PHYSICS 2019

Time: 30 Minutes **Max. Marks: 19**

SECTION "A" (MULTIPLE CHOICE QUESTIONS) 1.

Choose the correct answer for each from the given options: (19)

1. Unit of light intensity is:
   - Pascal • Volt • Candela • Joule
2. The circumference of earth was determined by:
   - Mohd. Bin Musa Al-Khwarzami • Al-Beruni
   - Yaqub Al Kindi • Abu Ali Hassan lbn-Al-Haitham
3. In British Engineering system 1 horsepower (hp) =
   - 560 ft.lb/s • 505 ft.lb/s • 550 ft.lb/s • 546 ft.lb/s
4. It is a vector quantity:
   - Distance • Displacement • Speed • Mass
5. Archimedes principle is used to determine:
   - Specific gravity • Specific heat
   - Specific resistance • Specific radiation
6. The concave lens is used:
   - for the correction of Short sightedness • Aberration
   - for the correction of long sightedness
   - for clear picture
7. Artificial satellites the necessary acceleration is provided by:
   - Gravitational force • Frictional force
   - Coulomb's force • Centrifugal force
8. A form of disturbance which travels through a medium due to periodic motion of particle medium about their mean position is called:

   • Time period • Resonance • Frequency • Wave motion
9. If 1 1.5 amp, R = 10 ohm then the voltage (V) is:
   - 10 volts • 1.5 volts • 150 volts • 15 volts
10. The rate of change of velocity is called:
    - Torque • Acceleration • Momentum • Speed
11. Shunt Converts a Galvanometer into:
    - a Voltmeter • an Ammeter
    - a Wattmeter • a Calorimeter
12. The unit of coefficient of friction is:
    - Newton • Kilogram • Metre • None
13. An inclined plane 5 m long has one end raised by 1 m its mechanical advantage will be:
    - 15 • 5 • 1/5 • 1/15
14. If two parallel forces have the same directions they are called:
    - Unlike parallel forces • Couple • Rectangular forces •Like parallel forces
15. The temperature of a substance changes from — 20°C to 20°C then the temperature change in Kelvin's scale is:
    - Ok • 20K • 40K • 293K
16. Small drops of rain water dispese sun light into different colors is called:
    - Dispersion • Interference
    - Rainbow • Spectrum
17. Amplification can be obtained by:

- Radar • Transistor • P.N. Junction • Capacitor

18. The image found in a plane mirror is:

- Real • inverted • virtual and erect • real and inverted

19. Which of the following is more penetrating?

- $\propto$ — rays • β - rays • γ - rays • X — rays

PHYSICS 2019

Time: 2 1/2 Hours **Max. Marks; 66**

SECTION "B" (SHORT-ANSWER QUESTIONS) (40)

PART_A' NOTE: Answer 5 questions from this part.

2. Write down two contributions of each scientist:
   (i) Yaqoob Al-Kindi (ii) Abu-Al-Haitham
3. What-are transistors? Write its two types with the help of circuit diagram.
4. Define: (I) Viscosity (ii) Surface tension
   (iii) Centre of gravity (iv) Couple
5. Stare Newton's Second Law of Motion and derive F = ma
6. Describe briefly any four electromagnetic waves with their ranges.
7. State Joule's law and derive equation $W = I^2 Rt$
8. Write down two differences between:
   (i) N-type substances and P-type substances
   (ii) Fundamental quantities and derived quantities.
9. Give scientific reason:
   (i) Why is sliding friction greater than rolling friction
   (ii) Why is an ammeter, low resistance connected in parallel with the coil of a galvanometer?

PART 'B' NOTE: Answer 5 questions from this part.

10. How much energy will be released when 50 gm of mass is completely transformed to energy?
11. When a sound wave of frequency 200 Hertz and wave length 300 cm passes through a medium calculate the velocity of the wave in the medium.
12. Calculate the orbital velocity of artificial satellite required moving around the earth if radius of earth is 6×10^6 m and the value of 'g' is $10m/sA^2$.
13. A force is acting at an angle 60° with x-axis. If the x-component of the force in 50 Newton. Find resultant force and y-component of the force. (Sin 60° = 0.866, Cos 60° = 0.5)
14. Find the amount of heat required to raise the temperature of 100 gm of water from 10°C to 60°C. (Sp. Heat of water = 4200 J/Kg°C)
15. A ball is dropped from a tower it reaches the ground in 10 seconds. Calculate the height of the tower and the velocity with which it hits the ground?
16. The focal length of a Concave mirror is 15cm, where should an object be placed so as to get its real image magnified thrice (three)?
17. An electronic heater has a resistance of 20 Ohm, woris at a potential difference of 220 volts. Find the current passing through the heater and the power.

SECTION 'C' (DETAILED ANSWER QUESTIONS

Note: Answer any Two questions from this Section. 18.

(a) Define Boyle's and Charle's Law and derive the general gas equation. PV = nRT

(b) Name two main defects of Human Eye. Describe with the help of ray diagrams show the defects and their correction.

19.(a) What are simple electric motors? Write down its construction and working with diagram.

(b) What is wheel and axle? With the help of a labeled diagram calculate its mechanical advantage.

20.(a) Define Potential and Kinetic Energy, also derive their equation: P.E. = MGH and K.E. = $^1/_2$ mv^2

(b) Define Simple Harmonic motion and prove that the motion of a body attached to the end of spring execute simple harmonic motion.

PHYSICS 2018

Time: 30 Minutes **Max. Marks: 19**

SECTION "A" (MULTIPLE CHOICE QUESTIONS) 1.

Choose the correct answer for each from the given options: (1 9)

1. Laser is belongs to:
   - Nuclear Physics • Atomic Physics
   - Solid-state Physics • Astro Physics
2. In Uranium isotope $_{92}U^{238}$ is the number of Neutron is:
   - 9 2 • 146 • 238 • 330
3. Kg m/s is same as:
   - N.s • N/s • N.m • N/m
4. The product of mass and acceleration is called:
   - Momentum • Force • Work • Torque
5. A 25 N force acts along the x-axis, its y component is:
   - 25N • -25N • O N • 5 N
6. If a body is moving with uniform velocity it is said to be in:
   - Neutral equilibrium • Dynamic equilibrium
   - Static equilibrium • Unstable equilibrium
7. One horse power = --------- watt:
   - 746 • 550 • 674 • 505
8. The rate of work doing is called:
   - velocity • acceleration • power • momentum
9. The mechanical advantage of a movable pulley is:
   - 1 • 2 • 3 • 4
10. The formula for volume of sphere is:
    - $\pi r^3 \ell$ • $\pi r^2 \ell$ • $4/3\ \pi r^3$ • $3/4\ \pi r^3$
11. When water is changed into ice, it:
    - expands • contracts • becomes lighter • becomes heavier
12. In an elastic spring, simple harmonic motion is produced due to: • restoring force
    - K.E. of spring • Weight of spring • mass of spring
13. The image formed in a plane mirror will be:

- real • inverted • virtual and erect • real and iverted

14. Optical fiber is the paractical application of:

- Polarization • Refraction
- Interference • Total internal reflection

15. Electromagnetic waves carries:

- Wavelength • Frequency • Charge • Energy

16. Coulomb per volt is called:

- Ampere • Ohm • Farad • Watt

17. The relation between electric current and magnetic field was discovered by:

- Newton • Faraday • Oersted • Fleming

18. The emission of rays from the nucleus is called a/an:

- Chemical process • atomic process
- radioactivity • atomic dispersion

19. 1 micro coulomb = ------ coulomb:

- 10^{-6} • 10^{-3} • 10^{-9} • 10^{-12}

PHYSICS 2018

Time: 2 1/2 Hours **Max. Marks: 66**

SECTION "B" (SHORT-ANSWER QUESTIONS) {40)

PART 'A'

NOTE: Answer 5 questions from this part.

