

# Directorate of Education

Govt. of NCT of Delhi

## Additional Support Material on Value Based Questions for the Session 2012-2013

**Subject: Physics**

**Class : XII**

Under the guidance of :

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Addl. DE (School/Exam)

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## Preface

Central Board of Secondary Education (CBSE), whose educational process is inclusive of co-scholastic areas of life skills, attitude and values, sports and games as well as co-curricular activities, is aiming to strengthen its education system in the area of value education. For the same, the board will be introducing value-based questions in the papers of final examinations in all major subjects for classes XI and XII from the academic session 2012-13 .

The Board has decided to assess students for 5 percent weight age in classes XI and XII through questions which will be integrated with the content of the subject and analyzed on the basis of the values it reflects. The questions will be 3-4 marks in a question paper of 70-90 marks.

The sample value based questions deal with the life skills and values attained by students like Self Awareness, Empathy, Critical thinking, Creative Thinking, Decision Making, Problem Solving, effective Communication, Interpersonal Relationships, Coping with Stress and Coping with Anger, and Dealing With Emotions.

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## CLASS-XII PHYSICS

### VALUE BASED QUESTIONS

**Q: 1.** A child is observing a thin film such as a layer of oil on water show beautiful colours when illuminated by white light. He feels happy and surprised to see this. His teacher explains him the reason behind it. The child then gives an example of spreading of kerosene oil on water to prevent malaria and dengue.

- What value was displayed by his teacher ?
- Name the phenomenon involved ?

**Q: 2.** Ravi is using yellow light in a single slit diffraction experiment with slit width of 0.6 mm. The teacher has replaced yellow light by x-rays. Now he is not able to observe the diffraction pattern. He feels sad. Again the teacher replaces x-rays by yellow light and the diffraction pattern appears again. The teacher now explains the facts about the diffraction and

- Which value is displayed by the teacher ?
- Give the necessary condition for the diffraction.

**Q: 3.** Aditya participated in a group discussion in his school on “Human eye and its defects” in the evening he noticed that his father is reading a book by placing it at a distance of 50 cm or more from his eye. He advised him for his eye check-up.

- Suggest the focal length/power of the reading spectacle for him, so that he may easily read the book placed at 25 cm from eye.
- Name the value displayed by Aditya.

**Q: 4.** Mohit was watching a program on the topic MOON on the Discovery channel. He came to know from the observations recorded from the surface of Moon that the sky appears dark from there. He got surprised and wanted to know the reason behind it. He discussed it with his friends, and they had the reasons as 1. Phenomenon of refraction of light 2. Phenomenon of scattering of light and explained the topic to him in detail.

(i) Name the value that was displayed by Mohit

(ii) what values were displayed by his friends

**Q: 5** A teacher has given three lenses of power 0.5 D, 4 D, 10 D to a student. He is not sure as to which lenses would he use for constructing a good astronomical telescope. So he consults his seniors and the teacher also and constructs a telescope. Later he shows this telescope to the junior classes and explains about the choice of lenses.

- What values has he shown by doing these?
- Which lenses are used as objective and which one as Eyepiece?

**Q: 6.**A person looking at a person wearing a shirt with a pattern comprising Vertical and Horizontal lines is able to see vertical lines more distinctly than the horizontal ones. He shares his problem with his friend who suggests him to go to a doctor immediately.

(i) Name the value displayed by his friend

(ii) what is this defect due to ?

(iii) How is such a defect of be corrected ?

**Q: 7.** Students of class XII big mirrors in their classroom for science fair. the mirrors are so arranged that one can see six images of himself .all the students of other classes who came to see this were very happy and Geeta of class X<sup>th</sup> was determined to know the reason behind it . She went to the library, consulted other students and next day came up with the answer.

- What values were depicted by Geeta ?
- Give the reason for seeing six images?

**Q: 8.** A child uses a semi conductor device in listening radio & seeing pictures on T.V. He was asked to suggest the techniques as the cost of LPG/CNG is going up, to cope up with future situations.

- What are the values developed by the child?
- What may be the suitable semi conductor material used for utilization of maximum solar energy with reasons?

