

JAMMU AND KASHMIR PUBLIC SERVICE COMMISSION
Solima Srinagar, Kashmir - 190001
Website: jkpssc.nic.in
Email: emp@jkpsc.nic.in

Subject: Filling up of Gazetted posts in Department of Mining, Government of Jammu & Kashmir.

Reference: Department of Mining Letter No. GM-MNG/33/2022-24 dated 07.04.2022 & GM-MNG/33/2022-04 dated 18.04.2022

DIP/J-6727/22

Notification No: 20 -PSC (DR-P) OF 2022
Dated: 05-08-2022

Applications through online mode are invited from the applicants who are domiciled in the Union Territory of Jammu & Kashmir and are possessing the prescribed Academic/ Professional qualification and age for the posts details of which are given in the following para, in terms of Jammu & Kashmir Geology and Mining (Gazetted) Service Recruitment Rules 1992, notified vide SRO 142 of 1992 dated 19.06.1992, "Jammu & Kashmir Probationer (Conduct of Service, Pay & Allowance) and Fixation of Tenure Rules, 2020" notified vide S.O. 192 of 2020 dated 17.06.2020 and the Jammu and Kashmir Public Service Commission (Business and Procedure) Rules, 2021.

MOST IMPORTANT

- Candidates are advised to update their One Time Registration before filling the application form
- The Application Form together with instructions for filling up the Application Forms, will be available at the website of the Commission from 16.08.2022.
- Candidates are advised to go through the instructions and ensure that they meet all the eligibility conditions prescribed for the post before filling the online Application Forms.
- Last date for filling of online Application complete in all respects along with the requisite fee (online mode only) is 09.09.2022.
- The last date for receipt of online applications provided in the notification shall be the cut-off date for determining the eligibility as regards acquisition of domicile certificates, educational or professional qualifications.
- The minimum and maximum age will however be reckoned with reference to 1st January, 2022.
- Candidates can edit some of the fields in their online application form from 16.08.2022 to 12.09.2022 (upto 11:59 P.M) Instructions in this regard will be separately made available on the website.
- Candidates are required to upload all the mandatory prescribed/requisite documents alongwith the online application form.
- In case the mandatory prescribed/requisite documents are not uploaded with the online applications form, the application form/candidate of the applicant is liable to be rejected without any further action.
- Candidates are not required to submit hard copy of the online application form or any other documents to the Commission at the time of filling up of online application form.
- The candidates will however, be required to present/provide a down loaded copy of the online form alongwith original certificates at the time of documentary verification.
- Candidates are advised in their own interest to submit online applications much before the closing date and not to wait till the last date to avoid the possibility of disconnection/unability to pay fee or failure to login to the online application portal on account of heavy load on the website during the closing days.

2. Details of post with category wise breakup is given below

Name of the Post with pay scale	OM	RBA	SC	ST	Total
Geologist (Grade-III) L-18A (54000-108000)	03	01	01	01	06
Driller L-18A (24000-170000)	01	-	-	-	01
Assistant Mining Engineer L-18A (54000-170000)	01	-	-	-	01
Total					08

3. Prescribed Qualification

Designation	Qualification
Geologist (Grade-III)	Master's Degree in Geology/Applied Geology or equivalent from a recognized institute
Driller	i. Degree in Mechanical/Drilling Engineering or ii. Diploma in Mechanical/Drilling Engineering with AMIE. or iii. Matriculate with job training in Drilling Technology from IBM/NCDC/RGVI.
Assistant Mining Engineer	Degree in Mining Engineering or its equivalent from a recognized Institute or Diploma in Mining and three years minimum experience in Metallurgical/Non-Metallurgical/Coal Mining Knowledge of Exploratory Mining and underground Geological Mapping is an Organization of repute.

4. Age as on 1st January 2022

The prescribed age (minimum/maximum) for candidates belonging to Open Merit (OM) & Reserved Categories is as below:-

S.NO	Category	Age limit	Not born after	Not born before
1	OM	40	01.01.2004	01.01.1982
2	RBA, SC, ST	43	01.01.2004	01.01.1979
3	In service candidate	40	01.01.2004	01.01.1982

One time age relaxation is granted to the over-aged candidates who had earlier applied for the posts of Geologist (Grade-III) advertised vide Notification No. 21-PSC (DR-P) of 2012 dated 12.11.2012, and were within the age limit, at that time, but has in the meantime crossed the upper age limit, if he/she applies for the post(s) in pursuance to instant Notification and also need not to pay any fee at all.

