NEB -MODEL GRADE XII
2082(2025)
Physics
(New course)

Group 'A'

Multiple Choice Questions

Rewrite the correct option for each question in your answersheet.
[11×1=11]

1) Which quantity in rotational motion is analogous to mass in linear motion?

A) Torque C) Moment Of Inertia

B) Angular Velocity D)Angular Momentum

2) Which quantity remains constants in SHM?

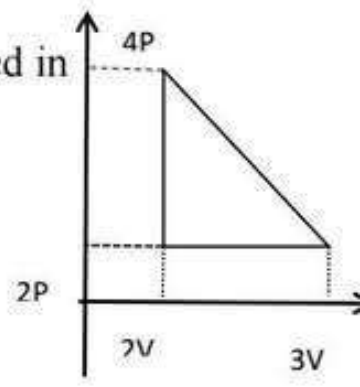
A) Displacement
B) Acceleration
C) Frequency
D) Velocity

3) If the velocity of a fluid increases in a pipe, what happens to the pressure, according to Bernoulli's equation?

A) The pressure increases
B) The pressure decreases
C) The pressure remains constant
D) The pressure fluctuates

4) An ideal is taken through a series of changes represented in the graph .The net work done by the end of the cycle is

A) PV B)2PV C) 4PV D)8PV



NEB -MODEL GRADE XII
2082(2025)
Physics
(New course)

5)110 joule of heat is added to the gaseous system ,whose internal energy is 40 J.Then the amount of external work done is(in joule)

A)150 c)120
B) 70 D)110

5) What is the efficiency of a carnot engine working between steam point and ice point?

A)27 % B)37% C)50% D) 75%

6) In interference,the reflection is change by which angle?

A)0° b)90° C) 180° D) 360°

7) If the angle of polarization is 45°, the medium is most likely

A) Glass
B) Air
C) Vaccum
D) All medium having refractive index greater than 1

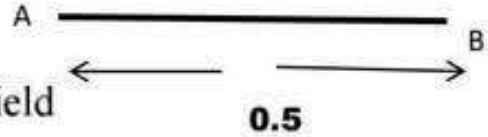
8) Which of the following is not a ferromagnetic material?

A) Co B)Ni C)Fe D)Al

9) Kvl(Kirchhoff's Mesh law) is based on the conservation of

A) Mass
B) Charge
C) Energy
D) Voltage

10) What is the magnitude of the Magnetic force on the straight Line conductor AB when magnetic field



NEB -MODEL GRADE XII
2082(2025)
Physics
(New course)

Of 0.1T is palced parallel to it and 0.3A is passed to it.

A)0.000N B)0.005N C)0.015N D)0.03N

11) The barrier potential for the silicon semiconductor diode is

A)0.1V B)0.3V C) 0.7V d)1V

Group 'B'

SHORT ANSWER QUESTION [8×5=40]

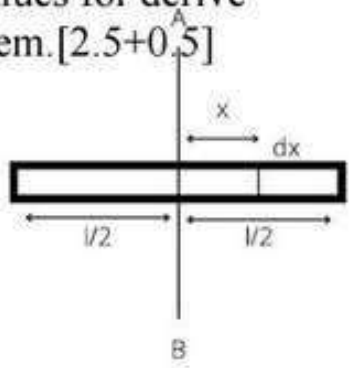
12) A)Define simple pendulum.Write any two shorts comings of simple pendulum.[1+1]

B) A second pendulum is taken to the moon .If the time on the surface of moon is 4.90 seconds.What is the acceleration due to gravity on moon.[3]

OR

A) Why can a ballet dancer spin faster when she brings her arms closer to her body?[2]

B) Derive the condtion for I for the system which is shown in the figure(AB is the axis of rotation,assume the values for derive this if necessary).Also write the name of the theorem.[2.5+0.5]



NEB -MODEL GRADE XII
2082(2025)
Physics
(New course)

13)

A) Castor oil at 20°C has a coefficient of viscocity $2.42 NS/m^2$ and density 940 kgm^{-3}.Calculate the terminal velocity of a steel ball of radius 1mm falling under gravity in the oil,taking density of steel as 7800kgm^{-3}.[3]