**Q: 9.** Ruchi's uncle who was a kabadiwala was getting weak day by day. His nails were getting blue, he stated losing his hair. This happened immediately after he purchased a big container of heavy mass from Delhi University Chemistry Department. Doctors advised him hospitalization and suspected he has been exposed to radiation. His uncle didn't know much about radiations but Ruchi immediately convinced her uncle to get admitted and start treatment.

(i) What according to you are the values utilized by Rama to convince her uncle to get admitted in hospital

(ii) Name the radioactive radiations emitted from a radioactive element

**Q: 10.** Medha's grandfather was reading article in newspaper. He read that after so many years of atomic bombing in Hiroshima or Nagasaki, Japan National census indicated that children born even now are genetically deformed. His grandfather was not able to understand the reason behind it. He asked his Granddaughter Medha who is studying in class XII science. Medha sat with her grandfather and showed him pictures from some books and explained the harmful effects of radiations.

(i) What are the values/ skills utilized by Kajal to make her grandfather understand the reason of genetic deformity?

(ii) Name the nuclear reactions that occurred in atom bomb.

**Q: 11.** Muthuswami a resident of Kundakulam was all set to leave everything and shift to another place in view of the decision of Govt. to start nuclear thermal power plant at Kundakulam. His granddaughter Prachi, a science student, was really upset on the ignorant decision of her grandfather. She could finally convince him not to shift, since adequate safety measures to avoid any nuclear mishap have already been taken by the Govt. before starting nuclear thermal plants.

- What is the value displayed by Prachi in convincing her grandfather
- What is the principle behind working of nuclear reactor
- What are the main components of nuclear reactor
- Why is heavy water used as moderator?

**Q: 12.** Nisha's uncle was advised by his doctor to get an ECG for his heart, Her uncle did not know much about the details & significance of this Test. She told her uncle that an ECG (Electro cardio

Graph) would enable the doctors to know of the condition of his heart without causing any harm to him. Her uncle was convinced and got the required ECG done. The resulting information greatly helped his doctors to treat him well

- What are the values displayed by Nisha

**Q: 13.** Geeta has dry hair. A comb ran through her dry hair attracts small bits of paper. She observes that Neeta with oily hair combs her hair; the comb could not attract small bits of paper. She consults her teacher for this and gets the answer. She then goes to the junior classes and shows this phenomenon as a Physics Experiment to them. All the juniors feel very happy and tell her that they will also look for such interesting things in nature and try to find the answers. She succeeds in forming a Science Club in her school.

- What according to you are the values displayed by Geeta?

**Q: 14.** Rani's mother who was illiterate was folding her synthetic saree. She saw a spark coming out of it. She got frightened and called Rani. Rani, being a science student, gave the reason behind it. After knowing the reason, her mother calmed down.

- what value was displayed by Rani

**Q: 15.** A picnic was arranged by school for the students of XII class. After some time it was raining heavily accompanied by thundering & lightning. The student got afraid. Some students went inside the room. Two students asked for the key of the car and sat inside the car, folding their legs on the seat. The other students called them to come out but they refused. They knew that the charge inside the conducting shell is zero as told by the teacher and told others not to stand near the electric pole when it is lightning.

- What value was displayed by these students?

**Q: 16.** A semiconductor device is used as a rectifier that allows the EMF to flow in positive direction and a very small value in the reverse direction. Now a days, there is a problem of supply of less voltage that damages the household appliances. You are asked to give the technique to save the appliances in use

(i) What can you think to solve the situation?

- Can a diode be fabricated in terms of Doping, and choice of material to control the input voltage to save your appliances from damage?

**Q: 17.** Chitra was watching her favorite TV serial suddenly the picture started shaking on the TV screen. She asked her brother to check the dish antenna. Her brother found no problem in the dish. Chitra

noticed the same problem in TV picture again after some time. At the same time she heard the sound of low flying air craft passing over their house. She asked her brother again. He explained the cause of shaking picture on TV screen when air craft passes over head.

- Name the values used by Chitra's brother ?
- Why the picture on the TV screen was shaking when air craft was passing over head?

**Q: 18.** Pooja went to the market with her mother and decided to come back home by metro. At Metro station they were made to pass through a gate way for security check. Pooja passed through it and was waiting for her mother to come. She heard a long beep when her mother passed through metal detector. Pooja was confused why metal detector beeped in case of her mother. She asked the duty staff, who explained her in detail. Both were satisfied with the security system.