5. Reservation

- A candidate seeking his/her consideration under a Reserved Category must ensure that he/she possesses a valid requisite category certificate on the cut-off date.
- The candidature of the candidates will be provisional till the grantiveness of the reserved category certificate is verified by the Appointing Authority.
- Candidates may note that in case a claim for reservation is made on the basis of late/false/fraudulent certificate, he/she shall be debarred from the examination(s) conducted by the J&K Public Service Commission, in addition to any other penal action as may be deemed appropriate.

6. Domicile

The candidate should be a Domicile of the Union Territory of Jammu & Kashmir. The candidate must possess a valid Domicile Certificate issued by the Competent Authority in the prescribed format as on the last date prescribed for submission of online application form.

7. Centre of Examination

- The examination will be held at Srinagar & Jammu centres. All the candidates shall indicate the option for examination centre as indicated above.
- The allotment of centres shall be at sole discretion of the Commission and once a centre is allotted to a candidate, request for a change of centre will not be entertained.
- Information about the Examination indicating the time table and Centre of Examination for the candidates will be uploaded on the website of the Commission about two weeks before the date of examination. If any candidate does not find his/her Roll Number on the website of the Commission, one week before the date of examination, he/she must immediately contact the Commission's Office at Srinagar/Jammu, with proof of having submitted his/her application. Failure to do so will deprive him/her of any claim for consideration.
- Candidate must submit his/her online application form, Email ID and Mobile Number along with his/her Name, Date of Birth and Name of the Examination, while addressing any communication to the Commission. Communication from the candidates not furnishing these particulars shall not be entertained.
- Admit Cards will be available for downloading about two weeks before the date of examination on the official website of the Commission i.e. jkpssc.nic.in. Candidate must bring printout of the Admit Card/Roll Number Slip to the Examination Hall.
- For appearing entry into the centre of examination, in addition to the Admit Card/Roll Number Slip, it is mandatory to carry at least two passport size recent color photographs (not taken earlier than 01.01.2022) and any of the original valid Photo-I.D proof such as:-
 - Admit Card/ E-Admit,
 - Voter's ID Card,
 - Driving License,
 - PAN Card,
 - Passport,
 - School/College/University I-Card
 - Employer ID Card.

8. Scheme of Selection / Examination

- The pattern of Examination shall comprise the following:

- (A) **Written Examination**
- The written examination will be an objective type Multiple Choice Question (MCQ) paper of two hours duration and having minimum 100 questions.
 - There will be negative marking for incorrect answers (as detailed below) for all questions:
 - There are four alternatives for the answers to every question. For each question for which a wrong answer has been given by the candidate, one fourth (25) of the marks assigned to that question will be deducted as penalty.
 - If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answer happens to be correct and there will be same penalty as above for that question.
 - If a question is left blank i.e. no answer is given by the candidate, there will be no penalty for that question.

The Selection shall be made in accordance with the provisions of Rule 4(i)(i) of Jammu and Kashmir Public Service Commission (Business & Procedure) Rule, 2021(reproduced as under):-

A. Written Examination	68 points
B. Performance in the interview/ viva voce test. The candidate shall be asked to deliver a 5 minute presentation/lecture on a given topic from the relevant subject to demonstrate his/ her domain knowledge/ skills and will be assessed and evaluated by the subject experts and the Members of the Commission in the Selection Committee/ Interview Board.	25 points
C. Weightage for Academic Merit/ Higher Qualification in the relevant subject.	Upto a Maximum of 04 points
a. Where Bachelor's degree is prescribed as the minimum qualification	Upto a Maximum of 04 points
i. One year Post Graduate Diploma in the relevant subject (on pro-rata basis)	03 points
ii. Master's/Post Graduate degree in the relevant subject (on pro-rata basis)	04 points
b. Where Master's degree is prescribed as the minimum qualification	Upto a Maximum of 04 points
i. MPhil in the relevant subject	02 points
ii. PhD in the relevant subject	04 points
D. Distinction in Sports (Certified by Secretary, J&K Sports Council to be an outstanding Sports Person in terms of J&K Appointment of Outstanding Sports Person) Rules, 2022	01 point
E. Distinction in NCC activities (Holder of Grade 'C' Certificate)	01 point
F. Special Attributes	
i. Gold Medal for overall first position in the prescribed qualification	1 point
G. Total (A to F)	100 points

The syllabus for the written examination is given in Annexure "A", "B" and "C".

