CLASS XII
GUESS PAPER
PHYSICS

DAILY HOMEWORKS (DO FIVE QUESTIONS PER DAY) OF UNIT 6TH,7TH,8TH,9TH AND 10TH

Day1

1. What is sky wave propagation?

2. You are given following three lenses. Which two lenses will you use as an eyepiece and as an objective to construct an astronomical telescope?

Lenses	Power (P)	Aperture (A)
L1	3 D	8 cm
L2	6 D	1 cm
L3	10 D	1 cm

3. If the angle between the pass axis of polarizer and the analyser is 45°, write the ratio of the intensities of original light and the transmitted light after passing through the analyser.

4. What type of wavefront will emerge from a (i) point source, and (ii) distant light source?

5. Two nuclei have mass numbers in the ratio 1 : 2. What is the ratio of their nuclei densities?

Day2

1 . By what percentage will the transmission range of a T.V. tower be affected when the height of the tower is increased by 21 %?

2. Why are high frequency carrier waves used for transmission?

3. What is meant by term 'modulation'? Draw a block diagram of a simple modulator for obtaining an AM signal.

4. (i) Draw a circuit diagram to study the input and output characteristics of an *n-p-n* transistor in its common emitter configuration. Draw the typical input and output characteristics. (ii) Explain, with the help of a circuit diagram, the working of *n-p-n* transistor as a common emitter amplifier.

5. How is a zener diode fabricated so as to make it a special purpose diode? Draw *I-V* characteristics of zener diode and explain the significance of breakdown voltage. Explain briefly, with the help of a circuit diagram, how a *p-n* junction diode works as a half wave rectifier.

Day3

1. Trace the rays of light showing the formation of an image due to a point object placed on the axis of a spherical surface separating the two media of refractive indices $n1$ and $n2$. Establish the relation between the distances of the object, the image and the radius of curvature from the central point of the spherical surface. Hence, derive the expression of the lens maker's formula.

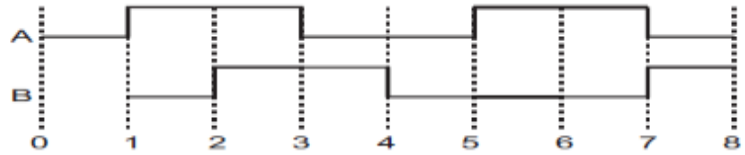
2. Draw the labelled ray diagram for the formation of image by a compound microscope. Derive the expression for the total magnification of a compound microscope. Explain why both the objective and the eye piece of a compound microscope must have short focal lengths.
3.. What is ground wave propagation?
4.. Unpolarized light is incident on a plane surface of refractive index m at angle *i*. If the reflected light gets totally polarized, write the relation between the angle *i* and refractive index m.
5. Draw a diagram to show refraction of a plane wavefront incident on a convex lens and hence draw the refracted wave front.

Day4

1. The nuclei have mass numbers in the ratio 1 : 3. What is the ratio of their nuclear densities?
2. The output of a 2-input AND gate is fed to a NOT gate. Give the name of the combination and its logic symbol. Write down its truth table.
3.. At what angle of incidence should a light beam strike a glass slab of refractive index 3, such that the reflected and the refracted rays are perpendicular to each other?
4. What is space wave propagation?
5. Two nuclei have mass numbers in the ratio 2 : 5. What is the ratio of their nuclear densities?

Day5

1.. Differentiate between a ray and a wavefront.
2.. (i) Sketch the output wavefrom from an AND gate for the inputs *A* and *B* shown in the figure.



(ii) If the output of the above AND gate is fed to a NOT gate, name the gate of the combination so formed.
3. How would the angular separation of interference fringes in Young's double slit experiment change when the distance between the slits and screen is doubled?
4. Two thin lenses of power +6 D and – 2 D are in contact. What is the focal length of the combination?
5. The stopping potential in an experiment on photoelectric effect is 1.5 V. What is the maximum kinetic energy of the photoelectrons emitted?

Day6

1. Two nuclei have mass numbers iin the ratio 1 : 8. What is the ratio of their nuclear radii?
2. (a) Optical and radio telescopes are built on the ground while *X*-ray astronomy is possible only from satellites orbiting the Earth. Why? (b) The small ozone layer on top of the stratosphere is crucial for human survival. Why?
3. Define the term 'linearly polarised light.' When does the intensity of transmitted light become maximum, when a polaroid sheet is rotated between two crossed polaroids?
4. (a) The mass of a nucleus in its ground state is always less than the total mass of its constituents – neutrons and protons. Explain. (b) Plot a graph showing the variation of potential energy of a pair of nucleons as a function of their separtion.