- What values are displayed by pooja
- What is cause of sound through metal detector
- Write the Principle on which a Metal detector works

**Q: 19.** Mr. Sanjeev, a physics teacher, was doing an experiment in lab using dry cell battery. The dry cell was weak, giving less voltage, which was not sufficient to give proper reading. One of the student asked, "Sir, can't we step-up the voltage using a transformer?" Teacher replied, No, we cannot step up DC voltage using step-up transformer and explained the reason and working of a transformer .the student then constructed a transformer for his Physics project and studied the factors responsible for losses in a transformer.

- What values are displayed by the student
- Why transformer cannot be used to step-up DC voltage

**Q: 20.** Raj Pal Yadav, a retired Physics Teacher was working in his field with his grandson. There was a big high tension tower carrying thick wires in their field. Grandson wanted to know as to why can't the tower be removed from their field, so that they may get more space for crops. Raj Pal explained him the necessity of HT tower, and said it is very high voltage AC transmission line and is a lifeline of their town.

- What values are displayed by Raj Pal Yadav?
- Why Long distance AC transmission is done at very high voltage.
- What is the principle of transformer?
- What are the energy losses in transformer?

**Q: 21.** Rahul after having lived in US for 12years returned back to India. He had a discussion with his cousin Sumit on domestic power supply in US and in India. In US domestic power supply is at 110v, 50Hz, whereas in India it is 220V, 50Hz. Rahul was stressing that US supply is better than Indian supply. Both went to Sumit's father an electrical Engineer and asked his opinion on the issue. He explained that both the supplies have advantages as well as disadvantages.

- What values are used by Rahul and Sumit?
- Write one advantage and one disadvantage of 220V supply over 110V supply

**Q: 22.** One Sunday Rahul and Rama were enjoying with their friends at home. Suddenly their ceiling fan stopped working. Out of sheer enthusiasm Rahul first switched off the power supply of the fan and opened the cap of the fan to check the problem. Vipin tried to stop him but he did not listen. The moment he touched the interior part of the fan, he fell down because of electric shock. All friends were scared as to what has happened as the power supply was already switched off.

i) What negative trait do you think has been displayed by Rahul?

ii) What could be the possible cause of electric shock?

iii) Write expression of current and emf of the component used in fan with phase difference.

**Q: 23.** Sandeep's mother had put lot of clothes for washing in the washing machine, but the machine did not start and an indicator was showing that the lid did not close. Sandeep seeing his mother disturbed thought that he would close the lid by force but realized that the mechanism was different. It was a magnetic system. He went to the shop and got a small magnetic door closer and put it on the lid. The machine started working. His mother was happy that Sandeep helped her to save Rs.300/- also.

- What was the value developed by Sandeep?
- What values did his mother impart to Sandeep?
- Every magnetic configuration has a north pole and a south pole. What about the field due to torpid

**Q: 24.** Two girls Pooja and Ritu were very good observers and performed in the school function using their cassette player. One day when they were performing, tape got stuck up and the music stopped. But Pooja was determined not to let down the performance so she sang the song instead of dancing and Ritu completed the dance.

- What were the values displayed by Pooja and Ritu?
- What kind of Ferro magnetic material is using for coating magnetic tapes used in cassette players or building memories stories in modern computers?

**Q: 25.** Tushar was using a galvanometer in the practical class. Unfortunately it fell from his hand and broke. He was upset, some of his friends advised him not to tell the teacher but Tushar decided to tell his teacher. Teacher listened to him patiently and on knowing that the act was not intentional, but just an accident, did not scold him and used the opportunity to show the internal structure of galvanometer to the whole class.

(i) What are the values displayed by Tushar.

(ii) Explain the principle, Construction and working of moving coil galvanometer.

**Q: 26.** Group discussion was arranged in class XII on the topic atmosphere. Three groups were made. Teacher asked the Question. "Why can moon be not used as a communication satellite?" Answers were

given by all the three groups. Each group can give only one reason. Teacher told them that reason given by each group is correct. The groups collected all the three reasons and come to correct conclusion.

(i) What values were showed by all the three groups?

(ii) Give the correct reason for the above question.