- (B) **Interview/ Viva Voce**
- On the basis of the marks obtained by the candidates in the written examination, an interview/viva voce test will be conducted. The number of candidates called for interview/ viva voce test shall be restricted, as far as practicable, to a minimum of three times the number of vacancies in order of merit. The interview/ viva-voce will have 25 points.

- The written exam will carry Sixty eight (68) points. The marks obtained in the written examination shall be taken into account as pro-rata basis for determining the final merit list.

9. Pardon of Compensatory Time and Assistance of Scribe

On request of a visually impaired (Blind) or any other candidate who is handicapped to the extent that he/she is not able to write, the candidate shall be provided assistance of an amanuensis (Scribe) on production of a Disability Certificate issued by the Medical Board constituted by the Government consisting of CMO of the District and at least two Medical Specialists nominated by the concerned Director, Health Services (with at least one specialist from the field concerned department). After verifying the genuineness of the certificate/satisfying itself, the Commission may provide services of Scribe to the candidate on the day of examination. The scribe should have one qualification down than the requirement for the post applied for by the candidate(s) and further should be from an academic stream different from that stipulated for the post. The scribe shall be paid remuneration charges equivalent to the invigilator.

Provided the concerned Supervisor shall ensure that the scribe provided to the candidate shall not extend any type of help to the candidate in solving the questions. Blind candidates will be allowed an extra time of 20 minutes per hour.

10. Requisite Fee

After successful submission of the online application form, candidate will be required to deposit requisite fee through online mode. The amount of fee to be paid is given below:-

OM Category	Rs.1000.00
Reserved Categories	Rs.500.00
PHC	Nil

Note:

- The application Form submitted without deposition of the fee, which gets substantiated through reflection of the same on the application form, such application form shall be treated as incomplete and candidature shall be deemed to have been rejected without any notice. No representation against such rejection shall be entertained.
- Submission of multiple applications by way of prefixing Mr./Ms or through generation of multiple User ID's or any other mode, followed by either non-payment of fee particulars or fee particulars (TID) of one application (RID) being mentioned against another application with a different RID would lead to rejection of the online application. The applicants who are submitting multiple applications should note that only the applications with higher Registration ID (RID) number shall be entertained by the Commission and fee paid against one RID shall not be adjusted against any other RID number. Besides a strict disciplinary action shall be taken including the cancellation of candidature and debarment for future examinations of J&K PSC will be taken against such applicants.

11. Documents to be uploaded

While filling the online application form the applicants are requested to upload the documents as per details given below:-

Documents (Mandatory):-

- Date of birth certificate (secondary School/ Matric Certificate)
- Domicile Certificate of the UT of J&K.
- Master's Degree / Bachelor Degree / Diploma alongwith consolidated Mark's Card (s) upto 05 Irs.

Documents (Mandatory if claiming benefit under that category):-

- Category Certificate. 01 leaf
- In-service certificate signed by HOD

Any other document for which the candidate is claiming weight age as per J&K (Business and Procedure) Rules, 2021:-

- M.Phil degree certificate alongwith result Notification
- Ph. D Degree Certificate alongwith result Notification
- Experience Certificates, as per format upto 05 Irs.
- "C" Certificate in NCC activities. 01 leaf
- Certificate of Distinction in Sports in terms of J&K Appointment of (Outstanding Sports Person) Rules, 2022
- Gold Medal Certificate for overall first position in the prescribed qualification. 01 leaf
- Post Graduate Certificate minimum 1 year.

