खण्ड (ख) विषय : विज्ञान   **अङ्क – ६०**

A. Physics, Geology and Astronomy

1   Mechanics, Heat and Optics
  1.1   Mechanics
    1.1.1   Scalars and vectors
    1.1.2   Kepler's laws
    1.1.3   Verification of acceleration due to gravity
    1.1.4   Newton's laws of motion
    1.1.5   Gravitational potential energy
    1.1.6   Escape velocity
    1.1.7   Altitude, depth and latitude
    1.1.8   Pressure and it's principles
    1.1.9   Moment of inertia
    1.1.10 Elasticity
  1.2   Heat
    1.2.1   First and second laws of thermodynamics
    1.2.2   Molar heat capacity
    1.2.3   Calorimetry
    1.2.4   Heat engines and their efficiency
    1.2.5   Enthalpy and entropy
  1.3   Optics
    1.3.1   Lens maker's formula
    1.3.2   Chromatic aberration
    1.3.3   Telescope and microscope
    1.3.4   Spherical mirrors and their formula
    1.3.5   Wave nature of light
    1.3.6   Newton's rings
    1.3.7   Polarisation of light
  1.4   Numerical problems related to mechanics, heat and optics.
2   Waves, Sound, Electricity, Modern Physics
  2.1   Wave and Sound
    2.1.1   Progressive waves and stationary waves
    2.1.2   Force oscillations and resonance
    2.1.3   Sonometer
    2.1.4   Acoustic of building and reverberation of sound
  2.2   Electricity

      2.2.1   Basic concepts of direct current,

      2.2.2   Resistance, resistivity and conductivity

      2.2.3   Energy and power in d.c. circuit

      2.2.4   Faraday's laws of electromagnetic induction

      2.2.5   Function of generator, dynamo and transformer

      2.2.6   Motor effect

      2.2.7   Threshold energy/frequency

      2.2.8   Self and mutual induction

2.3   Modern Physics

      2.3.1   X-rays

      2.3.2   Fission and fusion.

2.4   Numerical problems related to Waves, Sound, Electricity and Magnetism

3 Geology and Astronomy

    3.1 Geology

      3.1.1   History of the earth

      3.1.2   Geographical diversity/diversion of Nepal

      3.1.3   Rocks and minerals

      3.1.4   Tectonic movement and earthquake

      3.1.5   Natural disasters

      3.1.6   Vulnerability

      3.1.7   Climate change

    3.2 Astronomy

      3.2.1   Solar system

      3.2.2   Satellites

      3.2.3   Solar and lunar eclipse

      3.2.4   Birth and death of stars

      3.2.5   Hubble's law

      3.2.6   Galaxy and constellations

      3.2.7   Brightness of stars

      3.2.8   Pulsars and quasars

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B. Chemistry

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4 Atomic Structure, Periodic Table and Gases

    4.1   Discovery of electron, proton and neutron, Bohr's atomic model, wave mechanical concept, molecular and valance bond theory, hydrogen bonding; entropy change

    4.2   Modern periodic table, characteristics of element on the basis of electronic configuration, physical and chemical properties of elements on the basis of groups and periods, Redox reactions

    4.3   Manufacture of ammonia, nitric acid, sulphuric acid, bromine, iodine, sodium carbonate and sodium hydroxide, Lother-Meyer volume curve

    4.4   Some related numerical problems.

5 Metallurgy and Materials Used in Daily Life

5.1 Extraction, properties and uses of copper, iron, silver, gold, aluminium

5.2 Preparation, properties and uses of plastics, cement, ceramics, glass, pesticides, fibers, soap, detergent and chemical fertilizers.

6 Hydrocarbons

6.1 Aromatic and aliphatic compounds, Alkane, alkenes and alkynes, Preparation of aniline, nitrobenzene, Estimation of nitrogen, Stereo chemistry and isomerism, Alcohol and phenol

6.2 Carbohydrates, proteins and amino acids.

C. Biology

7 Economic Biology and Environmental Science

7.1 Economic plants : medicinal, timber and oil yielding plants

7.2 Apiculture, pisiculture and sericulture

7.3 Physiological system and human (digestive, circulatory, respiratory, excretory, reproductive, skeleton and nervous system), blood groups

7.4 Evolution, mutation, determination of sex, semen bank

7.5 Bio-diversity

7.6 Ecology and ecosystem

7.7 Bio-geo-chemical cycle.

8. Classification and Lifecycle

8.1 Lifecycle of typical algae, fungus, bryophytes, pteridophytes and gymnosperm (spyrogyra, mushroom, moss, cycas and fern)

8.2 Life cycle of mosquito, honey bee, silk worm, ascaris, taenia, snail

8.3 Lifecycle of toad and rice

8.4 Description of some angiospermic families

8.5 Dicot stem, mitosis and meiosis cell division, Mendel's laws of inheritance

8.6 Mechanism of photosynthesis and respiration, structure and function of nucleic acid (DNA and RNA).

विषयगत परीक्षाको प्रश्न योजना (Specification Grid)

एकाइ	पाठ्यक्रमको क्षेत्र	अङ्क विभाजन	विषयगत प्रश्न सङ्ख्या	अङ्क भार
१.	Mechanics, Heat and Optics	१०	१० X १	१०
२.	Waves, Sound, Electricity, Modern Physics	१०	१० X १	१०
३.	Geology and Astronomy	१०	१० X १	१०
४.	Atomic Structure, Periodic Table and Gases	५	१० X १	१०
५.	Metallurgy and Materials Used in Daily Life	५		
६.	Hydrocarbons	५	१० X १	१०
७.	Economic Biology and Environmental Science	५		
८.	Classification and Lifecycle	१०	१० X १	१०
	जम्मा		१० X ६	६०