**Q: 27.** Lot of people like TV program CID. In this program there is some murder mystery which has to be solved by the team of CID people. Every member of CID team work with full dedication. They collect information from everywhere which can lead to correct conclusion. They use ultraviolet rays in forensic laboratory. Some people got surprised to see the advantage of ultraviolet rays because they only know that that ultraviolet rays coming from SUN are harmful .

- What values were displayed by CID team?
- Give the use of Ultraviolet rays in forensic laboratory

**Q: 28.**Deepa's uncle wants to talk to his son in USA. He does not have much money to spend on telephone calls. He has a computer at his home. Deepa told her uncle that he can talk to his son with the help of computer and told him about internet. Her uncle now talks to his son every day. He thanked Deepa for giving useful advice.

- What according to you are the values displayed by Deepa.
- How does internet network?

**Q.29.** In an experiment of photoelectric effect, Nita plotted graphs for different observation between photo electric current and anode potential but her friend Kamini has to help her in plotting the correct graph. Neeta Thanked Kamini for timely help.

a) What value was displayed were Kamini and Neeta.

b) Draw the correct graph between I and V (NCERT)

**Q: 30.** A function was arranged in the school auditorium. The auditorium has the capacity of 400 students. When entry started students entered in groups and counting becomes a great problem. Then science students took responsibility at the gate. All the students entered the hall one by one. This helped them to maintain discipline and counting became easy with the help of a device used by these students.

(i) What value is displayed by science students?

(ii) Name the device which is based on application of photoelectric effect.

**Q: 31.** Monica's mother was heating food on a gas stove. Her friend Deepti came and saw her mother heating food on the gas stove. Deepti told Monica's mother, "Why don't you buy a microwave oven"? Monica's mother replied at once that she doesn't like to use microwave oven. Monica and Deepti made it clear that microwave is not harmful for cooking food. This is an easy and safe process. Monica's mother got convinced and ordered for a microwave oven. Monica's mother then arranged a small party for her friends and told them the advantages of a microwave oven.

- What value was displayed by Monica and her friend?
- What value was displayed by Monica's mother?
- What value was displayed by Monica to her friends?

**Q: 32.** Renu has to take admission in some professional college. It was last date of admission and Renu left her birth certificate at her home. College was very far from the home. She called her brother and he faxed the birth certificate. She got the admission and thanked her brother.

- What value was displayed by Renu?
- What value was displayed by her brother?

**Q: 33.** Two boys were going to the market. They saw two welders using welding machine. One welder is using the goggles and face masks with window in order to protect his face. The other one is welding with naked eye. They went to the welder who was not using face mask and explained him the advantages of goggles and masks. Next day the welder bought a set of goggles. He created awareness among other welders.

- What values were displayed by two boys?
- What values were displayed by welder?

**Q: 34.** Mrs. Gupta family was fast asleep during Night. They had no clue that their living room has caught fire due to a short circuit. Suddenly they heard sound of alarm and woke up. They were surprised to see that the sound was coming from the model of fire alarm prepared by their son. They were all happy that a small science model has saved their life

(i) Give the values displayed by the parents and son.

(ii) Name the device used in the model.

**Q: 35.** Mrs. Thakur left her car headlights on while parking. The car would not start when she returned. Seeing her struggle, Mohit went to her help. Not knowing much about cars, he ran and brought a mechanic Raju from a garage nearby. Raju realized that the battery had got discharged as the headlight

had been left on for a long time. He brought another battery and connected its terminals to the terminals of the car battery to get the engine started. Once the engine was running, he disconnected this second battery. This is known as “JUMP STARTING”. Mrs. Thakur thanked both Mohit and Raju for helping her.

(i) What values did Mohit have?

(ii) A storage battery of emf 8.0 volts and internal resistance 0.5 ohm is being charged by a 120 volt DC supply using a series resistor of 15.5 ohms. What is the terminal voltage of the battery during charging? What is the purpose of having a series resistor in the charging circuit?

**Q: 36.** RenuRitu and Kajal lived in a resettlement colony where they observed most houses stole power from transmission lines using hooks. They had learnt in school about fire caused due to electric short circuit. They decided to make people aware of the risks involved and also the importance of paying their electricity bills. They got all their friends and responsible elders together and with the help of the electricity board, succeeded in changing the situation.