It may be noted that no further opportunity to upload any document shall be provided hereafter and action under rules including rejection of application/candidature will be taken. While uploading the documents, the following guidelines, wherever applicable, shall also be kept in view before claiming weightage on such parameters:-

- The weightage available for the Gold Medal(s) shall be for securing the overall first position in the minimum prescribed qualification, in case the convocation for award of Gold Medal has not been convened, a certificate from the competent authority shall be uploaded to the effect that he/she is entitled to Gold Medal for security overall 1st position in the prescribed qualification and shall be awarded the same in the convocation of the University/Institute.
- Foreign Degree shall only be entertained if equivalence Certificate issued by Association of Indian Universities (AIU) is made available.

12. Important instructions regarding filling up of online applications are given herein below:-

- Candidates are required to apply online through the website of the Commission i.e. <http://www.jkpssc.nic.in>. No other means/ mode of application shall be accepted.

- Candidates are first required to go to the JKPSC website www.jkpssc.nic.in and click on the link "One Time Registration" or click on Login menu if you have already created your profile with the JKPSC.

- After logging into your account, candidates are required to fill all the requisite fields of One Time Registration (OTR) i.e. personal information, contact information & educational qualification, service details etc.

- The candidate shall also be required to upload the image of date stamped recent passport size color photograph and signature. The photograph should not be taken earlier than 01.01.2022.

- Size of the photograph (passport size) and signature must be between 10k to 20k in *.jpeg or *.jpg only.

- After successful submission of all the details in your OTR account, check the eligibility conditions as mentioned in the advertisement notification before applying for the post.

- On Clicking on the "show examination" a window will appear on your computer screen. Select the month of the advertisement notification for which you want to apply, a link(s) for the post(s) will appear on the computer screen.

- An "APPLY" button is shown against the respective post and the candidate will click on the APPLY button against the post he/she is eligible.

- On clicking "APPLY" button, an instruction window will appear. Candidates should read instructions carefully before clicking on "APPLY" button at the bottom of the webpage.

- On clicking "APPLY" button, the system will display all facts/particulars that a candidate may have mentioned while filling up the necessary fields of his/her OTR account. Candidate shall fill up the remaining required fields in the application form and accept the declaration thereof.

- Once the candidate is satisfied about the correctness of the filled in details, then, he or she may click on "SUBMIT" button to finally push the data into server with successful submission report.

- On successful submission of the basic details, the candidates will be required to pay the online fee and uploading of the documents, for final submission of the online application form.

- Candidates can pay the requisite fee through online mode in the "SUBMITTED APPLICATIONS" menu in your account.

- After successful payment of the fee, the fee status will get reflected on the Online Application form. Candidates can check the fee status by clicking on the **Print Application Button** in the submitted Applications menu in your JKPSC account. In case the payment status shows either "not submitted or under processing or status has not been reflected on your submitted application form", candidates(s) are advised to contact the JKPSC office at Solima Srinagar/BashamChar Colony Jammu immediately for clarification. Further where the online fee is paid through other service providers the candidate must ensure that not only the amount of fee is debited from his/service provider's Account but also credited into the official account of JKPSC.

- After successful submission of fee, the candidates will be required to upload requisite documents as specified in the advertisement/application form.

- The candidate would be also get the printout of his/her submitted application only after the payment of the requisite fee and uploading of requisite documents.

- Please note that the above procedure is the only valid procedure for applying. No other mode of application or incomplete steps would be accepted and such applications would be rejected.

13. Filling of the online application form

Candidates who have successfully submitted the online application form along with requisite fee will be allowed to edit some of the fields in their submitted online application form within three days after the cut-off date i.e. on 12.09.2022 to 12.09.2022. Detailed instruction in this regard will be made available on the website.

14. Action against candidates found guilty of misconduct

Candidates are advised that they should not furnish any particulars that are false or suppress any material information.

