Government of Jammu and Kashmir,
Services Selection Board,
Zum Zum Building Rambagh, Srinagar.
(www.jkssb.nic.in)

Marks:-150
Time:-2:30 Hours

Syllabus for Written test (Objective Type) for the posts of

Geological Assistant Grade-II and Regional Inspector Grade-II

1. Geomorphology and Engineering Geology (20 Marks)

Landform evolution by mass movements-process, classification, slope failures, subsidence.
Classification of slopes, forms, slope regression, slope maps and slope evolution.
Factors of weathering-mechanical disintegration, chemical decomposition.
Mass movements – causes of hill slope instability, monitoring and control of mass movements
Landslides – types, creep of debris, bending of beds, sheet slides, earth flows, debris flows, landslides
caused by the out washing of sands, landslides in politic rocks, slides of solid rocks, specific types of slope
movements i.e. solifluction and sensitive clays.
Earthquakes – terminology, classification, causes and distribution, engineering consideration of seismicity,
aseismic design of building structures, earthquake problems in India Various stages of geological investigations for civil engineering projects, preliminary investigation,
construction ways and means of investigation, geological surveying, exploratory excavations, trenching,
shaft sinking and tunneling, boring, soil mechanics studies, geophysical methods of exploration
Geological considerations for the construction of roads – lithological characters, geological structures,
weathering, ground water considerations.
Complicated regions for the construction of roads – roads in hilly
regions, roads in marshy regions, roads in water logged areas, roads in permafrost regions, geological
problems after road construction
Geological consideration for the construction of bridges – terminology, stability of bridges, foundation of
Bridges

2. Remote sensing & Groundwater(20 Marks)

Introduction and scope of remote sensing in assessment and evaluation of natural resources,
Remote sensing in groundwater investigation: factors affecting groundwater occurrence.

Indicators for groundwater on remote sensing products and their application examples.
Developments of remote sensing, advantages and limitations of remote sensing.
Role of remote sensing in mineral resources exploration. Main types of mineral deposits. Geological guides
for prospecting and their manifestation in remote sensing data.
Global positioning System (GPS) and its segments, observation principle, parameters effecting the
accuracy of result, main components of a GPS receiver and GPS application.
Surface indicators of groundwater, fracture trace analysis.
Surficial features indicating groundwater on aerial photographs and satellite images. Morphological and
spectral characteristics of different rock groups. Hydrolithological, hydrostructural and hydromorphological
classes and hydrogeological rating.
Different drilling methods used in the construction of shallow and deep wells. Various groundwater
Structures
Different well development and completion methods.
Evaluation of aquifer parameters using Theim's, Thies, Cooper-Jacob and Walton methods. Pump tests
methods data analysis and interpretation of hydrogeologic boundaries.
Determination of aquifer parameters - Pump test; Step-draw down test (SDT), formation and well
characteristics; Slug test.

3. Structural Geology and Geotectonics (20 Marks)

Concept of stress and strain, components of stress, state of stress at a point.
Concepts of stress and strain ellipses and ellipsoids.
Mechanics of folding and buckling. Methods of fold identification in the field.
Nomenclature and age relationship of joints and faults and method of identification in the field
Rock fabric field relations, planar and linear fabric elements (foliation and lineation) and tectonic significance.
Indus-Tsangpo suture zone, Main Central Thrust, Main Boundary Fault, Siwalik structure, Himalayan
Frontal Fault, evolution of Himalaya Concept of continental drift, evidences of movement of continents, modern concept of plate tectonics, fitting of continents together, palaeoclimatic units

4. Paleontology& Stratigraphy(25 Marks)

Groups of trace fossils, borings as trace fossils and bioerosion, traces of predation, fossil tracks and
impressions of vertebrates.
Palaeontological and stratigraphical significance of trace fossils.
Palaeoecological and environmental significance of trace fossils.
Cephalic sutures and vision in trilobites. Faunal provinces and stratigraphic use of
Trilobites with special reference to J&K State.

Stratigraphic classification, litho. bio. and chronostratigraphy, code of stratigraphic nomenclature. Stratification, lateral, vertical and thickness variations and facies variations. Unconformities and their
Recognition
Evolution of Indian shield – major Precambrian belts of India and their tectonic setting
Precambrian of Tethyan basement-Salkhala, Vaikrita Tectonic history and
Palaeozoic life. Of J&K State
Geology of Ladakh with special emphasis on Indus Tsangpo Suture belt
Study of Tertiary rocks- Siwalik Group,Murree Group and Subathu Group and Sirban Limestone their classification and fauna in with special reference to Jammu and Kashmir State

5. Mining Geology(25 Marks)

Geological guides for the prospecting of mineral deposits; mineralogical, lithological and structural guides,
gossans and capping
Geochemical exploration; mobility and geochemical association of elements, primary and secondary
geochemical dispersion patterns.
Classification of resources and reserves.
Distribution of economic minerals and their use in Jammu & Kashmir State.
Methods of sampling - channel, bulk, grab, chip, car, core and sludge. Trenching and pitting method.
Methods of estimation of the reserves for ore deposits
Classification of mining methods, introductory geological and economic aspects of mine planning,
developmental works for underground mining, mode of entry in mines, drift, crosscuts, winz, raise, ore bin
and ore chuites.
Methods of breaking and blasting the rocks, types of explosives used, arrangements of drill holes for
blasting in surface and underground mines.
National Mineral Policy,2008
Elementary knowledge of the Mines and Minerals (Development and Regulation) Act 1957

6. Igneous Petrology, Metamorphic Petrology, Sedimentology(20 Marks)

Nomenclature and Classification of carbonate rocks
Nomenclature and Classification of carbonate rocks
Significance of chemically formed sedimentary structures.
Physical components of carbonate rocks and their origin.
Classification schemes of igneous rocks, Hierarchy of classification, IUGS classification of plutonic and volcanic rocks.
Granite in various tectonic environments.
Petrogenesis of granites: source materials, sediments and metasediments, basalt or andesites.
Ophiolite suite; Andesites and their petrogenesis.
Concept of geochemistry, geochemical classification of elements.
Radiometric dating of single mineral and whole rock by various methods and their limitations
Metamorphic differentiation and anatexis in metamorphic rocks and granite magmas.
The process of metasomatism and its types.
The concept and system of metamorphic facies.

Characters, types and origin of Migmatites

7. Environmental Geology (20 Marks)

Hydrology and pollution - human use of surface and subsurface water and connected problems of water pollution

Environmental impact of mining - hazards of opencast and underground mining

Desertification - causes and extant. Signs of desertification in Himalaya. Measures to combat desertification

Medical Geology – trace elements and health;

(S. A. Raina)KAS,
Secretary,
J&K Services Selection Board,
Srinagar.