2 Define: (i) Doping (ii) Mechanics (iii) Friction (iv) Personal error

3. Give scientific reason:

(i) It is dangerous to jump from a fast moving vehicle

(ii) Aquatic animals survive in frozen seas.

4. State Newton's 2nd Law of Motion and derive F = ma.

5. How is a Galvanometer converted into an Ammeter and a Voltmeter? Also draw relevant diagrams.

6. State Coulomb's Law. Write down its equation. Mention the value of K in S.I. units.

7. State two differences between:

(i) mass and weight

(ii) fission reaction and fusion reaction.

8. Write the name of the law, which states "When a pressure is applied to a liquid it is transmitted equally in all directions." Describe any one application of this law.

9. What is Radar? Write down its three uses.

PART 'A'

NOTE: Answer 5 questions from this part.

10. The radius of a Hydrogen atom is 0.53×10^{-10} m. Convert it is kilometer, millimeter, micrometer and nanometer.

11. A ball is dropped from a height of 122.5 m. How muchtime will it take to reach the ground?

12. What is the pressure of 200 moles of a gas in a $50 m^3$ cylinder at 27°C?

13. Two resistances of 4Ωand 6 fΩare connected in parallel and then joined to a source having an e.m.f of 12 V. Find the value of equivalent resistance of the circuit and the total current flowing it the circuit.

14. An object of weight 50N is raised 2m above the ground

using an inclined plane of length 10m. Calculate the effort applied parallel to the inclined plane. Also, find the mechanical advantage of the inclined plane.

15. Two bodies of masses 5 Kg and 4 Kg are attached to the ends of a string that passes over a pulley such that the two bodies hang vertically. Find the acceleration of the bodies and tension in the string.

16. The focal length of a convex lens is 18cm. An object 5cm high is placed at a distance of 12cm from the lens. Determine the position, nature and the height of the image.

17. A piece of paper completes 600 vibrations in 60 seconds when some waves pass through the surface of water. Find the time period and the frequency of the piece of paper. Calculate the wave length if the velocity of the waves is 2.5m/s.

SECTION 'C' (DETAILED ANSWER QUESTIONS)

Note: Answer any Two questions from this Section.

18.(a) Define K.E. and P.E. Derive the equation K.E = $^1/_2$ mv^2,

(b) Define resolution of a vector. Explain the method to resolve a vector into its rectangular components.

19.(a) Define Co-efficient of linear expansion and derive the relation $L_2 = L_1 [1 + a\Delta T]$

(b) Define simple harmonic motion and prove that the motion of a simple pendulum is simple harmonic motion.

20.(a) With the help of a ray diagram derive the mirror equation $\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$

(b) State the Law of Universal Gravitation. Prove that

$$M_e = \frac{g{R_e}^2}{G}$$

PHYSICS **2017**

Time: 30 Minutes **Max. Marks: 17**

SECTION "A" (MULTIPLE CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options: **(17)**

1. A micro meter is equal to:

a. 10^{-6}m
b. 10^{-9}m
c. 10^{10}m
d. 10^{12}m

2. The freely falling bodies' value of 'g' is:

a. 4.9 □/□^{2}
b. 9.8 □/□^{2}
c. 19.6 □/□^{2}
d. 39.2 □/□^{2}

3. Refractive index of glass is:

a. 1.52
b. 1.33

c. 2.42
d. 1.64

4. Kg. □/□² is the unit of:
a. Power
b. Weight
c. Pressure
d. Momentum

5. Boiling point of pure water is:
a. 0k
b. 273k
c. 373k
d. 227k

6. One horse power is equal to:
a. 450 watt
b. 746 watt
c. 550 watt
d. 476 watt

7. The radius of curvature of a concave mirror is 20cm its focal length will be:
a. 40cm
b. -40cm
c. 10cm
d. -10cm

8. In nuclear reactor control rods are of:
a. Carbon
b. Boron
c. Aluminum
d. Sodium

9. The value of 'G' was determined experimentally by:
a. Newton
b. Cavendish
c. Galileo
d. Pascal

10. N-Type material is formed when semiconductor is doped with element:
a. Divalent
b. Trivalent
c. Tetravalent
d. Pentavalent

11. Rain drops are spherical in shape because of this property of water:
a. Density
b. Viscosity
c. Pressure
d. Surface tension

12. Loudness of sound depends upon:
a. Amplitude
b. Frequency
c. Wave length
d. Velocity

13. Kitabul Manazir is written by:
a. Al-Baruni
b. Yaqoob Al-Kindi
c. Ibn-ul-Haitham
d. Moosa Al-Khwarzami

14. It is not a vector quantity:
a. Momentum
b. Weight
c. Pressure
d. Torque

15. The mechanical advantage of moveable pulley is:
a. 2
b. 3
c. 4
d. 5

16. Kilo-watt hour is the commercial unit of:
a. Power
b. Electrical Energy
c. Time
d. Velocity

17. The lightest particle is an atom is:
a. Neutron
b. Electron
c. Deuteron
d. Proton

Time: 2.5hours **Max. Marks: 68**

SECTION "B" (SHORT-ANSWER QUESTIONS)(42)

NOTE: Answer 14 questions from this section.

2. Define Physics and write the names of any of its four branches
3. Write down the S.I units of the following physical quantities:
   a) Time
   b) Weight
   c) Power
   d) Stress
   e) Length
   f) Frequency

4. State Newton's laws of motion.
5. A car starting from rest attains a velocity of 20□□$^{-1}$ in 5 seconds. Find the distance covered by the car.
6. Define wave length, time period and frequency.
7. Write three states of equilibrium.
8. Define:
   a) Nuclear Fission
   b) Rectifier
   c) Half life of an element

9. A steel rod has a length of 10 meters at a temperature of 25°C. Calculate the increase in length if it is heated to 35°C, For Steel (α =1.1 x 10^{-5} □$^{-1}$)
10. Write Newton's corpuscular theory of light.
11. A car is moving in a circular track of radius 30m at a constant speed of 20 m/s, Find the centripetal acceleration of the car.
12. Define Primary cell and write its four examples.
13. Find the resistance of an electric bulb if 0.60 A current is passing through it and the potential difference across the bulb is 90V.
14. Define pressure. Write its formula and S.I unit.
15. What is Bimetallic Strip? Write the name of its two applications.
16. What is the Kinetic Energy (K.E) of 2000kg car travelling at a velocity of 90km/h?

17. State the laws:
   a) Charles's Law
   b) Coulomb's Law
   c) Ohm's Law.

18. With the help of diagram define negative of a vector and resultant vector.
19. Write down three differences between forward blazed and reverse blazed.
20. Calculate the distance of object from a convex lens having a focal length of 15cm if the magnification in 3 and the image in real,
21. Calculate the length of second's pendulum – Taking 'g' equal to 10□/□^{2}. (Second's pendulum has a time period of 2 second)
22. In a nuclear reaction 9.0 x 10^{10} J of energy is released due to conversion of mass intro energy. How much mass has been converted to energy?

SECTION 'C' (DETAILED ANSWER QUESTIONS)

NOTE: Answer any TWO questions from this section.

23. **(a)** Derive the equation: $S = Vit + \frac{1}{2}\square\square^2$.
    (b) What is inclined plane? Calculate its Mechanical Advantage.
    (c) Write four properties of Alpha rays.

24. **(a)** Write the construction and working of electric bell with diagram.
    (b) What is radar? Write its three uses.
    (c) Write four uses of spherical mirrors.