C) Describe the angle of contact&capillary action for concave and plane meniscus with example.[2]

14)

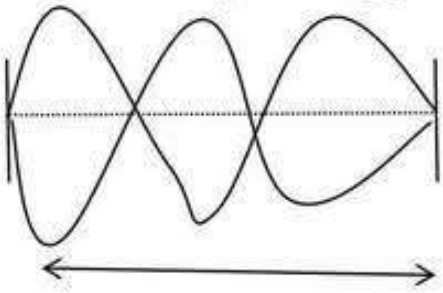
a) Is the second law of thermodynamics a fundamental law,or does it emerge from other law?[2]

b)Derive the condition for the workdone in a isothermal process .Also show the curve of PV in isothermal process.[3]

15)

The figure shows the certain mode of vibration of streched string.

A) The velocity of the particle is 340m/s and the frquency is 10Hz .Then find the wave number of the particle[2]



l

B) Draw the similar figure
for the fundamental mode of vibration[1]

C) Obtain the frequency of given mode of vibrations in terms of fundamental frequency.[2]

NEB -MODEL GRADE XII
2082(2025)
Physics
(New course)

16)Potentiometer is also called as ideal voltmeter.

A) Why potentiometer is called a ideal voltmeter.[1]

B) Write the working principal of potentiometer.[1]

C) Derive the condition for wheatstone bridge.Draw the diagram of a meter bridge.[3]

17)

A) Electron beam is moving in a magnetic field of 0.3T with the velocity of 1000m/s .Calculate the minimum and maximum force on the electron beam.[2]

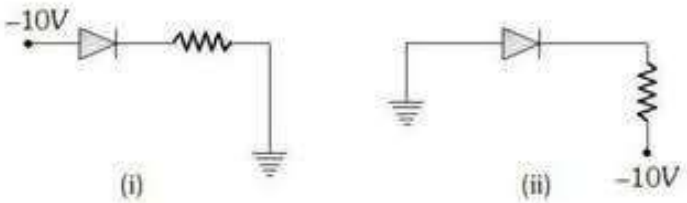
B) Define ampere's circuital law.Derive the condition for a magnetic field intensity due to the straight current carrying conductor using Biot and Savart Law.[3]

18)

When P type and N type semiconductor are joined suitably,The holes are flows form P to N and electrons are flows from N to P and form depletion layer.

A) Why holes flows toward N and electron flows towards P.Explain with necessary diagram ,show deletion layer and the formation of potential barrier.[1+2]

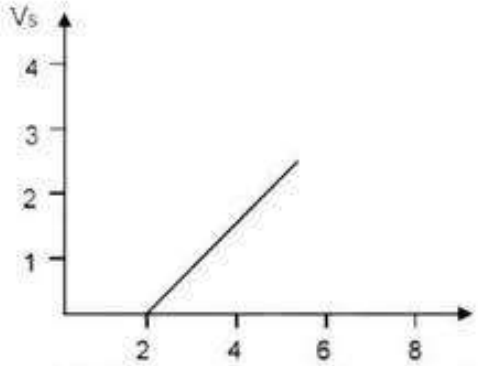
B) Determine which one is reverse and which is forward bias in the following figure with proper explanation.[2]



19) A)Can we use water instead of clock oil in the Millikan's oil drop experiment ?[1]

B)Which path is followed by electron beam if the beam enters electric field.Explain[2]

C) An electron moves through a region where electric field $E=3\times10^4$V/m and magnetic field B=0.01T are perpendicular to each other.
Find the velocity of the electron so that it passes undeflected.[2]
OR



A)Figure shows the graph between stopping potential and frequency(10^{14}) .Find:[3]
1)Plancks constant(h)
2) Work function
B)X-ray radiation is inverse process of photoelectric effect .Explain[2]

Group 'C' [3×8=24]