5. Write the function of (i) Transducer and (ii) Repeater in the context of communication system.

Day7

1. Write two factors justifying the need of modulation for transmission of a signal.
2. Draw a schematic arrangement of the Geiger-Marsden experiment. How did the scattering of a-particles of a thin foil of gold provide an important way to determine an upper limit on the size of the nucleus? Explain briefly.
3. Distinguish between sky wave and space wave propagation. Give a brief description with the help of suitable diagrams indicating how these waves are propagated.
4. With the help of a suitable diagram, explain the formation of depletion region in a *p-n* junction. How does its width change when the junction is (i) forward biased, and (ii) reverse biased?
5. Give a circuit diagram of a common emitter amplifier using an *n-p-n* transistor. Draw the input and output waveforms of the signal. Write the expression for its voltage gain.

Day8

1. (a) (i) Draw a labelled ray diagram to show the formation of image in an astronomical telescope for a distant object.
(ii) Write three distinct advantages of a reflecting type telescope over a refracting type telescope.
2. (a) With the help of a suitable ray diagram, derive the mirror formula for a concave mirror.
3. Give the logic symbol of NAND gate.
4. Two nuclei have mass numbers in the ratio 8 : 125. What is the ratio of their nuclear radii?
5. The maximum kinetic energy of a photoelectron is 3 eV. What is its stopping potential?

Day9

1. (i) State the principle on which the working of an optical fiber is based. (ii) What are the necessary conditions for this phenomenon to occur?
2. (i) With the help of circuit diagrams distinguish between forward biasing and reverse biasing of a *p-n* junction diode.
(ii) Draw *V-I* characteristics of a *p-n* junction diode in (a) forward bias, (b) reverse bias. .
3. Draw the wavefront coming out of a convex lens when a point source of light is placed at its focus.
4. Unpolarised light of intensity I is passed through a polaroid. What is the intensity of the light transmitted by the polaroid?
5. Why are coherent soruces required to create interference of light?

Day10

1. In the Rutherford scattering experiment the distance of closest approach for an a-particle is d0 . If a-particle is replaced by a proton, how much kinetic energy in comparison to a-particle will it require to have the same distance of closest approach d0 ?
2. A glass lens of refractive index 1.45 disappears when immersed in a liquid. What is the value of refractive index of the liquid?
3. What is the ratio of radii of the orbits corresponding to first excited state and ground state in a hydrogen atom?
4. Draw the circuit diagram of an illuminated photodiode in reverse bias. How is photodiode used to measure light intensity?

5(*a*) The bluish colour predominates in clear sky. (*b*) Violet colour is seen at the bottom of the spectrum when white light is dispersed by a prism. State reason to explain these observations.

Day11

1. Plot a graph showing the variation of stopping potential with the frequency of incident radiation for two different photosensitive materials having work functions $W1$ and $W2$ ($W1 > W2$). On what factors does the (*i*) slope and (*ii*) intercept of the lines depend?

2. What is an unpolarized light? Explain with the help of suitable ray diagram how an unpolarized light can be polarized by reflection from a transparent medium. Write the expression for Brewster angle in terms of the refractive index of denser medium.

3. (*i*) Define 'activity' of a radioactive material and write its S.I. unit. (*ii*) Plot a graph showing variation of activity of a given radioactive sample with time..

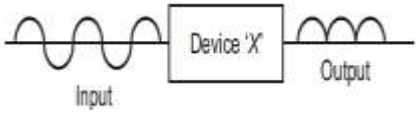
4. What is space wave propagation? Give two examples of communication system which use space wave mode

5. State Huygen's principle. Show, with the help of a suitable diagram, how this principle is used to obtain the diffraction pattern by a single slit. Draw a plot of intensity distribution and explain clearly why the secondary maxima become
weaker with increasing order (*n*) of the secondary maxima.

Day12

1 . Draw a ray diagram to show the working of a compound microscope. Deduce an expression for the total magnification when the final image is formed at the near point.