25. **(a)** Two bodies of different masses are attached with a string which passes over a friction less pulley such that the bodies are moving vertically. Derive the formula:
$$\alpha = \left(\frac{\square_1 - \square_2}{\square_1 + \square_2}\right)g.$$
    (b) Draw a ray diagram of an astronomical telescope and describe to working,
    (c) Define musical sound and write its three characteristics.

PHYSICS 2016

Time: 30 Minutes **Max Marks: 17**

SECTION "A" (MULTIPLE CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

1. 1 micro gram =
a) 10^{-3}kg
b) 10^{-6}kg
c) 10^{-9}kg
d) 10^{-12}kg

2. If the speed of a body moving in a circle is doubled, its centripetal acceleration becomes:
a) Twice
b) Four Times
a. Eight Times
b. Three Times

3. Which is the best approximation of the weight of an object of mass 800 gram?
a. 88 N
b. 80 N
c. 8 N
d. 0.8 N

4. Specific heat of ice is:
a. 4200 $\square\square\square^{-1}\square^{-1}$
b. 2100 $\square\square\square^{-1}\square^{-1}$
c. 4300 $\square\square\square^{-1}\square^{-1}$
d. 4100 $\square\square\square^{-1}\square^{-1}$

5. The work will be negative if the angle between force and displacement is:
a. 90°
b. 180°
c. 0°
d. 45°

6. If q=6 cm and p=3 cm then the magnification of the mirror is:
a. 4
b. 2
c. 3
d. 12

7. If P type substance the charge carrier are:
a. Electron
b. Proton
c. Holes
d. Neutron

8. To measures current in a circuit, an ammeter is always connected:
a. In series
b. In parallel
c. In any way
d. None of these

9. It is a scalar quantity:
a. Torque
b. Frequency
c. Electric Intensity
d. Momentum

10. X-Rays wave length ranges from:
a. 0.1 nm to 0.01 nm
b. 1.0 nm to 0.01 nm
c. 0.1 nm to 0.001 nm
d. 1.0 nm to 0.1 nm

11. Nucleus of this atom is called α – particle:
a. Helium
b. Uranium
c. Polonium
d. Radium

12. A cone standing on its base is an example of this type of Equilibrium:
a. Stable
b. Neutral
c. Unstable
d. Kinetic

13. Orbital Velocity of a satellite near the surface of the earth is:
a. 9270 km/s
b. 9720 km/s
c. 7920 km/s
d. 7290 km/s

14. Which one has maximum elastic limit?
a. Crown glass
b. Steel
c. Iron
d. Brass

15. The minimum distance between sound and barrier for distinct echo is:
a. 17 m
b. 20 m
c. 23 m
d. 27 m

16. Which one has maximum index of refraction?
a. Water
b. Glass
c. Diamond
d. Air

17. It is a device which converts electrical energy into mechanical:
a. Electric Generator
b. Solenoid
c. Electric Motor
d. Electric Coil

Time: 2.5 Hours Max. Marks: 68

SECTION "B" (SHORT-ANSWER QUESTIONS)(42)

NOTE: ANSWER 14 QUESTIONS FROM THIS SECTION.

2. Write down three difference between heat & temperature
3. A ball is dropped from a tower; it reaches the ground in 10 seconds. Calculate the height of the tower**. (Take g=10 □/□²)**
4. Compute the gravitational force of attraction between two boys of masses 50kg and 40kg respectively apart from each other by **2 m. (G = 6.67 x □□⁻□□ □. □² /□□²)**
5. Define Irregular reflection of light and also write two points of its importance.
6. With the help of rectangular components of a vector derive the equation for the resultant vector

$$F = \sqrt{□□^{□} + □□^{□}}$$

7. The focal length of a concave mirror is 10 cm where should an object be placed so as to get its real image magnified 4 times.
8. State the following laws:
a) Hooke's Law
b) Snell's Law
c) Boyle's Law
9. Define power and derive the equation **P=FV**.
10. Describe quantum theory of light and explain dual nature of light.
11. Write two uses of radioisotopes in medicine and one use in industry.
12. Calculate the current of electric heater. If 1800 coulomb charge passes through it in 3 minutes.
13. With what constant velocity can a 1960 watt motor raise a mass of 100 kg?
14. Define **(i)** Interference **(ii)** Stationary waves **(iii)** Beats
15. State principle of lever and derive formula for mechanical advantage of lever.
16. Write down three precautions to minimize the radiation hazards.
17. Half life of .□□ □□□□ is 8 days. Find the amount of iodine left after 16 days from a sample of 100gm.
18. Find the time period of a simple pendulum whose length is 288 cm.
19. Define anomalous expansion of water and give its two effects.
20. Define equilibrium and state two condition of equilibrium.

21. Calculate the volume occupies by 2 moles of a gas at 27°C & pressure of **1 atm = 1.01x** □□□ □/□□ **(R=8.314J/mol-k)**

22. Define orbital velocity and derive the formula **V** = √□□□/□

SECTION 'C' (DETAILED ANSWER QUESTIONS)

Note: Answer any two questions from this section.

23. **(a)** Derive the equation: **β = 3α**

(b) State Newton's law of gravitation and describe the formula for mass of earth with its help.

24. Define the following:

a) Power of lens
b) Nuclear Reactor
c) Half life of an element
d) Dispersion of light

25. **(a)** Derive the equation **2as** = □□ - □□

(b) Define Pascal's law and explain any one of its application by diagram.

26. Write two differences between the following:

a) Longitudinal waves and transversal waves
b) Fission Reaction and Fusion Reaction

27. **(a)** Derive Ray diagram of Compound Microscope and describe it working.

(b) Write four similarities of static Electricity & magnetism.

(c) Write down two advantages and two disadvantages of Friction.

PHYSICS 2015

Time: 30 Minutes **Max. Marks: 17**

SECTION 'A' (COMPULSORY)(M.C.Q.)

1. Choose the correct answer for each from the given options:

1. The only Noble Prize holder scientist from Pakistan is:
a) Dr. Abdus Salam
b) Dr. Abdul Qadeer Khan
c) Dr. Atta ur Rehman
d) Dr. Saleem Us Zaman

2. The least count of screw gauge is:
a) 0.001cm
b) 0.1cm
c) 0.01cm
d) 0.0001cm

3. The SI unit of force is:
a) Meter
a) ms^{-1}
b) kg
c) Newton

4. A vector quantity is:
a) Density
b) Velocity
c) Temperature
d) Distance

5. The turning effect of a force about an axis is:
a) Force
b) Rotation
c) Torque
d) Momentum

6. In case of satellites the necessary acceleration is provided by:
a) Frictional force
b) Gravitation force
c) Coulomb's force
d) Magnetic force

7. 1 hp=
a) 467 watts
b) 647 watts
c) 746 watts
d) 764 watts

8. For an ideal machine efficiency is:
a) 1
b) 2
c) 3
d) 4

9. Elasticity of a substance depends on its:
a) Temperature
b) Size
c) Mass
d) Nature

10. The temperature of a substance change from -20°C to 20°C. What is the temperature change in Kelvin's scale?
a) 0 K
b) 20 K
c) 40 K
d) 293 K

11. The waves produced by a vibration body in air are:
a) Longitudinal
b) Transverse
c) Electromagnetic
d) Magnetic

12. If the Inner surface of a spherical mirror is reflecting it is called:
a) Plane mirror
b) Convex mirror
c) Concave mirror
d) Ordinary mirror

13. Refractive index of common salt (Sodium Chloride) is:
a) 1.33.
b) 1.52
c) 1.53
d) 1.54

14. When a ray of light enters obliquely from a rarer into a denser medium the angle refraction becomes angel of incidence:
a) Greater than
b) Smaller than
c) Equal to
d) Unrelated to

15. To disperse white light into different colors we use:
a) Convex lens
b) Prism
c) Concave mirror
d) Convex mirror

16. One mega ohm resistance is equal to:
a) 10^8 ohm
b) 10^6 ohm
c) 10^{-6} ohm
d) 10^{-9} ohm

17. The half life of Radon .□□ □□□□ **is:**
a) 3.83 days
b) 38.3 days
c) 3.38 days
d) 8.33 days

Time: 2.5 Hours Max. Marks: 68

SECTION 'B' (SHORT-ANSWER QUESTIONS)

Note: Answer 14 questions from this section.

