



**ZIAUDDIN UNIVERSITY**  
EXAMINATION BOARD

**RESOURCES FOR**  
**“SSC-II GENERAL SCIENCE”**  
**ZUEB EXAMINATIONS 2021**



## **PREFACE:**

The ZUEB examination board acknowledges the serious problems encountered by the schools and colleges in smooth execution of the teaching and learning processes due to sudden and prolonged school closures during the covid-19 spread. The board also recognizes the health, psychological and financial issues encountered by students due to the spread of covid-19.

Considering all these problems and issues the ZUEB Board has developed these resources based on the condensed syllabus 2021 to facilitate students in learning the content through quality resource materials.

The schools and students could download these materials from [www.zueb.pk](http://www.zueb.pk) to prepare their students for the high quality and standardized ZUEB examinations 2021.

The materials consist of examination syllabus with specific students learning outcomes per topic, Multiple Choice Questions (MCQs) to assess different thinking levels, Constructed Response Questions (CRQs) with possible answers, Extended Response Questions (ERQs) with possible answers and learning materials.

## **ACADEMIC UNIT ZUEB:**

## 2. Constructed Response Questions (CRQs)

## HOW TO ATTEMPT CRQs:

- Write the answer to each Constructed Response Question/ERQs in the space given below it.
- Use black pen/pencil to write the responses. Do not use glue or pin on the paper.

## SECTION B (SHORT ANSWER QUESTIONS)

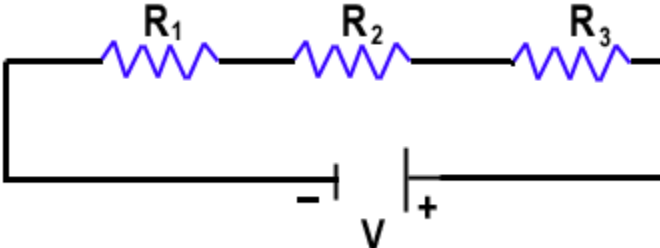
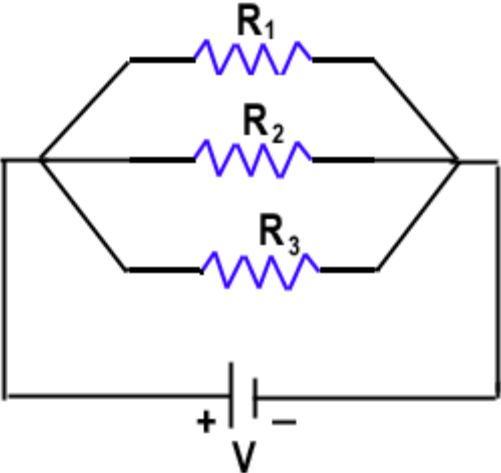
1. Define force with the help of Newton's first law of motion? Prove that Force is the rate of change of momentum?

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

| Chapter | CRQs   | Answers  | CL         | DL          |
|---------|--|--|------------|-------------|
| Energy  | <b>1.What do you mean by Potential Energy?</b> | The Energy which is stored in a body is called potential energy. Often a body appears to have no power or energy to exert force at all. But because of its chemical “make up” or position it may have great amount of energy. Such an energy is stored up energy known as potential energy. For example: Water stored in a dam has large amount of potential energy due to its height above the ground. A stretched rubber band possesses potential energy due to its distorted shape. | <b>U</b>   | <b>80 %</b> |
|         | <b>2.What is Kinetic Energy?</b>               | When a stored up energy is changed into such an energy which is result of motion of the body is known as Kinetic Energy. For example when a still water starts to fall or run through a tunnel it turns the turbines at the base of large dams through the kinetic energy possessed by the water. These moving turbines then move generators to generate electricity.  | <b>K/R</b> | <b>90 %</b> |