A candidate who is, or has been, declared by the Commission, to be guilty of:

- obtaining by wrongful application of his/her candidature by any means, or
- impersonating or
- procuring impersonation by any person, or
- submitting fabricated documents or documents which have been tampered with or
- making statements which are incorrect, or false or suppressing material information, or
- resorting to any other irregular or improper means in connection with his/her candidature for the selection, or
- using unfair means during the interview, or
- misbehaving in any other manner in the interview, or
- harassing or doing bodily harm to the staff employed by the Commission for the conduct of their test, or
- attempting to commit or, as the case may be, abetting the Commission of all or any of the acts specified in the foregoing clauses may, in addition to rendering himself/herself liable to criminal prosecution shall be liable:
 - to be disqualified by the Commission from selection for which he/she is a candidate, and/or
 - to be debarred either permanently or for a specified period:-
 - By the Commission from any examination or selection held by them.
 - By the Union Territory Government from any employment under them, and
 - if he/she is already in service under Government, disciplinary action can be taken against his/her under the appropriate rules.


(Bashir Ahmad Dar) J&KAS
Secretary
J&K Public Service Commission
 NeoPSC/DR/Drillers/Asstt.Engineer/Geologist-III/MiningDept/22 Dated: 05.08.2022

ANNEXURE "A"

Syllabus
GEOLOGIST
Annexure "A" to Notification No. 20-PSC (DR-P) of 2022 dated 05.08.2022

Physical Geology:-

Principle of uniformitarianism; Origin of the Solar System and the Earth; Geosphere and the composition of the Earth; Shape and size of the Earth; Earth-Moon system; Dating techniques and methods and age of the Earth; Earthquakes; Earth's magnetism and gravity; Isostasy; Basic elements of Plate Tectonics; Organic cycles; Differentiation and internal structure of the Earth; origin of atmosphere, earthquakes and volcanoes; continental drift, sea-floor spreading; geological action of rivers, wind, glaciers, waves; erosional and depositional landforms; weathering processes and products of weathering.

Stratigraphic Geology:-

Orientation of places and lines in space, concept of dip, strike, rake and plunge. Contour lines; Rule of V's and outcrop patterns; Interpretation of geological maps and cross-section construction; Classification and origin of folds, faults, joints, unconformities, foliations and lineations; age relationships; origin and significance of geological structures. Stratigraphic and equal-area projections of places and lines; Numerical problems related to outcrop and bore-hole data. Stress, strain and rheological properties of rocks; Mohr's circle and criteria for failure of rocks; ductile and brittle deformation in rocks; study of isograds; Significance and limitations of α - and β -Diagrams. Geometrical analysis of simple and complex structures on macroscopic scale.

Mineralogy and Petrology:-

Elements of symmetry, notations and indices; Bravais lattices; chemical; Combination of symmetry elements; 22 classes of crystals, spherical and stereographic projections; classification of minerals; Isomorphism, polymorphism, solid solution and modiolite; silicate structures; physical and optical properties of common rock forming minerals- olivine, garnet, pyroxene, amphibole, mica, feldspar and quartz. Orthoscopic and conoscopic study of minerals. Optic figure, optic sign, dispersion, pleochroism and absorption. Descriptive methods in mineralogy: Refractive index, Pleochroism; Temperature stability and mode of occurrence of silicates, native elements, sulphides, oxides, hydroxides and carbonates. Mineral assemblages.

Igneous and Metamorphic Petrology:-

Magma: nature, cooling behavior, properties and chemistry; volatiles in silicate rocks, magmatic crystallization. Magma types and their evolution; IUGS classification of igneous rocks; Forms, textures and features of igneous rocks; association, and genesis of common igneous rocks. applications of binary and ternary phase diagrams in petrogenetic, magmatic differentiation and assimilation; petrogenesis of common types of igneous rocks. Application of major and trace elements (including REE) and Sr-, Pb-, and Nd - isotopes studies in deciphering magma generation, mantle - crust interactions and tectonic environments; Metamorphism in: Limits, types and controls; metamorphic structures- ductile, brittle and greenschist; metamorphic textures- pss, gne and post tectonic; porphyroblastic concept of metamorphic zone, isograds and facies; prograde metamorphism, facies series and plate tectonics. Concept of metamorphism and anatexis. Concept of prograde - ACT, ACF and AFM diagrams; Phase Rule and its applications.

Sedimentology:-

Origin of sedimentary rocks. Types of sandstones and their petrogenesis; Gravelite and Gravelite problem; plate tectonics and sandstones compaction. Argillaceous rocks, their classification and genesis.