2. Name and define branches of physics about solid material, nucleus of atoms and astronomical bodies.
3. Write the approximate value of mass of our galaxy, earth and moon.
4. A car is moving with uniform acceleration and attains the velocity of **108** □□□$^{-□}$ in 5 minutes. Find acceleration of the car.
5. Write three points of comparison between weight & mass
6. With the help of graphical method add two vectors $\bar{A}$ and $\dot{B}$.
7. Prove that Moment of the couple is equal to the product of one of the forces and arm of couple.
8. With the help of two bodies mathematically express the law of universal gravitation in three steps.
9. A string 2m long is used to whirl a 100gm in horizontal circle at a speed of 2□□$^{-1}$ find tension in string.
10. Describe inter conversion of kinetic & potential energy.
11. Draw the figure of wheel and axle and calculate its mechanical advantage.
12. Explain Hooky's Law applied to helical spring.

13. A steel rod has a length of 10m at a temperature of 25°C calculate the increase in length if its is heated to **35°C. α (for steel = 1.1 x □□$^{-□}$ □$^{-□}$)**
14. Who invented pin hole camera? Show the image formed by it through diagram.
15. Find the time period of a simple pendulum whose length is 100cm.
16. With the help of Snell's law prove that there is no change in direction of refracted ray if the incident ray is perpendicular on the surface separating the two media.
17. An object is placed 10 cm from a convex lens of focal length 15cm. Find the position and magnification of the image.
18. 18. Compare between Newton's corpuscular theory and Huygens wave theory of light.
19. 19. A parallel circuit contains 80 (ohm) heaters and 20 (ohm) elements. What will be the current passing of 80 volts? Also find the equivalent resistance.
20. 20. Write the name of three elements by which magnets are artificially made by their alloy and also write three modern uses of magnet.
21. What is transistor? Draw the symbolic diagram of two types of transistors.
22. With the help of Einstein equation find the mass transformed to energy when the speed of light is 3 x 10^8 □□$^{-1}$ and the energy released during nuclear reaction is 9 x 10^{16} J.

SECTION 'C' (DETAILED – ANSWER QUESTIONS)

NOTE: Attempt any 2 questions from this section. (26)

23. **(a)** What is Natural Radio Activity? Name three element which emit powerful radiations and write the range of velocity of particles of negative rays emitted during radio activity.
(b) Draw the diagram of electric bell and describe its working.
(c) Describe and derive general gas equation.

24. **(a)** Define simple harmonic motion and describe its five important terms.
(b) Describe Electrostatic induction in four steps with the use of two metal spheres.
(c) Describe four examples showing surface tension.

25. **(a)** Derive second equation of motion in five steps.
(b) With the help of diagram show and explain short sightedness and long sightedness and its correction.
(c) Describe sign convention for real and virtual image.

PHYSICS 2014

TIME: 30 MINUTES Max Marks: 17

SECTION "A" (MULTIPLE CHOICE QUESTIONS)

1. Choose the correct answer for each from the given option:

1) Which one of the following has maximum value of refractive index?
A. Ruby
B. Crown glass
C. Quartz
D. Diamond

2) Production of beats is due to the ..... of sound waves:
A. Interference
B. Reflection

C. Diffraction
D. Refraction

3) The branch of physics concerned with highly ionized atoms is called.....Physics.
A. Atomic
B. Nuclear
C. Plasma
D. Nuclear state

4) The unit co-efficient of fraction (μ) is :
A. Newton
B. Joule
C. Newton meter
D. None of these

5) The waves produced by a vibrating body in air are:
A. Longitudinal waves
B. Transverse waves
C. Electronegative
D. Magnetic waves

6) It always gives virtual image:
A. Concave lens
B. Convex mirror
C. Plane mirror
D. All of them

7) The viscosity of ethanol is:
A. 0.019
B. 0.1
C. 1.000
D. 0.801

8) If frequency of a pendulum is 10HZ, then time period will be :
A. 1sec
B. 10sec
C. 0.1sec
D. 0.01sec

9) Water has maximum density at:
A. 0°C
B. -4°C
C. 4°C
D. 100°C

10) 1 mega meter = ... meters:
A. 10^{12}
B. 10^{9}

C. 10^6
D. 10^{15}

11) If P=15CM, Q=30CM, the, magnification is …….
A. 2
B. 1.5
C. 45
D. 15

12) Latent heat of vaporization of water is:
A. 3.36×10^5 J/KG
B. 2.26×10^5 J/KG
C. 2.26×10^6 J/KG
D. 2.26×10^{-6} J/KG

13) Right hand rule is introduced by:
A. Maxwell
B. Faraday
C. Oersted
D. Ampere

14) Rainbow appear due to:
A. Absorption of light
B. Dispersion of light
C. Refraction of light
D. Reflection of light

15) The mass of our galaxy is:
A. 2×10^{43} KG
B. 2×10^{50} KG
C. 6×10^{26} KG
D. 7×10^{22} KG

16) Which of the following is used for study of thyroid glands?
A. I-132
B. P-32
C. NA-24
D. CD-60

18. Rechargeable cell is called .....cell:
A. Daniel
B. Secondary
C. Primary
D. Voltaic

TIME: 2.5 HOUR'S **MAX. Marks: 68**

SECTION "B" (SHORT –ANSWER QUESTION)

NOTE: Answer 14 question from this section no answer should exceed 3to 5 sentence. (42)

2. Write down S.I.U for the following :
   - **a)** Viscosity
   - **b)** Stress
   - **c)** Torque
   - **d)** Temperature
   - **e)** Input
   - **f)** Momentum
3. How much energy will be released when 20gm mass is completely transferred to energy by Einstein's equation?
4. Prove that**:** □□=□□**+ at O R V=Fλ**
5. Write down three differences between transverse and longitudinal waves.
6. A gun of mass 10kp fires a bullet of mass 0.05 kg with a speed of mass 200 m/s. calculate velocity of recoil of the gun.
7. Derive mechanical advantage formula for inclined plane
8. A 5cm long beam pivoted into a wall, a force of 100 N is applied vertically at the far end of beam. Find the torque produced.
9. Define:
   - **a)** Power
   - **b)** Spectrum
   - **c)** Newton
10. How can we convert a galvanometer into ammeter and voltmeter? (show only by labeled diagrams)
11. Find the amount of heat required to convert 10kg ice 0°C into water without changing the temperature while latent heat of fusion of ice 336000 J/KG.
12. Write down any three differences between alpha and beta rays.
13. Show the image formation and characteristics by convex mirror with the help of ray diagram.
14. The focal length of a convex lens is 20cm. if the image formed by it is twice in size, find the position of the object.
15. Write down difference between forward and reverse biased.
16. Calculate the amount of work done in carrying a charge of **+25 µc A to B is at a potential of -60 v and B is at 10 V.**
17. Define: **(1)** resonance **(2)** inertia **(3)** specific heat
18. Describe any three laws of fusion.
19. Define electric motors and write down two factors on which its speed depends.
20. Two bodies of masses 5kg and 4kg are attached to the ends of a string which passes over a frictionless pulley such that two bodies hang vertically. Find the acceleration of the bodies.
21. Write down three uses of laser technology.
22. Waves per second pass through a point on the surface of the pond. Calculate the wave-length if the velocity of wave is the **3.5**□□$^{-□}$**.**

SECTION "C" (DETAILED –ANSWER QUESTION)

NOTE: attempt 2 question from this section **(26)**

23.23.

a) With the help of □□, □□ and s derive the equation of motion

b) What is bimetallic strip? Describe its three applications.

c) With the help of prism, draw solar spectrum of dispersion of light.