- What values did Renu, Ritu and Kajal have?
- A low voltage supply from which one needs high currents must have a very low internal resistance, why?
- A high tension supply of say 6 KV must have a very large internal resistance. Why?

**Q: 37.** Rahul and Rohit bought an electric iron. They had a 2 pin plug. Rahul was keen to start using the new iron with the 2 pin plug. However, Rohit insisted that they buy a 3 pin plug before using it. Rahul got angry. Rohit patiently explained the importance of using a 3 pin plug and the earthing wire. He said that if the metallic body of the iron came in contact with the live wire at 220 volts, they would get an electric shock. If earthed, the current would go to the earth and the potential of the metallic body would not rise. The iron would then be safe to use. Hearing Rohit, Rahul calmed down and agreed.

- What values did Rahul and Rohit have?
- Which has greater resistance – 1 K watt electric heater or 100 watt electric bulb, both marked 220 volts?

**Q: 38.** Sachin had gone to meet his grandfather who was staying in a village. In the evening, they were both watching TV, when suddenly the lights went off. Grandfather told Sachin that the fuse must have blown up as all their neighbors had electricity. Luckily Sachin knew how to change a fuse. His grandfather was happy and told him that if he had been alone, he would have had to spend the night in the dark without a fan. Sachin felt and made up his mind to replace the fuse with a circuit breaker which uses a solenoid with a core so that his grandfather would not have any problems in future.

- What values did Sachin have?
- The main power supply of a house is through a 5 ampere fuse. How many 100 watt bulbs can be used in the house simultaneously at 220 volts?

**Q: 39.** While watching Discovery Channel, Sheela was impressed that certain organisms have the ability to sense the field lines of earth's magnetic field. They use this ability to travel from one location to another. Sheela wanted to find the angle of dip at her place. She got a magnetic compass, using which she found the magnetic meridian. She then mounted the compass on a cardboard and placed it vertically along the magnetic meridian. She was able to measure the angle of dip.

- What values did Sheela have?
- Define the magnetic elements of the earth.

**Q: 40.** Shama, a science student, while studying, was impressed that the nervous system in animals depends on the electrical signals to work. Neurons pass on signals from sense organs to the brain. The passage of an electrical signal constitutes an electric current. Shama was curious to know the range of currents in different situations. She found that current in domestic appliances is a few amperes. During lightning, the electric current is in tens of thousands of amperes, while in the nervous system, it is only a few microamperes. She further discussed with her teacher about the magnitude of the magnetic field created by these currents.

- What values did Shama have?
- A galvanometer coil has a resistance of 15 ohms and the meter shows full scale deflection for a current of 4 milliamperes. How will you convert the meter into an ammeter of range 0 m- 6 amperes?

**Q: 41.** The number of electrical generators used in areas where small workshops existed created a lot of pollution. Rishab and his five friends did a survey and realized that like in multistoried apartments, a common generator could be set up for all these small workshops so that the noise and air pollution could be reduced considerably. They had a tough time convincing the local bodies and now they are going to the NGOs and some financiers to help them organize funds to do the needful. It is admirable to see their perseverance.

- What values did Rishab and his friends have?
- Kamla pedals a stationary bicycle, the pedals of which are attached to a 100 turn coil of area 0.10 sqmetres. The coil rotates at half a revolution per second and is placed in a uniform magnetic field of 0.01 Tesla perpendicular to the axis of rotation of the coil. What is the maximum voltage generated in the coil?

**Q: 42.** Alka and her sister were watching a movie in which the phenomena of aurora borealis was shown. Alka could not believe her eyes that such a colorful display like the one during commonwealth games could be created by nature. She went to the library, but could not find the right book. So she consulted her teacher who guided her. Hence, Alka understood that during a solar flare, a large number of electrons and protons are ejected from the sun. Some of these get trapped in the earth's magnetic field and move in a helical path along the field lines. As the density of the field lines increases near the poles, these particles collide with atoms and molecules of the atmosphere emitting green and pink light. Alka shared this knowledge with her class when they studied the chapter of moving charges in magnetic field.

- What values did Alka have?

