VIKRAM UNIVERSITY, UJJAIN (M.P.)

According to UGC Regulation - 2009 and Ordinance 89 (New)

M. Phil. (Geology)

SEMESTER - II

PAPER – I RESEARCH METHODOLOGY **MM. 100**

Unit – I

An over of scientific hypothesis, Modal, Theory and Philosophy of research methodology in context to Earth Science. Selection and formulation of research problem and design. Field methods in Geology: Scale, Topographic map, bearing and Mapping. Attitudes of the Planar and linear features and their standard notations.

Unit – II

Methods of data collection. Primary and secondary data. Observation and tests. Statistical techniques for processing and analysis of data. Sampling – random sampling. Systematic/grid sampling stratified and cluster sampling. Sampling estimates – Central tendency parameters.

Unit – III

Microscopic techniques. Techniques in photomicrography. Staining techniques for distinguishing Calcite – Dolomite. Application of X – ray diffraction data in determination of composition. NORM calculation and interpretation of ACF, AKF diagrams.

Unit – IV

Basic Concepts of photo geology; Methods and criteria for interpretation of aerial photographs. Application of aerial photographs in geological exploration. Basic concepts of remote sensing techniques. Application of satellite imagery in geological, hydrogeological and mineral exploration.

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VIKRAM UNIVERSITY, UJJAIN (M.P.)

According to UGC Regulation - 2009 and Ordinance 89 (New)

M. Phil. (Geology)

SEMESTER - II

PAPER – II A: APPLIED HYDROGEOLOGY **MM. 100**

Unit – I

Concept of aquifers and determination of aquifer parameters. Application and limitation of law of groundwater flow. Well hydraulics – steady and radial flow to wells, boundary effects. Concept of leacky aquifers, Image well and hydraulics of open wells.

Unit – II

Type of well and methods of water well drilling. Design and construction of water well and tube well. Occurrence and potential of groundwater in various geologic provinces of India. water resource evolution studies.

Unit – III

Groundwater Investigation – Hydrogeological and Geochemical surveys. Geophysical method for groundwater exploration. Groundwater development and management – water balance studies. Environmental pollution studies of groundwater.

Unit – IV

Study of aerial photographs and imaginaries and their signification in groundwater investigations. Application of geomorphology in groundwater investigation. Hydrogeological studies of alluvial and basaltic terrains. Hydro – geochemical analysis and interpretation of chemical quality of groundwater.

VIKRAM UNIVERSITY, UJJAIN (M.P.)

According to UGC Regulation - 2009 and Ordinance 89 (New)

M. Phil. (Geology)

SEMESTER - II

PAPER – II B: SEDIMENTATION AND RELATED MINERAL DEPOSITS

MM: 100

Unit – I

Origin of sedimentation, controlling factors of their formation and relative abundance of the common sediments in geologic time. Particle size, shape and petrogenesis of sandstone. Primary and secondary structures of sedimentary rocks.

Unit – II

Dispersion of sediments as shown by mineral composition, shape and size of detrital grains. Cyclic Sedimentation, Pattern and Interpretation. Sedimentation and mineral deposits with relation to the concept of plate tectonic. Mineral deposits associated with chemical sedimentary rock.

Unit – III

Mineral deposits of biochemical sedimentary nature. Major coal forming epochs of the word and the nature of coal seams in different type of basin. Gondwanaland – palaeogeography and reconstruction. Stratigraphy of Gondwana Super group in India and a brief correlation in other continents.

Unit – IV

Comparative study of Gondwana and Tertiary coals of India on the basis of process and product nature. Petrography of Gondwana coals of India. Classification, grade and quality of Gondwana coals of India. Environmental impact assessment of coal mining activity.

VIKRAM UNIVERSITY, UJJAIN (M.P.)

According to UGC Regulation - 2009 and Ordinance 89 (New)

M. Phil. (Geology)

SEMESTER - II

PAPER – II C: REMOTE SENSING & GIS **MM. 100**

Unit – I

Basic concepts of remote sensing; electromagnetic radiation; detectors; requirements for remote sensing , Spectral signatures of minerals and rock. Cameras; line and multispectral scanners, Active and passive microwave imagers. Operation and data procurement by sensors, factors affecting data utility.

Unit – II

Image enhancement Techniques, Interpretative techniques and interpretation of satellite imagery. Interpretation of Images and Radar remote sensing.

Unit – III

Aerial Photography – development, Type of Aerial photograph, cameras. Procedures of Photography, Scale, Vertical Exaggeration, Mirror stereoscope and plotting instruments. Geographical Information System and its application in Geology.

Unit – IV

Application of remote sensing in Environmental Geosciences. Application of remote sensing techniques to mineral exploration, linear feature analysis and their significance, Detection of altered rocks. Remote sensing in planning of regional exploration programmes.

Note - Paper Ist is compulsory. Any two papers from II, III & IV will be opted by the candidate.

21/7/17 21/7/17