24.24.

a) Define nuclear fission reaction. Write down its equation and explain chain fission reaction.

b) Draw the diagram of defects of eyes. Describe short sightedness and long-sightedness'. Describe a vector into its components.

c) Define resolution of vector and resolved a vector into its components.

25.25.

a) Define kinetic energy and derive the equation **K.E=1.5m**□□

b) Draw the diagram of nuclear reactor and describe the draw of boron rod.

c) With the help of figure write the four rules of reflection of rays of light by concave mirror.

PHYSICS 2013

TIME: 30 MINUTES Max. Marks: 17

SECTION "A" (MULTIPLE CHOICE QUESTIONS)

1. Choose the correct answer for each from thegiven option: **(17)**

1. The book ' kitab-ul-manazir is written by:

a) Ibn-al-haitham
b) Al-beruni
c) Yaqoob kindi
d) Dr.abdul qadeer

2. 1 pico second = ... second.

a) 10^{-3}
b) 10^{-6}
c) 10^{-9}
d) 10^{-12}

3. The rate of change of velocity is known as:

a) Displacement
b) Acceleration
c) Uniform motion
d) Speed

4. Newton's first law of motion gives the concepts of :
- **a)** Energy
- **b)** Inertia
- **c)** Momentum
- **d)** force

5. negative of a vector is that vector which is equal in magnitude, but:
- **a)** Same in direction
- **b)** Opposite in direction
- **c)** Perpendicular
- **d)** None of them

6. If the centre of gravity of a body is lower than its point of support, then its equilibrium will be:
- **a)** Static
- **b)** Unstable
- **c)** Neutral
- **d)** Stable

7. the mass of the earth:
- **a)** 6×10^{24} slugs
- **b)** 6×10^{24} g
- **c)** 6×10^{24} n
- **d)** 6×10^{24} kg

8. It is a second kind of lever
- **a)** Human arm
- **b)** Door
- **c)** Kilogram
- **d)** See-saw

9. The S.I unit of energy is:
- **a)** Newton
- **b)** Joule
- **c)** Kilogram
- **d)** Coulomb

10. Archimedes principal is applied to determine:
- **a)** Specific heat
- **b)** Specific gravity
- **c)** Specific resistance
- **d)** Latent heat

11. The conversion of liquids into vapors at all temperature is called
- **a)** Boiling
- **b)** Melting
- **c)** Evaporation

d) Sublimation

12. Sound waves are:
- **a)** Transverse waves
- **b)** Radio waves
- **c)** Longitudinal waves
- **d)** Electromagnetic wave

13. For total internal reflection the angle of incidence must be…….....the critical angle:
- **a)** Greater than
- **b)** Less than
- **c)** Equal than
- **d)** Half than

14. A ray of white light thrown onto a glass-prism cannot be
- **a)** Deviated
- **b)** Dispersed
- **c)** Focused
- **d)** Refracted

15. Three resistance of 3Ω are concerned in parallel. Their total resistance will be:
- **a)** 3 Ω
- **b)** 9 Ω
- **c)** 1 Ω
- **d)** 1/3 Ω

16. To measure potential difference the voltmeter is always concerned in the circuit in :
- **a)** Series
- **b)** Parallel
- **c)** Any way
- **d)** Parallel to ammeter

17. The elements having atomic number greater than 82 are called:
- **a)** Semiconductors
- **b)** Conductors
- **c)** Radioactive elements
- **d)** insulators

TIME: 30 MINUTES **Max. Marks: 68**

SECTION "B" (SHORT –ANSWER QUESTION)

NOTE: answer 14 question from this section no answer should exceed 3to 5 sentence (42)

2. Define physics and write the names of its any four branches.
3. Write S.I units of the following physical quantities.
   - **a)** Length
   - **b)** Electric current
   - **c)** pressure

d) Work
e) Force
f) Volume

4. The velocity of a car increases by an acceleration of 2 **m/□□□** and becomes **20 m/s in 5** second. Find the initial velocity of the car.
5. Write three difference between mass and weight.
6. Define torque. Write down its unit and formula.
7. State Newton's law of gravitation and derive **f=□** $\frac{□□□}{□□}$
8. Define work and energy. State the law of conservation of energy.
9. Find the two rectangular components of a force of 100N which is acting at an angle of 60° with X-axis **(sin 60°= 0.866, cos 60°=0.5)**
10. Define the following:
a) Lever
b) Inclined plane
c) Pulley
11. state the following laws/principles
a) Hooke's law
b) Pascal's law
c) Archimedes principle

12. Calculate the length of a second's pendulum **(10□□^−□)**
13. Write three character tics of the image formed in a plane mirror.
14. Find the focal length of a convex lens if p= 5cm, q=10cm and the image formed is virtual.
15. Define 'reflection of light'. State the two laws of reflection of light.
16. Define the following:
a) Dispersion of light
b) Photon
c) rainbow
17. state the following laws:
a) coulomb's law
b) ohm's law
c) joule's law
18. Three resistances with a source of 6 volt. Find the current flowing through the circuit.
19. What is an ammeter? How is a galvanometer change into an ammeter? Also state how an ammeter is connected in an electrical circuit?
20. Define the following:
a) Electronics
b) Doping
c) Rectification
21. The half-life of radium is 1600 years. Find the amount of radium left after 4800 years, if its mass is 60g.
22. How much amount of 800 of iron through 50°C. (Specific heat of iron= 499.8 j/kg°c.)

SECTION "C" (DETAILED –ANSWER QUESTION)

NOTE: attempt 2 question from this section **(26)**

23. **(a)** Derive **S=vit+** $\frac{1}{2}at^2$

(b) State Newton's second law and third law of motion and drive: F=ma.

(c) Draw a ray diagram of a compound microscope and describe it's working.

24. **(a)**State boyle's law and Charles' law. Also derive **pv=nRt.**

(b) Write two differences between:

i. Stress and strain

ii. Kinetic energy and potential energy

(c) Write two advantages and two disadvantage of friction

25. **(a)** With the help of a labeled diagram, explain the construction and working of an electrical bell.

(b) Define the following

i. Viscosity

ii. Orbital velocity

iii. Couple

(c) Write two differences between:

i. P-type substance and n-type substance

ii. Fission reaction and fusion reaction.