2. (*a*) Explain the formation of depletion layer and potential barrier in a *p-n* junction. (*b*) In the figure given below, the input waveform is converted into the output wave from a device '*X*'. Name the device and draw its circuit diagram.



3. The radius of innermost electron orbit of a hydrogen atom is 5.3 x10-^{11} m. What is the radius of orbit in the second excited state?

4. Which part of electromagnetic spectrum is absorbed from sunlight by ozone layer?

5. What is the range of frequencies used for T.V. transmission? What is common between these waves and light waves?

Day13

1. A biconvex lens has a focal length 2/3 times the radius of curvature of either surface. Calculate the refractive index of lens material.

2. (*i*) Why does the Sun appear reddish at sunset or sunrise? (*ii*) For which colour the refractive index of prism material is maximum and minimum?

3. An electron is accelerated through a potential difference of 144 volts. What is the de-Broglie wavelength associated with it? To which part of the electromagnetic spectrum does this wavelength correspond?

4. (*i*) Why is communication using line of sight mode limited to a frequencies above 40 MHz?.

5. A converging lens is kept co-axially in contact with a diverging lens – both the lenses being of equal focal lengths. What is the focal length of the combination?

Day14

1. Define ionisation energy. What is its value for a hydrogen atom?
2. Two conducting wires *X* and *Y* of same diameter but different materials are joined in series across a battery. If the number density of electrons in *X* is twice that in *Y*, find the ratio of drift velocity of electrons in the two wires.
3. Name the part of electromagnetic spectrum whose wavelength lies in the range of 10^{-10} m. Give its one use.
4. When light travels from a rarer to a denser medium, the speed decreases. Does this decrease in speed imply a decrease in the energy carried by the light wave? Justify your answer.
5. Write Einstein's photoelectric equation. State clearly the three salient features observed in photoelectric effect, which can be explained on the basis of the above equation.

Day15

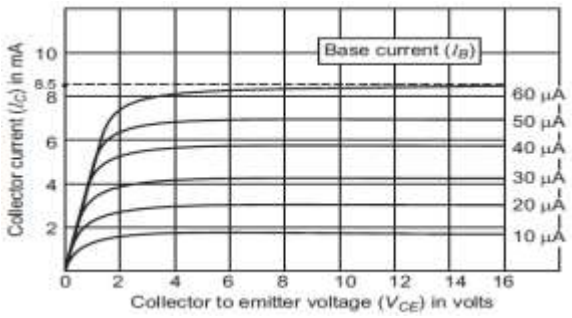
1. Draw a plot of potential energy of a pair of nucleons as a function of their separation. Write two important conclusions which you can draw regarding the nature of nuclear forces.
2. Draw a plot of the binding energy per nucleon as a function of mass number for a large number of nuclei, 2 £ *A* £ 240. How do you explain the constancy of binding energy per nucleon in the range 30 < *A* <170 using the property that nuclear force is short-ranged?
3. (*a*) Draw the circuit diagrams of a *p-n* junction diode in (*i*) forward bias, (*ii*) reverse bias. How are these circuits used to study the *V-I* characteristics of a silicon diode? Draw the typical *V-I* characteristics? (*b*) What is a light emitting diode (LED)? Mention two important advantages of LEDs over conventional lamps.
4. Find the ratio of energies of photons produced due to transition of an electron of hydrogen atom from its: (*i*) second permitted energy level to the first level, and (*ii*) the highest permitted energy level to the first permitted level
5 .State Bohr's quantisation condition for defining stationary orbits.

Day16

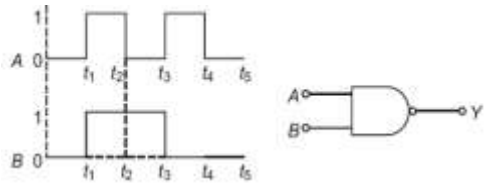
1. In standard AM broadcast, what mode of propagation is used for transmitting a signal? Why is this mode of propagation limited to frequencies upto a few MHz?
2. Define the resolving power of a microscope. How is this affected when (*i*) the wavelength of illuminating radiations is decreased, and (*ii*) the diameter of the objective lens is decreased? Justify your answer.
3. Draw a schematic diagram of a reflecting telescope (Cassegrain). Write two important advantages that the reflecting telescope has over a refracting type.
4. (*a*) State briefly any two reasons explaining the need for modulating a signal. (*b*) Draw a labelled block diagram of a simple modulator for obtaining an AM signal.
5. Draw the circuit diagram of a base-biased *n-p-n* transistor in *C-E* configuration. Explain how this circuit is used to obtain the transfer characteristic (*Vo -Vi* characteristics). How do we explain the working of a transistor as a switch using the characteristic?