Volcaniclastic sediments and their characteristics with reference to Kashmir Himalayas. Limestone and dolomites: classification and petrography. Study of evaporites such as gypsum, and anhydrite. Diagenesis of sandstones, mudrocks and carbonate rocks. Fluid flow concepts and sediment transport. Bedforms and sedimentary structures; Palaeocurrent analysis. Sediment texture, textural parameters and their significance. Tactonic classification of sedimentary basins; Sedimentary facies; Processes and characteristics of depositional environments like Fluvial, Estuarine, Deltaic, Tidal Flat, Lagoonal, Barrier beach and Deep-Sea environments. Concise approach to regional unconformities, paraconformities and system tracts; Allochthon and autogenic controls on sedimentation. Introduction to Quaternary Sedimentology.

Palaeontology:-

Fossils and processes of fossilization; concept of species and binomial nomenclature; morphology and classification and major evolutionary trends as well as different ages of animal groups of Brachiopoda, Mollusca, Trilobites, Caprellolozoa, Anthozoa, Echinodermata, etc. Gondwana plant fossils along with the primary idea of ventricle fossils; evolution and morphological characters in Spizidae and Homalidae; Definition and scope of micropaleontology; Relationship of micropaleontology with ocean sciences; Modern field and laboratory techniques in the study of microfossils (collection, sampling and preserving techniques, scanning electron microscopy and mass spectrometry); micropaleontology in reconstruction of history of past, environmental changes and biostratigraphic correlation. Application of Micropaleontology in hydrocarbon exploration.

Stratigraphy:-

Principles of stratigraphy; Lito-, Chrono- and biostratigraphic classification; Stratigraphic correlation techniques; Archean cratons of Peninsular India (Dharwar, Singhbhum and Anantnag); Proterozoic mobile belts; Stratigraphy of Cuddapah and Vindhyan basins; Stratigraphy of Palaeozoic - Mesozoic of Spiti and Kashmir; Gondwana Supergroup, Jurassic of Kutch, Cretaceous of Trichinopoly, Tertiary and Quaternary sequences of Assam, Bengal and Sivalik. Concept of sequence stratigraphy; brief ideas of magneto-scientific chrono- and event stratigraphy and stratigraphic correlation. Precambrian/Cambrian and Permian/Triassic boundary problem.

Geomorphology:-

Basic concepts and significance of Geomorphology; Cycle of erosion. Concept of karst landscapes; elementary idea about morphogenesis and morphography; Morphometric analysis; Morphochronology; Neotectonics: Geomorphological indicators, active faults, drainage changes, neotectonic tectonicity. Geomorphology of India - Peninsular, extra-peninsular and Indo-Gangetic Plains. Application of Geomorphology in Mineral Prospecting, Civil Engineering, Military purposes, Hydrogeology, and Environmental studies. Concept of Quaternary geomorphology, Introduction to geotectonics; Palaeogeography, polar wandering and reversal of earth's magnetic field; Geomagnetic time scale; Principal Geotectonic features: Features of the Ocean, Continent and Continental margins; Plates and plate boundaries; Principles of Plate Tectonics; Force Balance and Mantle Plume models of plate movements; Orogeny and Epigeny; Anatomy of orogenic Belts; Geodynamic Evolution of Himalaya.

Economic Geology:-

Properties of mineral deposits- form, mineral assemblage, texture, rock-ore association and relationships; magmatic, sedimentary, metamorphic, hydrothermal, pegmatite and weathering related processes of ore formation; processes of formation of coal and petroleum; distribution and geological characteristics of major mineral and hydrocarbon deposits of India. Important metallic, non-metallic and atomic mineral deposits of India. Ore reserve, sequence of temperature of formation, ore variation, complexing and ore

deposition. Mineral resources- time, space, and dynamic controls; resource management concept; mineral economics, present status of resources, resource development and future sources. Mineral economics and National mineral policy; classification of mineral deposits, discovery types, stages of exploration; reconnaissance permits, large area prospecting, prospecting license, mining lease, mineral deposits and host rocks Geological exploration: surface signatures (like stratigraphy, weathering (gross), structures (fold, fault, lineament, shear, breccia). Geochemical exploration: soil, rock, stream sediments, hydrogeochemical, biogeochemical, geobotanical, atmospheric, and electrogeochemical. Drilling technology: percussion, diamond, reverse circulation, air core, wireline, BH deviation survey. Study of following Indian ore deposits with reference to their mineralogy, mode of occurrence, origin, geological association and geographical distribution: iron, manganese, gold, aluminium, chromium, copper, lead, zinc, tin, tungsten, titanium, nickel, molybdenum; felsic, rock, petroleum and radioactive minerals, gemstones