PHYSICS 2012

TIME: 30 MINUTES Max. Marks: 17

SECTION "A" (MULTIPLE CHOICE QUESTIONS)

1. Choose the correct answer for each from the given option: **(17)**

1. The refractive index of ruby is:

a) 1.51

b) 1.52

c) 1.53

d) 1.54

2. The least distance of vision for a normal eye is:

a) 20cm

b) 25cm

c) 30cm

d) 35cm

3. The speed of light in water is :

a) 2.25×10^8m/s

b) 2.26×10^8m/s

c) 2×10^{8}m/s

d) 3×10^{8}m/s

4. One nano meter takes place to:

a) 10^{-3}m

b) 10^{-5}m

c) 10^{-9}m

d) 10^{-12}m

5. Evaporation takes place at:

a) 0° c

b) 100° c

c) -100° c

d) All temperature

6. The focal length of +2 diopter convex lens is :

a) 10cm

b) 25cm

c) 50cm

d) 75cm

7. The relation between magnetic field and electric current was discovered by:

a) Newton

b) Oersted

c) Faraday

d) Fleming

8. The rate of the flow of charge in a conductor is called:

a) Current

b) Volt

c) Farad

d) Coulomb

9. When two force fx= 6n and fy=6n are acting on a body, the angle between them will be:

a) Less than 30°

b) 30°

c) 45°

d) 60°

10. The time period of second's pendulum is:

a) 1 second

b) 2 second

c) 3 second

d) 4 second

11. If mass of a body is 10kg, it's weight will be:

a) 9.8gm

b) 98N

c) 0.98N

d) 0.98kg

12. The lightest particle in an atom is:

a) Neutron

b) Proton

c) Alpa particle

d) Electron

13. Joule per coulomb is called:

- **a)** Ampere
- **b)** Ohm
- **c)** Volt
- **d)** Watt

14. The wave produced by a vibrating body in air is:

- **e)** Transverse wave
- **a)** Longitudinal wave
- **b)** Electromagnetic wave
- **c)** Stationary wave

15. If q=6 and p=2 cm, magnifying power of lens will increase:

- **a)** 2times
- **b)** 3times
- **c)** 4times
- **d)** 5times

16. The speed of sound at N.T.P (normal temperature and pressure) is:

- **a)** 336m/s
- **b)** 340m/s
- **c)** 342m/s
- **d)** 350m/s

17. It is not a simple machine

- **a)** Pair of scissors
- **b)** Pair of forceps
- **c)** Door
- **d)** Bicycle

TIME: 2.5 HOUR'S **Max Marks: 68**

SECTION "B" (SHORT –ANSWER QUESTION)

NOTE: answer 14 question from this section no answer should exceed 3to 5 sentence (42)

2. Define scalar and vector quantities with two example of each
3. Define equilibrium. Write the names of three states of equilibrium. Give one example of each.
4. With the help of trigonometric ratio, find the magnitude of horizontal and vertical components of a vector.
5. A car is moving on a straight road at a speed of 5m/s. it is accelerated at 2m/s. calculated it's velocity after 4 seconds.
6. Write down three contribution of al-beruni in the field of science.
7. State Pascal's principle and write its three uses in daily life
8. Define the following laws:
   i. Law of conversation of momentum
   ii. Newton's third law of motion
9. How much amount of heat is required to raise the temperature of 100 gm of water from 20 °c to 80 ° c (specific heat of water is 4200 joules)

10. What is Newton corpuscular theory of light? Write down two phenomena which support this theory.
11. A force of 588 N acts on a box to move it at a distance of 4m in 40seconds. Calculate the power.
12. Define the following:
    - **a)** Alternating current (A.C)
    - **b)** Electric field
    - **c)** Electrostatic induction
13. Write three uses of concave mirror.
14. Write three differences between **a**=rays and **b**- rays.
15. Derive the relation w=□²RT
16. What is a transistor? Describe two types of transistor with the help of diagram.
17. Find the resistance of a bulb, if 0.6 A current is passing through the bulb and the potential difference across the bulb is 90 volt.
18. Define the co-efficient if linear expansion and co-Efficient of volumetric Expansion. Write the relation between them.
19. 19- The radius of a concave mirror is 20cm where should an object be placed so as to get its real image magnified twice?
20. Write down three characteristics of the image formed by the plane mirror?
21. A focus of 100N acts at an angle of 60° with the Horizontal. Find its horizontal and vertical components, where Cos60°=0.5 and sin60°=0.866.
22. Write down any 3 characteristics of resistances connected in parallel.

SECTION "C" DETAILED QUESTIONS

Note: Attempt 2 Question from this section.

Q: 23

- **a.** Define the potential energy and kinetic energy and derive the **equation** □□ = □/□□□□**?**
- **b.** Define the capacity of capacitor. Write down 3 factor upon which capacity of a capacitor depends?
- **c.** Define the following.
    1. Proton
    2. Echo
    3. Nuclear Reactor
    4. Doping

Q24:

- **a.** Define Coulomb's Law. Derive the equation□ = □$\frac{□□□□}{□□}$**?**
- **b.** Define radio isotopes. Write the use of following radio isotopes
  1) Co-60 2) I-131 3) P-32
- **c.** Define the loudness of sound. Write three factors on which the loudness of sound depend.

Q25:

- **a.** Derive equation $2aS = Vf^2 - Vi^2$.
- **b.** Draw a neat labeled ray diagram of simple microscope. Write down the characteristics of the image formed by it & the formula of its magnifying power.

c. Define the following.

1. Simple harmonic motion
2. Frequency
3. Time Period
4. Pitch

PHYSICS **2011**

Time: 30 min **Max. Marks: 17**

SECTION "A" MULTIPLE CHOICE QUESTIONS

Q1. Choose the correct answer

1. Amplification can be obtained by:
A. Radar
B. Transistor
C. P.N Junction
D. Capacitor

2. If v=10 m/s, t=5sec S will be:
A. 15m
B. 5m
C. 2m
D. 50m

3. The element having atomic no greater than 82 are called;
A. Semiconductor
B. Conductor
C. Insulator
D. Radioactive Element

4. The substance placed between the conductor plates the capacitor is called
A. Dielectric
B. Capacitor
C. Insulator
D. Resistance

5. The S.I unit of G is:
A. 6.67×10^{11} N□^{2} /K□^{2}
B. 6.67×10^{-11} N□^{2} /K□^{2}
C. 6.76×10^{11} N□^{2} /K□^{2}
D. 6.76×10^{-11} N□^{2} /K□^{2}

6. Maximum beat frequency that human ear can detect is:
A. 6
B. 7
C. 5
D. 10

7. Unit of light intensity is:
A. N□^{2}
B. Volt
C. Candela
D. Joule

8. Which of the following is same as Kg. m/□^{2}:
A. Joule
B. Newton
C. Pascal
D. Watt

9. Loudness of sound depends upon:
A. Area of vibration
B. Amplitude
C. Frequency
D. All of them

10. Rate of motivation in specific direction is called:
A. Speed
B. Velocity
C. Acceleration
D. Power

11. Equivalent weight of 10 kg is :
A. 98 N
B. 980 N
C. 100 N
D. 196 N

12. Which of the following never gives a real image:
A. Plane Mirror
B. Concave Mirror
C. Convex Mirror
D. Human Eye

13. One micro meter is equivalent to:
A. 10^{-3} m
B. 10^{-6} m
C. 10^{-9} m
D. 10^{-12} m

14. Refractive index of water is:
A. 1.5
B. 1
C. 2.4
D. 1.33

15. Human eye is similar to:
A. Microscope
B. Telescope
C. Camera
D. Periscope

16. Kitab-Al-Minazir is written by:
A. Ibn-ai-Haitham
B. Al-Beruri
C. Yaqoob_al_Kindi
D. Moosa Kawarzmi

17. Acceleration is 1 Kg Ball for downward motion is:

A. 9.8 m/□^{2}

B. -9.8 m/□^{2}

C. 1 m/□^{2}

D. 98 m/□^{2}

(SECTION "B" SHORT-ANSWERS QUESTIONS)

Note: Attempt 14 Question from this section.

Q2.