Day17

1. The typical output characteristics (*IC* □ *VCE*) of an *n-p-n* transistor in *C-E* configuration is shown in the figure. Calculate (*i*) the output resistance *r*0 and (*ii*) the current amplification factor □*ac* .



2. Draw the output wavefrom for the following gate. Also, name the gate.



3. Show graphically, the variation of the de-Broglie wavelength (l) with the potential (*V*) through which an electron is accelerated from rest.

4. In a transistor, doping level in base is increased slightly. How will it affect (*i*) collector current and (*ii*) base current?

5. Define the term 'wattless current'.

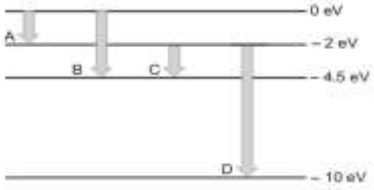
Day18

1. When monochromatic light travels from one medium to another, its wavelength changes but frequency remains the same. Explain.**.**

2. Two convex lenses of same focal length but of aperture *A*1 and *A*2 (*A*2 < *A*1), are used as the objective lenses in two astronomical telescopes having identical eyepieces. What is the ratio of their resolving power? Which telescope will you prefer and why? Give reason.

3. Draw a schematic diagram showing the (*i*) ground wave (*ii*) sky wave and (*iii*) space wave propagation modes for em waves.Write the frequency range for each of the following: (*i*) Standard AM broadcast (*ii*) Television(*iii*) Satellite

4. The energy levels of a hypothetical atom are shown below. Which of the shown transitions will result in the emission of a photon of wavelength 275 nm? Which of these transitions correspond to emission of radiation of (*i*) maximum and (*ii*) minimum wavelength?



5. (*a*) Draw a ray diagram to show refraction of a ray of monochromatic light passing through a glass prism.Deduce the expression for the refractive index of glass in terms of angle of prism and angle ofminimum deviation.(*b*) Explain briefly how the phenomenon of total internal reflection is used in fibre optics.

Day19

1. $A \xrightarrow{\alpha} A_1 \xrightarrow{\beta} A_2 \xrightarrow{\alpha} A_3 \xrightarrow{\gamma} A_4$

A radioactive nucleus '*A*' undergoes a series of decays according to the following scheme : The mass number and atomic number of A are 190 and 75 respectively. What are these numbers for A 4 ?

2. Write any two characteristic properties of nuclear force.

3.What happens to the width of depletion layer of a *p-n* junction when it is (*i*) forward biased, (*ii*) reverse biased?

4. Define the term 'stopping potential' in relation to photoelectric effect.

5.the ratio of energy stored in the two configurations if they are both connected to the same source.

6. Explain briefly, with the help of a circuit diagram, how a *p-n* junction diode works as a half wave rectifier.

Day20

DIAGRAM QUESTIONS :- 1. Intensity pattern for interference and diffraction 2. Compound microscope 3. Telescope and reflecting type telescope 4. Davisson germer experiment 5. Geiger marsd on experiment for alpha particle scattering 6. Binding energy per nucleon curve vs atomic mass no. 7. Potential energy of pair of nucleon vs separation 8. Energy band diagram for p type and n type 9. Forward biasing and reverse biasing characteristics for junction diode 10. Full wave and half wave recitifier 11. Photodiode and solar cell and their characteristics 12. Zener diode 13. transistor input output characteristics 14. Amplifier 15. Logic gate and their symbol 16. Block diagram of communication system , transmitter ,receiver , production of AM.

IMPORTANT NOTE :-

1. DO work sincerely, it Is very important FOR GOOD MARKS
2. All these questions are from last 10 years previous Board exam
3. For any doubt u can ask on mobile **(9467853611**) or personally
4. Do diagrams with proper labeled , neat and clean
5. Do also chapter wise **AMPLITUDE** Assignment for these units
6. Do **NCERT** questions of these chapter with example
7. Also revise latest **CBSE** sample paper

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