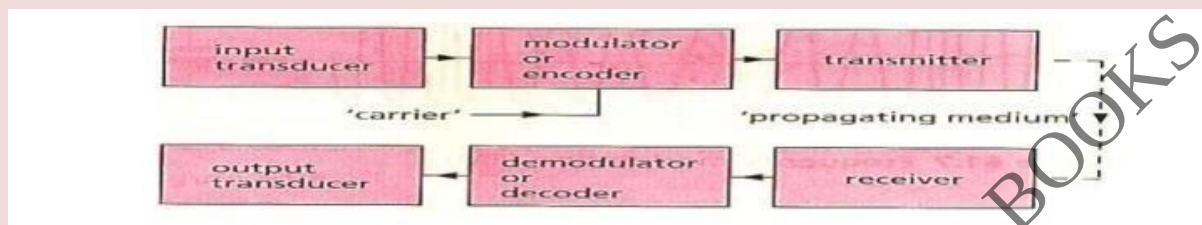
- **Analogue method** :- in this the information is changed to a voltage or current that varies continuously and smoothly over a range of values



4. Explain basic communication system?

- Electrical signals representing 'information' from a microphone, a television camera, a computer act.

5. the basic building blocks of any communication system are shown in figure.



6. What is the Radio waves?

- Radio waves are member of the family of electromagnetic radiation.

$$v = f\lambda$$

7. Explain surface or ground waves?

- These follow the earth's surface have a limited range. Being greatest (1500 km) for long waves but much less for **VHF**.

8. Explain sky waves?

- These travel skywards and if they are below a certain **critical frequency** (typically 30 MHz) are returned to earth by bouncing off the ionosphere.

9. Explain the space waves?

- These gives straight-line transmission over 100 km or so on Earth in the absence of intervening obstacles such as hills and building, and the way **VHF, UHF and** microwave travel.

10. Explain Radio system?

- Radio waves are emitted by aerials when a.c. flows in them but the length of the aerial must be comparable with the wavelength of the wave produced for the radiation to be appreciably.

11. What are types of Radio system?

- ❖ Transmitter
- ❖ Receiver

12. Explain electrical oscillation?

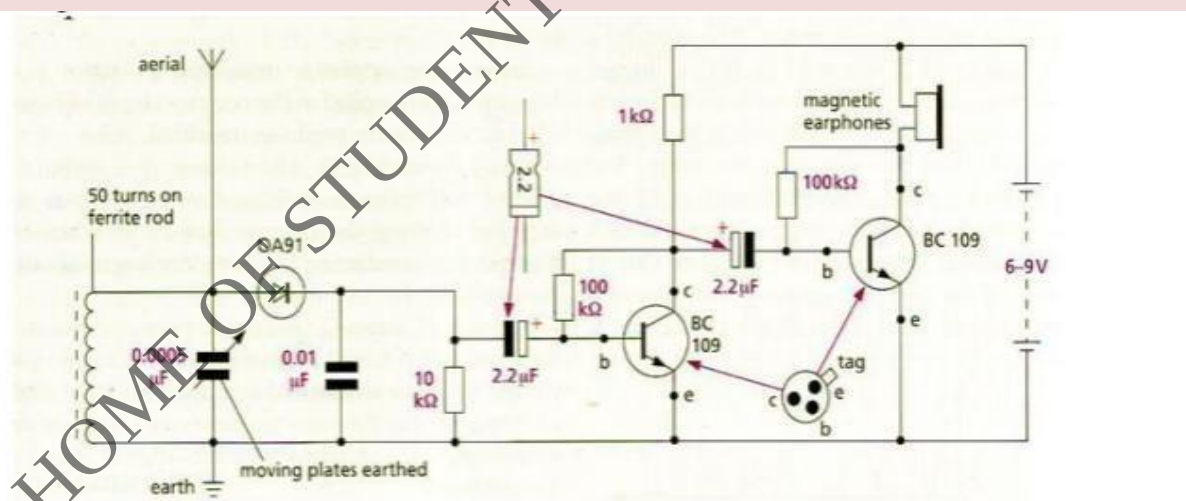
- Production of r.f. current is impossible with mechanical generators but is readily achieved electrically by using an oscillatory circuit.

13. What is the turning Circuit?

- Different transmitting stations send out radio waves of different frequencies.

14. What is the detection or demodulation?

- Detection or demodulation the r.f. which was added to the r.f. in the transmitter is recovered in the receiver.

15. simple Radio Receiver.

Connect the circuit of figure on an S-DeC, figure the transistor leads can be lengthened and connections made to the 'tags' on the variable capacitor.

16. What is the Television?

- The television receiver is basically a **CRO** with two time bases.

Black and white: the horizontal or line time base acts as in the **CRO**. The vertical or **frame time base** operates at the same time and draws the spot at a much slower rate down to the bottom of the screen and then returns it almost at once to the top.

Color: one type of color television has three electron guns and the screen is coated with about a million tiny light emitting dots arranged in triangles.

Energy transfers: electrons emitted by an electron gun in the cathode ray tube of a television receiver or a **CRO** are accelerated towards the screen by the high p.d.

$$\text{k.e.} = \frac{1}{2} mv^2 = eV$$

17. What is the raster?

Ans. Is the spot thus draws a series of parallel lines of light which covers the screen.

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