Geophysical Exploration:-

Exploration Geophysics: Basic principles of Geophysics. Detailed knowledge of different types of geophysics methods involving gravity, magnetism & seismology. Gravity methods: introduction, Gravity potential and field due to different simple bodies and structures. Field problems. Bouguer gravity anomalies, interpretations & field-cases. Magnetic methods: introduction, magnetic properties of rocks, geomagnetic field, field procedure, measurement of magnetic anomalies, interpretation. Electrical method: Introduction, Self potential, earth resistivity, different arrays, profiling & sounding techniques, interpretation & field cases. Induced polarisation. Telluric & electromagnetic methods. Seismic method: introduction, refraction methods, layered earth refraction studies, hidden layer problem, correction, instruments, field procedures, interpretation. Various well-logging techniques.

Hydrogeology:-

Ground water, origin, types, importance, occurrence, reservoirs and movement; renewable and nonrenewable groundwater resources; hydrologic properties of rocks: porosity, permeability, specific yield, specific retention, hydraulic conductivity, transmissivity, storage coefficient; Groundwater quality, estimation of parameters; hydrographs; water table contour maps; hydrostratigraphic units. Well hydraulics: confined, unconfined, steady, unsteady and radial flow, water level fluctuations, curative factors and their measurements; methods of pumping test and analysis of test data; evaluation of aquifer parameters. Methods of artificial groundwater recharge; method of rainwater harvesting; problem of over exploitation of groundwater; groundwater legislation; water management in rural and urban areas, salt water intrusion in coastal aquifers; remedial measures. Surface and sub-surface geophysical and geological methods of groundwater exploration; hydrogeomorphic mapping using various Remote Sensing techniques; radioisotopes in hydrogeological studies, concept of watershed management, ground water management technical and social aspects.

Engineering and Environmental Geology:-

Role of engineering geology in civil construction and mining industry. Various stages of engineering, geological investigations for civil engineering projects. Engineering properties of rocks: rock discontinuities, physical characters of building stones, concrete and other aggregates. Geological consideration for evaluation of dams and reservoir sites. Dam foundation, rock problems, geotechnical evaluations of tunnel alignments and transportation routes. Methods of tunneling; Classification of ground for tunneling purposes; various types of support. Geological considerations involved in the construction of roads, railways, bridges and buildings. Improvement of sites for engineering projects. Mass Movements with special emphasis on landslides and causes of hill slope instability. Seismic design of buildings. Influence of geological condition on foundation and design of buildings. Surveying: Surveying, Fundamental Concepts and principles; Primary division and classification of surveys; Common methods of surveying; Reconnaissance survey, Offsetting, Radiation, and triangulation; Open and closed traversing; Leveling. Accuracy and errors in surveying; Basic elements of map preparation and map reading Working principles and use of different Surveying Instruments: Chain, Plane Table, Prismatic Compass, Dumpy level, Theodolite and Total Station. Concept of Global Positioning System (GPS). Concepts of Environmental Geology. Domains of Environmental Geology. Time scales of global changes in the ecosystem and climate. Impact of circulations in atmosphere and oceans on climate and rain fall. Levels of Present and past atmospheric carbon-dioxides. Global warming caused by CO₂ increase in the present atmosphere. Carbon Sequestration. Role of physical, chemical and biological parameters influencing environment. Riverine and marine environments and their important characteristics. Air, water and noise pollution and their major causes. Pollution in the mining areas. Parameters influencing weathering, development of soils and soil profiles. Distribution, magnitude and intensity of earthquakes. Seismic hazard zones. Nontechniques in seismic hazard assessment. Landslide, Floods and volcanic hazards their causes and control. Coastal erosion its causes and control. Problems of urbanisation, human population and their impact on environment. Alternative sources of energy. Waste disposal and related problems. Environmental legislation.