2. Define physics and write down any four branches?
3. A body weighting 25 N is placed on a wooden plank. How much force is required to set it in motion if coefficient of friction between plank and the body is 0.4
4. Define work and write down its 2 formula?
5. Define the following:
   - **a)** Limiting frictions.
   - **b)** Inertia.
   - **c)** Power.
6. Define machine and write down the names of four simple machines?
7. What is transistor? Write down its advantages?
8. Draw a labeled diagram of electric bell?
9. Write down 3 differences between Mass and Weight?
10. A body of 20 Kg is moving with the speed of 15m/s. Find the momentum.
11. How much heat is required to raise the temperature of 100kg iron through 100°C? (Specific heat of iron is 499.8J/Kg °C

12. Define the following:
    - **a)** Dispersion of light.
    - **b)** Magnification.
    - **c)** Focal length of Concave mirror.
13. Draw the ray diagram of the formation of image in a plane mirror?
14. Calculate amount of current passing through an electricity heater if it takes 1800 C of charge to heat in 3 min.
15. Prove that **V=fλ**
16. Find the focal length of concave lens if P=5cm, q=10cm and the image formed is virtual?
17. A stone is dropped from a tower. It reaches the ground in 5 sec. Calculate the height of the tower.
18. Define the resolution of the vector and write two formulas of rectangular components?
19. Define Quantum theory of light?
20. A stair string vibrates at 400Hz. What is the time period of this vibration?
21. Define the following:
    - **a)** Half life of radioactive elements
    - **b)** Doping
    - **c)** Magnetic field
22. In a nuclear reaction 9×10^{10} J of energy is released due to conversion of mass into energy. How much mass has been converted into energy? (speed of light is 3×10^8m/s)

(SECTION "C" DETAILED-ANSWER QUESTIONS)

Note: Attempt 2 Question from this section. **(26)**

Q23:

- **a)** Derive the equation **S=□□t + ½ a□□**
- **b)** Draw the ray diagram of the compound microscope & write its working?

c) Define radio isotopes and state its one use in agriculture and two uses in medicine?

Q24:

a) State Boyle's law, Charles's law and Pressure law. Derive **PV=nRt.**
b) Draw a ray diagram for image formed by concave mirror and write its characteristics?
c) What is radar? Write its three uses?

Q25:

a. Define fission reaction and write down its equation and draw the diagram for chain reaction?
b. Define the following:
  1. Ampere
  2. Volt
  3. Farad
  4. Ohm
c. State the following law:
  5. Hooke's law
  6. Pascal's principle
  7. Newton second law of motion
  8. Snell's law

PHYSICS 2010

Time: 30 min Max. Marks: 17

SECTION "A" MULTIPLE CHOICE QUESTIONS

Q1. Choose the correct answer (17)

1. The law of reflection were first written by:
A. Yaqoob_al_Kindi
B. Ibn-ul-Haitham
C. Moosa Kawarzmi
D. Al-Beruni

2. In S.I unit of Mass is:
A. Gram
B. Pound
C. Slug
D. Kg

3. A 25 N force acts along the X-axis, its Y component is:
A. 0 n
B. 25 N
C. -25 N
D. None of above

4. The acceleration of a ball is thrown vertically upward will in S.i system be:
A. 98 m/□²
B. 980 m/□²
C. -9.8 m/□²
D. 32 ft/□²

5. A body will be in a state of an equilibrium if its center of gravity lies:
A. At the point of suspension
B. Below the point of suspension

C. Above the point of suspension
D. None of the above

6. The mass of Earth is:
A. 6×10^{24} Slugs
B. 6×10^{24} Gram
C. 6×10^{24} N
D. 6×10^{24} Kg

7. The S.I unit of Work is:
A. Watt
B. Newton
C. N-m
D. Dyne

8. For an ideal machine:
A. The output is always greater than the input
B. The output is always equal than the input
C. The output is always less than the input
D. The output is seldom equal than the input

9. The pressure of the liquid depend:
A. Only upon its dignity
B. Only upon its height above the point inside the liquid
C. upon its dignity as well as height above the point inside the liquid
D. neither upon its density nor height

10. The max density of pure water is:
A. 0°C
B. 100°C
C. 4°C
D. -4°C

11. Sound wave cannot travel through:
A. Water
B. A sound
C. Vacuum
D. Gases

12. A virtual erect and diminished image is always obtained from a:
A. Plane mirror
B. Concave mirror
C. Convex mirror
D. Parabolic mirror

13. The speed of light in vacuum is:
A. $3x10^{5}$ Km/hr
B. $3x10^{8}$ m/min
C. $3x10^{8}$ Km/s
D. $3x10^{8}$ m/s

14. Is I=1.5 amps R= 10 ohms then V is:
A. 15 volts
B. 1.5 Volts
C. 150 volts
D. 10 volts

15. Shunt convert the galvanometer into:
A. A voltmeter
B. An ammeter
C. A watt meter
D. A calorie meter

16. The reflection is obtained from a:
A. Transistor
B. Capacitor
C. Resistor
D. Semi-conductor diode

17. Gamma ray are:
A. Fast moving neutral particle
B. Electromagnetic radiation
C. Fast moving positively charged particles'
D. Fast moving negatively charged particles'

(SECTION "B" SHORT QUESTIONS)

Note: Attempt 14 Question from this section.

2. Define any 3 branches of physics?
3. Two forces of 3N and 4N are acting on a body if the angle between them is 90°. Find the magnitude of the resultant vector?
4. If Fx, Fy are the horizontal and vertical components of a vector $\vec{F}$ write down the formula for the magnitude and direction of F. Show Fx, Fy and F by diagram?
5. A car moving from a uniform acceleration attains a speed of 36km/hr in 2 min; find the acceleration of the car.
6. Write down 3 methods of reducing friction?
7. Define linear momentum. Write down its formula and S.I Unit?
8. Define Equilibrium. Write down the conditions of equilibrium and the relate formula?
9. A stone of 200gram mass tied to one end of the string of length 50cm is whirled from the other end in a circle with the constant speed of 2 m/s: find the tension in the string?
10. A length of the handle of a screw jack is 42cm and its pitch is 1.001m: Find its mechanical advantages?
11. State Pascal's principle. Describe any one of its application.
12. 117.6 J heat is required to raise the temperature of 10gm of silver by 50°C: Find the specific heat of silver.
13. Define the following:
    1) Echo **2)** Ultrasonic waves **3)** Beats
14. Define the following:
    1) Irregular reflection **2)** Radius of curvature **3)** Magnification of concave mirror.
15. The convex lens from a virtual image of an object placed 5cm away from the optical center at a distance of 10cm. determine the focal length of the convex lens.
16. Define: **1)** Proton **2)** Dispersion of light **3)** total internal reflection
17. What is the wave theory of light? Write down two phenomena which support this theory?

18. A force of 50N acts on a body. If the moment arm is o.5cm , find the value of torque
19. A 100 watt bulb operates is a 220V circuit: find the current thought the bulb?
20. What is an electromagnet? Illustrate it's with a labeled diagram and write down its uses?
21. Define reflection. Describe the working of a semi conductor diode as a rectifier?
22. Write down three precaution to minimize radiation hazard

SECTION "C" DETAILED-ANSWER QUESTIONS

Note: Attempt 2 Question from this section. **(26)**

Q23:

- **a.** Derive the equation **S=□t + ½ a□**
- **b.** Write down two characteristics properties of simple harmonic motion?
- **c.** The frequency if vibration of a wire is 200 hertz: find its time period?
- **d.** Write down four similarities between electrostatics induction and magnetism?