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|  | <b>3.Draw a table and describe differences between Kinetic and Potential Energy.</b> | <b>Kinetic Energy (K.E)</b>  | <b>Potential Energy (P.E)</b>                         | <b>U</b>   | <b>80 %</b> |
|  |  | K.E possessed by an object due to its motion.  | Energy possessed by an object due to its position.    |            |             |
|  |  | K.E can be transferred from one object to another.   | P.E cannot be transferred from one object to another. |            |             |
|  |  | The formula to measure K.E involves velocity   | P.E is based on mass, gravity and height.             |            |             |
|  | <b>4.What do you mean by Solar Energy?</b>   | Solar energy is energy from the sun that is converted into thermal or electrical energy. Solar Energy is the cleanest and most abundant renewable energy source available. A device called solar cell can change the energy of the sunlight to electrical energy. Such solar cells are frequently used in calculators, watches etc. Each solar cell has surface made up of two different kinds of crystals. When sunlight strikes these surfaces, electric current flows between the two different crystals. Thus the solar energy is capable to run our machines in homes and industries. |   | <b>U</b>   | <b>90 %</b> |
|  | <b>5.What is Nuclear Energy?</b>   | Nuclear Energy is the energy released from the nucleus of the atom when it is hit or bombarded by a slow moving atomic particle, called neutron. When an atom of uranium 235 was hit by the neutron, it split up into several parts releasing enormous amount of energy. During nuclear reactions energy is released as an example of fission and fusion. Huge amount of heat and energy is released as result of splitting or combining of atoms.   |   | <b>K/R</b> | <b>80 %</b> |
|  | <b>6.List sources of Energy.</b>   | Following are the sources of Energy.<br>1. Conventional Sources of Energy such as fuels, coal, wood, oil natural gas and<br>2. Non-conventional Sources of Energy such as the sun, the wind, the tides, earth, geo-thermal, biomass and the nucleus of the atom.   |   | <b>K/R</b> | <b>90 %</b> |
|  | <b>7.Explain Bio-Mass Energy in your own words.</b>                                  | Biomass is organic, meaning it is made of material that comes from living organisms, such as plants and animals. The most common biomass materials used for energy are plants, wood, and waste. These are called biomass feedstocks. Biomass energy can also be a non-renewable energy source. The energy from these organisms can be transformed into usable energy through direct and indirect means. Biomass can be burned to create heat (direct), converted into electricity (direct), or processed into biofuel (indirect).  |   | <b>U</b>   | <b>80 %</b> |

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| <b>Current Electricity</b> | <b>1. Define Ohm's law.</b>                            | Ohm's law highlights the relationship between electric current and potential difference. It says that "the current passing through a conductor is directly proportional to the potential difference applied across its ends, provided that the temperature and other physical conditions of the conductor are kept safe." George Simon Ohm, a German scientist was the first to verify this statement experimentally.   |   | <b>K/R 90 %</b> |
|                            | <b>2. What is Electric Current?</b>                    | <u>Electric current</u> is a measure of the flow of charge, as, for example, charge flowing through a wire. The size of the current is measured in <u>amperes</u> and symbolized by <i>I</i> . An <u>ampere</u> of current represents the passage of one coulomb of charge per second, or 6.2 billion electrons ( $6.2 \times 10^{18}$ electrons) per second. A current is positive when it is in the direction of the flow of positive charges; its direction is opposite to the flow of negative charges. |   | <b>K/R 90 %</b> |
|                            | <b>3. Explain resistance in your own words.</b>        | Resistance refers to the property of materials that allow the flow of electric current. Resistance certainly opposes the flow of current. Furthermore, the unit of resistance is ohms which is represented by the Greek uppercase letter omega $\Omega$ . Moreover, the resistance depends on the voltage across a particular resistor and the current flowing through it. Resistance refers to a measure of the opposition to current flow in a particular <u>electrical circuit</u> .                     |   | <b>U 80 %</b>   |
|                            | <b>4. Distinguish between open and closed circuit.</b> | <b>Open Circuit</b>   | <b>Closed Circuit</b>   | <b>A 80 %</b>   |
|                            |  | An open circuit is the one where continuity has been broken by an interruption in the path for current to flow.   | A closed circuit is one which is complete, with good continuity of flowing of current throughout. |                 |
|                            | <b>5. Briefly discuss Alternating Current.</b>         | If a current changes its direction many times a second it is known as alternating current or A.C. Such a current can be obtained if a resistor is connected in series with a source of alternating voltage. A.C is most commonly found in mains-wired buildings such as homes and offices. This is because generating and transporting an AC current across long distances is easy.   |   | <b>U 80 %</b>   |
|                            | <b>6. What is a Capacitor?</b>                         | A <b>capacitor</b> is a device used to store electrical charge and electrical energy. It consists of at least two electrical conductors separated by a distance. Capacitors with different physical characteristics (such as shape and size of their plates) store different amounts of charge for the same applied voltage <i>V</i> across their plates.   |   | <b>K/R 80 %</b> |