- What is the radius of the path of an electron moving at a speed of  $3 \times 10^7$  m / sec in a magnetic field of 6 Gauss perpendicular to it? What is its frequency? Calculate its energy in kilo electron volt.

**Q: 43.** Renu saw her aunt suffering from severe joint pain. Her aunt could not take any pain killer as she was allergic to them. Renu in her quest to help her aunt found the use of magnets. She read Dr. Philpott's work on magnetic therapy, that most people are negative magnetic field deficient due to electromagnetic pollution. Supplementing the body with negative field energy has shown to restore balance and encourage healing. Renu takes her aunt to the doctor daily without fail for the treatment. Her aunt is improving at a phenomenal speed.

(i)What values does Renu have?

(ii)A short bar magnet has a magnetic moment of 0.48J/T. Give the direction and magnitude of the magnetic field produced by the magnet at a distance of 10cm from the centre of the magnet on a) axial line b) the equatorial line of the magnet.

**Q: 44.** Raju was enjoying TV programme at his home with his family at night. Suddenly the light went off causing darkness all over. Mother asked Raju to bring candle along with matchstick from kitchen to put the TV switch off. Raju at once picked the mobile phone and pressed the button lighting up the surrounding. Her mother was surprised and asked where from the light was coming. Raj proudly showed her the mobile.

- Which value is displayed by Raju ?
- Which material is used in LED ?

**Q: 45.** Garima and Gaurav want to purchase a new TV set. They visited electronic shops to look for some branded TV. The dealer showed them LCD and LED TV, s. Now they were confused which set to buy. Finally after discussing with friends, reading relevant literature and searching the internet, they decided to purchase LED.

- Which value is being highlighted I by Garima and Gaurav?
- What is the difference between LED and LCD?

**Q: 46.** Vikas was reading semi conductor in physics. His teacher has explained that electronic components operate at very low voltage. But at home he daily saw his father using wall socket for charging mobile.(220V) Confused Vikas put his doubt in front of his teacher and was satisfied. Next day he went to school and shared the information with his classmates.

- Name the values displayed by Vikas?
- What is the principle of charger?

## **Answer key (Physics):**

**(1)**

(i) Value –appreciation of Nature

(ii) Interference of light

**(2)**

(i) Motivation

(ii) As the wavelength of x-rays is much smaller than that of yellow light, so the diffraction pattern is lost when the yellow light is replaced by x-rays

**(3)**

(i) As the person wants to read a book placed at 25 cm, so if  $u = -25$  cm than its image should be formed by spectacle lens at  $v=50$  cm, so that the defective eye may focus it on retina.

$$\frac{1}{u} = \frac{1}{v} - \frac{1}{f} \quad \frac{1}{-25} = \frac{1}{50} - \frac{1}{f} \quad \frac{1}{-25} - \frac{1}{50} = -\frac{1}{f} \quad \frac{1}{-25} - \frac{1}{50} = -\frac{1}{f} \quad \frac{1}{-25} - \frac{1}{50} = -\frac{1}{f} \quad \frac{1}{-25} - \frac{1}{50} = -\frac{1}{f}$$

F      v      u      (-50)   (-25)   25      50      50

$F = +50$  cms (convex lens) = 0.5 m

Power of lens  $p = 1/f = 2$  D

ii) Compassion for others

**(4)**

(i) curiosity

(ii) Sharing of knowledge

**(5)**

(i) curiosity, sharing of knowledge

(ii) Out of these three lenses, he will use a lens of power 0.5 D for objective lens and lens of power 10D as the Eyepiece

**(6)**

- Empathy
- This defect is called ASTIGMATISM ( DETAILED ANSWER IN THE CHAPER ON OPTICS )
- Can be corrected by using a cylindrical lens

**(7)**

(i) Determination and Critical Thinking

(ii) Two adjacent walls inclined at 90 degree will give three images and the ceiling will repeat them

**(8)**

(i) Awareness of social problems, Generates new idea with fluency.

(ii) See NCERT at Page No 49&490

**(9)**

(i) Value displayed - awareness, critical thinking, decision making

(ii) X ray and Gamma rays.