Q24:

- **a.** Define evaporation. Write down any four factors on which the rate of evaporation depends?
- **b.** Define Kinetic and Potential energy and write down any two differences between them?
- **c.** Draw ray diagram only to show the nature, position and size of the image formed by a concave mirror when the object is placed :
  - At the center of curvature of the mirror.
  - Between the center of curvature and the principle focus

Q25:

- **a.** What is natural radioactivity? Write down four properties of alpha rays?
- **b.** Define the following
  1. Refractive index
  2. Critical angle
  3. Power of a lens
  4. Magnifying glass
- **c.** What is the electric capacitor? Write down the 3 factors on which the capacity depends?

PHYSICS (THEORY) 2009

Time: 3 hours **Max. Marks: 75**

Note: Attempt six Questions is all, 3 questions from section A, 2 questions from section B and one question from section C

SECTION "A"

Q1:

- **a)** Derive the equation **S=□t + ½ a□**
- **b)** Write 2 points Difference between the following
  1. Mass & Weight
  2. Heat & Temperature
- **c)** A motorcycle is moving with a velocity of 72km/hr on a straight road. When the brake are applied the motorcycle comes to rest after covering a distance of 10cm. Calculate its acceleration
- **d)** The name of a famous book of Al-Beruni is_____(Fill the blank)

Q2:

- **a)** Define kinetic energy and derive it equation?
- **b)** State the following laws:
  1. Law of conservation of momentum
  2. Law of inertia
  3. Archimedes Principle
  4. Law of heat of exchange
- **c)** Find the work done when the force of 400 N Acting at an angle of 60° with the ground moves an object to a distance of 10 m along the ground (Cos60° =0.5)
- **d)** Why does the nail sink in water where as a ship having a bigger mass floes on the surface of water (give reason)

Q3:

- **a)** Define the resolution of vector. How is a vector resolved into its component vector?
- **b)** State Newton's law of gravitation and derive its equation
- **c)** Define a machine and its mechanical advantages. Find the mechanical advantage of inclined plane?
- **d)** The value of g is_____(Fill the blank)

Q4:

- **a)** Define centripetal force what are the factors on which it depends? Write down the formula of centripetal force?
- **b)** Write two contribution of each of the following
  1. Al-Beruni
  2. Ibn-ul-Haitham
- **c)** State Charles's, Boyle's law. Write the formula of the general gas equation?
- **d)** The speed of a body in a given direction is called_____(Fill the blank)

Q5:

- **a)** Define:
  1) Co-efficient of linear expansion
  2) Specific heat
  3) Regulations
  4) Torque
  5) Center of gravity
- **b)** Define stress, strain and Hooke's law and write the formula of young's modulus of elasticity.
- **c)** Write 3 states of Equilibrium with the help of a diagram
- **d)** Why is a gap left between two pieces of a railway track?

SECTION "B"

Q6

- **a)** Draw a ray dig of the image formed by a plane mirror and write its 3 characteristics?
- **b)** Define the following;
  1. Reflective index
  2. Regular reflection
  3. Direct current
  4. Electromagnet
- **c)** An object is placed at a distance of 15am from a concave mirror of focal length 10cm. find the position and nature of the image formed by it?
- **d)** The unit or charge is_____Fill the blank)

Q7:

a) Define total internal reflection with the help of ray dig and write the 2 conditions necessary for it.

b) State Coulomb's law and derive it equation?

c) Find the potential difference between 2 ends of a conductor if its resistance is 5 ohms and a current of a 500 millimeter is passing through it.

d) the unit of current is_____Fill the blank)

Q8

a) Write down the three characteristics of the resistances.

b) Write down the four uses of spherical mirror

c) Describe the Newtons Corpuscular theory of light.

d) Magnification P/Q (Fill in the Blank)

SECTION "C"

Q9:

a) Define the wavelength, Frequency and Velocity of a Wave And Derive its Equation

b) Write four properties of alpha rays.

c) Define the following:

1. Transistor

2. Half life of an element

3. Radar

d) The element having mass number more than 82 are called_____Fill the blank)

Q10:

a) Define simple harmonic motion & verify it with the help of simple pendulum?

b) Write two point of difference between the following :

1. P-Type Substance & N-Type Substance.

2. Fission and Fusion reaction

c) State any 3 characteristic of musical sound and describe any one of them?

d) The sound of thunder in the sky is heard later then the streak of light Although thy are produced at the same time (give reason)

PHYSICS 2008

Time: 3 hours **Max. Marks: 75**

Note: Attempt six Questions is all, 3 questions from section "A", 2 questions from section "B" and one question from section "C".

SECTION "A"

Q1:

a) Derive the equation $2aS = v_f^2 - v_i^2$

b) Write the contribution of each of the following in the field of physics

1) Al-Beruni **2)** Yaqoob Al-Kindi

c) A mass of 10kg at the end of a string is being whirled in a circle of radius 5cm with the speed of 4m/s. what will be the centripetal force?

d) One mill ampere is =____Ampere.

Q2:

a) State Pascal's Law And explain the working of hydraulic brake system with the help of dig?

b) Write two points of the difference between of the following

1. Scalar and vector

2. "g" and "G"

c) A car is moving with a velocity of 36km/hr is bought to rest in 5 second. Find its deceleration.

d) The point at which the whole weight of the body appears to act is called _____

Q3:

a) Define Newton law of gravitation and find the equation of the mass with the help of formula **F= G □□ x □□/ □□**

b) A 100 kg car is accelerated from the rest at **4m/□□** for 10 sec , Calculate the work done

c) State the following:

1. Hooke's Law
2. Law of inertia
3. Law of conservation of heat energy

d) Steam produces more sever burn on the body than the hot water (give reason)

Q4:

a) Draw a labeled dig of refrigerator and describe the working of its main part.

b) Two points of difference between

1. Distance and displacement
2. Kinetic and potential energy.

c) Define:

1. Elasticity
2. Newton(unit)
3. Force

d) The fundamental unit of length in S.I System is _____

Q5:

a) Define evaporation and define any four factors on which the rate of evaporation depends?

b) What is the kinetic energy of the 200 kg of car which is travelling with the velocity of 36 km/hr?

c) Write 3 methods of reducing friction.

d) Mechanical advantages of screw jack.

SECTION "B'"

Q6:

a) With the help of dig, explain the working of electric bell.

b) A body is kept a distance of 10cm from a concave mirror. The radius of curvature of the mirror is 10 cm, Find the position and nature of image.

c) Define:

1. Focal length
2. Farad
3. Critical angle

d) The device which collects the charge is called_____.

Q7:

a) Explain the working of compound microscope with the help of diagram.

b) Write 2 Point Of difference between.

1. Direct and Alternating current
2. Real and Virtual Image.

c) Define Coulomb's Law And derive its equation

d) The substance used as a medium between two plates of a capacitor is called_____.

Q8:

a) With the help of ray dig show the nature, size and Position of the image Formed in a concave mirror when.
   1. The object placed beyond "C"
   2. The object placed Between "c" and "F"

b) Find the current passing through the heater which has resistance of 20 ohms and a potential difference of 220 V is supplied to it.

c) Define proton and write its 2 characteristics.

d) If a low resistance is connected to a galvanometer, it is converted into_____.

SECTION "C"

Q9:

a) Define loudness of sound, Give 3 factors on which it's depending?

b) Write two points
   1. Alpha ray & beta ray
   2. Fission reaction and Fusion reaction

c) Write 3 advantages of transistor.

d) The no of proton in nucleus is called_____.

Q10:

a) Define radio isotopes. Define any 3 uses of radio isotopes in industry.

b) When a sound wave of frequency 200 Hz And wavelength 3m Passes through a medium. Calculate the velocity of the wave in that medium.

c) Define:
   1. Time period
   2. Amplitude
   3. Doping

d) The sound of explosion of the sun is not heard on the earth(Give reason)