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| <b>7.Distinguish between combination of resistance in Series and Parallel respectively.</b> | <b>Combination of Resistance in Series</b>  | <b>Combination of Resistance in Parallel</b>   | <b>K/R -U</b> | <b>70 %</b> |
|   | If different resistances are joined with each other such that there is only one path for the flow of electric current then the combination of such resistances is called Series Combination.  | If there are more than one path for the flow of current in a circuit then the combination of resistances is called Parallel Combination. |               |             |
|   | In series combination current through each resistor is constant.  | In parallel combination current through each resistor is different.  |               |             |
|   | In series combination Potential difference across each resistor is different depending upon the value of resistance.  | Potential difference across each resistor is constant.   |               |             |
|   | Equivalent resistance of circuit is equal to the sum of individual resistances.   | Equivalent resistance of circuit is always less than either of the resistances included in the circuit.                                  |               |             |
| <b>8.Draw a diagram showing combination of resistance in Series.</b>                        |   |  | <b>U</b>      | <b>80 %</b> |
| <b>9.Draw a diagram showing combination of resistance in Parallel.</b>                      |   |  | <b>U</b>      | <b>80 %</b> |
| <b>10. What do you mean by switches? Define with at least one example.</b>                  | An electrical switch is any device used to interrupt the flow of electrons in a circuit. Switches are essentially binary devices: they are either completely on “closed” or completely off “open”. Switches are commonly used for controlling the |  | <b>K/R</b>    | <b>90 %</b> |

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|                             |  | opening or closing of circuits. For example, a switch is used to turn a lamp on or off  |            |             |
| <b>Basic Electronics</b>    | <b>1.What is Electronics?</b>                    | Electronics is the branch of physics in which different types of work can be performed by controlling the flow of electrons. Importance and usefulness of electronics is visible in our daily life. For example: Radio, TV, computers and other electronic appliances give us a lot of information. Many automatic machines like robot, telephone and mobile phones make our work easier. Electronic devices have been installed in artificial satellites, which keep contact with earth. Biggest achievement of electronics is computer, which helps us a lot in daily life. By using Internet a person can know about all the happenings of the world by sitting in front of his computer in his house.   | <b>K/R</b> | <b>90 %</b> |
|                             | <b>2.What do you mean by p-n junction diode?</b> | A <b>p-n junction diode</b> is a basic semiconductor device that controls the flow of electric current in a circuit. It has a positive (p) side and a negative (n) side. In a pure silicon semiconductor, there's an equal number of holes to electrons. If there are more holes than electrons, then that side is the p-side. If there are more electrons than holes, then it becomes the n-side. When we place a positive side with a negative side together, we get a p-n junction which is also a p-n diode. Therefore, we get the name p-n junction diode.   | <b>K/R</b> | <b>90 %</b> |
|                             | <b>3.Briefly discuss radio.</b>                  | Heinrich Hertz a German Scientist was the first scientist who produced waves through air called radio waves. These waves were always associated with electric and magnetic effects and are therefore called electromagnetic waves. They are also called Hertzian waves after the name of the discoverer. Like light waves, radio waves go out in all directions from their source at the speed of light i.e. 186000 miles per second. In radio the broadcaster's voice changes into carrier wave and the receiver which we call our radio set, receives these waves and converts the radio carrier waves into the original voices. When we tune in, the radio waves are changed into electric current that can operate a loud speaker in the radio. In 1906 human sound was transmitted for the first time through radio. | <b>U</b>   | <b>80%</b>  |
| <b>Space and Technology</b> | <b>1.Briefly describe lasers.</b>                | Laser is light of one colour, one wavelength and is highly amplified. It does not disperse therefore it goes in one direction for longer distance without any significant change in its intensity. Laser was first obtained in 1960 by passing ordinary composite light through a ruby crystal. Laser light generally differs from other light in being focused in a narrow beam, limited to a narrow range of wavelengths (often called "monochromatic"), and  | <b>U</b>   | <b>80 %</b> |