20)
a).A monochromatic light of wavelength 5890Å is incident normally on the diffraction grating which has 6000lines per centimeter.
I) Is third order image is possible with this grating.[2]
b)Name any two crystals that is used in the polarization.A polarizer is used for reduce the intensity of light.Explain with real life example.[2]

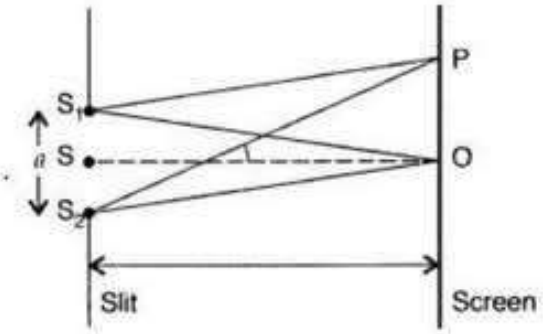
NEB -MODEL GRADE XII
2082(2025)
Physics
(New course)

C) A sound of frequency 1500 Hz is emitted by a source which moves away from an observer and moves towards a cliff at a speed of 6 m/s..

I)Calculate the frequency of the sound which is coming directly from the source.[1.5]

II)Compute the frequency of sound heard by the observer reflected off the cliff. Assume the speed of sound in air is 330 m s-1.[1.5]

D)Write the condtion for fringe width for given figure if the slit screen distance is 'd' and wavelength of source is 'k'.[1]

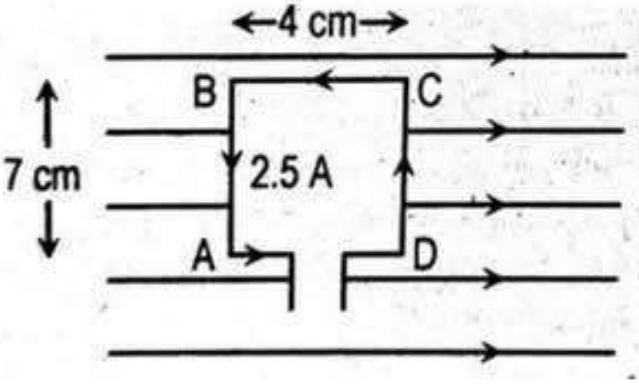


21)

A) An aircraft with a wingspan of 40 m flies with a speed of 1080 km/h in the eastward direction at a constant altitude in the northern hemisphere where the vertical component of earth's magnetic field is 1.75×10^{-5} T. Find the emf that develops between the tips of the wings.[2]

B) Derive an expression for force exerted per unit length between two parallel current carrying conductors if currents are flowing int the same direction.Hence,define one ampere current.[3]

C)Figure shows that a rectangular metal frame ABCD placed in a uniform magnetic flux density of 4.5×10^{-3}T.[3]



I) Calculate the force experienced by AB.[1]

II) Does side BC experience force?Explain.[2]

OR

A) An ac source of 220 V, 50 Hz is connected to a series circuit containing a resistor R and inductor L and a capacitor C.If R = 200 Ω , L = 0.5 H and C = 10μF.

I) Draw neat and clean phasor diagram for above condition.[1]

II) calculate,

the current in the circuit[2]

the phase angle[1]

the power consumed in the circuit.[1]

B) Define Admittance for LCR circuit.[1]

C) Why choke is preffered to ordinary resistor in contolling ac supply.[2]

22

A) State Bohr's Postulates of atomic model.[2]

B) Derive an expression for radius of n^{th} orbit in H-ATOM.[3]

C) Calculate the de broglie wavelength of electron when it is accelerated by 500Volts.(Mass ko electron $=9.1\times10^{-31}$kg,h=6.62×10^{-34}js,e=1.6×10^{-19}C).[3]

OR

A) Define decay constant.[1]

B) Derive an expression N=$N_0e^{-\lambda t}$ where the symbol carry their standard meanings.[3]

C) Explain α & β decay.[2]

D) What makes radioactive atoms get old so quickly and decay?[1]

E) The half-life of a radioactive element is 5 days. How much of a 100 g sample will remain after 10 days?[1]

Best Of Luck