**(10)**

(i) Sympathy, compassion

(ii) Nuclear- fission reactions

**(11)**

(i) Awareness, social responsibility

(ii) Controlled chain reaction

(iii) Nuclear Fuel, Moderator, Control rods, Coolant, Shielding

(iv) Neutrons produced during fission get slowed if they collide with a nucleus of same mass. As ordinary water contains hydrogen atoms so it can be used as a moderator. But it absorb neutron at a fast rate. To overcome this difficulty, Heavy waters is used as a moderator which has negligible cross sections for neutron absorption

**(12)**

(i) Values- Empathy, helping, caring

**(13)**

(i) values- Curiosity, leadership, compassion

**(14)**

(i) Awareness & sensitivity

**(15)**

(i) Sharing the knowledge, social awareness

**(16)**

(i) Critical thinking

(ii) Hope for improvement by looking for alternatives

**(17)**

(i) Critical thinking and problem solving

(ii) Low lying air crafts reflect TV signals. Due to interference between direct signal received by antenna and reflected signal the picture on TV shakes

**(18)**

( i) Curiosity, Power of Observation

(ii) & (iii) Resonance (NCERT)

**(19)**

(i) Creativeness, curiosity.

(ii) DC supply does not produce changing magnetic flux in the primary hence no emf is set in the secondary coil of transformer.

**(20)**

( i) Social awareness

( ii) To minimize power loss due to generation of heat.

(iii), (iv) (NCERT, alternating current)

**(21)**

(i) Critical thinking, awareness.

(ii) Advantage the power loss at 220v supply is less than at 110v

Disadvantage 220v supply has peak value 311v which is much higher than peak value of 155.5V for 110v supply

**(22)**

- Careless attitude towards life.
- Capacitor
- NCERT Chapter on Alternating Current

**(23)**

i) Sympathy, responsibility, nature of helping, self-reliance

ii )Appreciation, thankfulness, economical nature.

iii )NCERT page 179

**(24)**

- Team spirit, confidence, determination and courage.
- NCERT Page 202 Ex 5.17(d)

**(25)**

(i) Courage to tell the truth, Gratitude to his teacher for her patience and tolerance

(ii) NCERT Pg.157

**(26)**

- Brotherhood, team spirit, critical thinking

- NCERT chapter on Principles of Communications

**(27)**

- Team work, Awareness.
- In the detection of forged documents, finger prints.

**(28)**

(i) Caring, creating awareness.

(ii) NCERT

**(29)**

a) sharing and caring

b) Refer NCERT

**(30)**

(i) Sense of responsibility.

(ii) Photo cell.

**(31)**

- Sharing knowledge.
- Understanding.
- Creating awareness.

**(32)**

(i) Awareness

(ii) Understanding

**(33)**

(i) Knowledge

(ii) Awareness

**(34)**

(i) Knowledge, Scientific thinking

(ii) NCERT (photo cell)

**(35)**

- Helpful, aware of his weakness, decision making ability.
- NCERT Q p 128 Exercise 3.11

**(36)**

- Team spirit, critical thinking, decision making, assertive communication.
- NCERT Q p129 Exercise 3.18 c,d
- 

**(37)**

- Rahul is enthusiastic and flexible, Rohit is patient, knowledgeable, assertive,
- Compassionate and mature.

**(38)**

(i) Empathy, dutifulness, determination, responsibility, compassion.

(ii)  $I = P / V = 100 / 220 = 5/11$

No. of bulbs =  $5 / (5/11) = 11$

**(39)**

- Nature of appreciation, curiosity, diligence, self-reliance, creative skill.
- NCERT p 186

**(40)**

(i) Curiosity, nature of appreciation, critical thinking, research oriented mind and ambitious.

(ii) NCERT p 172 exercise 4.28

**(41)**

(i) Team spirit, patience, tolerance, magnanimity, determination, responsibility and dutifulness.

(ii) NCERT p 226 example 6.11

**(42)**

- Nature of appreciation, diligence, curiosity, research mindedness, communicative skills,
- NCERT p 139 example 4.3

**(43)**

- Love, sympathy, punctuality and regularity, diligent, maturity and responsibility.
- NCERT Q page201 exercise5.12

**(44)**

(i) Creative thinking

(ii) NCERT (SEMI Conductors)

**(45)**

(i) Interpretation skill

(ii) NCERT (SEMI Conductors)

**(46)**

( i ) Scientific thinking

(ii ) Rectifier