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|  |  | consisting of waves that are in <a href="#">phase</a> with each other. These properties arise from interactions between the process of stimulated emission, the resonant cavity, and the laser medium.   |            |             |
|  | <b>2.What are alpha rays?</b>                        | Alpha particles ( $\alpha$ ) are positively charged and made up of two protons and two neutrons from the atom's nucleus. Alpha particles come from the decay of the heaviest radioactive elements, such as <a href="#">uranium</a> , <a href="#">radium</a> and polonium. Even though alpha particles are very energetic, they are so heavy that they use up their energy over short distances and are unable to travel very far from the atom.  | <b>K/R</b> | <b>90 %</b> |
|  | <b>3.What is the role of technology in Pakistan?</b> | Production of goods and service which make human life easy and comfortable depends upon technology based on science. Fields like computer engineering has led to the invention and large scale production of smaller but more and more powerful computers. A computer can process and sort out a large amount of numerical data in almost no time. Computers are being used everywhere, in homes, factories, banks, schools, laboratories, industries etc. A large number of inventions through technology such as aero planes, radar, digital watches, dyes, robots and computers have changed our lifestyle significantly. Technology is contributing greatly in our everyday life.  | <b>K/R</b> | <b>90 %</b> |
|  | <b>4.What is radio-activity?</b>                     | Radioactivity is the property of some unstable atoms ( <a href="#">radionuclides</a> ) to spontaneously emit nuclear radiation, usually <a href="#">alpha particles</a> or <a href="#">beta particles</a> often accompanied by <a href="#">gamma-rays</a> . This radiation is emitted when the <a href="#">nucleus</a> undergoes radioactive <a href="#">decay</a> and is converted into a different <a href="#">isotope</a> which may, according to its number of <a href="#">neutrons</a> and <a href="#">protons</a> , be either radioactive (unstable) or non-radioactive (stable). This “daughter” nucleus will usually be of a different chemical element to the original isotope. In radioactive processes, particles or electromagnetic radiation are emitted from the nucleus. The most common forms of radiation emitted have been traditionally classified as alpha (a), beta (b), and gamma (g) radiation. Nuclear radiation occurs in other forms, including the emission of protons or neutrons or spontaneous fission of a massive nucleus. | <b>K/R</b> | <b>90 %</b> |
|  | <b>5.State at least three uses of ultrasound.</b>    | <ol style="list-style-type: none"> <li>1. Ultrasonic guidance devices are used for the blind, to detect cracks in metal structures to kill bacteria and microorganism in liquid.</li> <li>2. Ultrasonic are also used to obtain cross-sectional pictures in hospitals.</li> <li>3. Ultrasound is also used for cleaning places and objects which cannot be cleaned in</li> </ol>   | <b>K/R</b> | <b>90 %</b> |



|  |  |  |            |             |
|--|--|--|------------|-------------|
|  |  | normal way. Ultrasonic cleaners are used by jewelers and material scientists for cleaning delicate instruments and materials.  |            |             |
|  | <b>6. Define Electrocardiograph.</b>                           | An electrocardiogram — abbreviated as ECG is a test that measures the electrical activity of the heartbeat. With each beat, an electrical impulse (or “wave”) travels through the heart. This wave causes the muscle to squeeze and pump blood from the heart. A normal heartbeat on ECG will show the timing of the top and lower chambers. An ECG gives two major kinds of information. First, by measuring time intervals on the ECG, a doctor can determine how long the electrical wave takes to pass through the heart. Finding out how long a wave takes to travel from one part of the heart to the next shows if the electrical activity is normal or slow, fast or irregular. Second, by measuring the amount of electrical activity passing through the heart muscle, a cardiologist may be able to find out if parts of the heart are too large or are overworked. | <b>K/R</b> | <b>80 %</b> |
| <b>Space and Nuclear Programme of Pakistan</b> | <b>1. Write a brief note on Pakistan’s Space Programme</b>     | The Space Program 2040 is a satellite development and launch program of the Space and Upper Atmosphere Research Commission (Suparco), Pakistan’s space research authority. The Space program 2040 intends to replace the Badr satellite program and geo-stationary communication satellite. On 11 August, Paksat-IR was launched from Xichang Satellite Launch Center by China, making it first satellite to be launched under this program. According to Suparco, five GEO satellites and six low earth orbit (LEO) satellites will be launched between 2011 and 2040.<br>The stated goals of the program are expected to gain significant experience in satellite development, practicing of space medicine, and to promote socio-economic sector in the country.  | <b>K/R</b> | <b>90 %</b> |
|  | <b>2. What is SUPARCO?</b>                                     | SUPARCO is an organization established for Space Research. It stands for space and upper atmosphere research corporation. It has fired several rockets for weather research. It also deals with short and long range weather forecasts.  | <b>K/R</b> | <b>90 %</b> |
|  | <b>3. What do you mean by peaceful uses of Nuclear Energy?</b> | Peaceful purposes include the use of information, technology, material, equipment, and components, in such fields as research, power generation, medicine, agriculture, and industry, but do not include use in, research on, or development of any nuclear explosive device, or any military purpose  | <b>K/R</b> | <b>90 %</b> |
|  | <b>4. Write a brief note on Misuse of Nuclear Energy.</b>      | Misuse of nuclear power could mean terrorists attempting to steal plutonium to make a crude nuclear weapon or to contaminate the environment as an act of blackmail.   | <b>K/R</b> | <b>90 %</b> |



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