

**Parvatibai Chowgule College of Arts and Science**  
**Autonomous**

B.Sc. Semester End Examination, January/ February 2022

Semester: III

Subject: Geology

Course Title: Operational Geology and Gemmology (SEC)

Duration: 10.00 am- 12.00 pm (2 Hours)

Submission before: 1.00 pm

Max. Marks: 35

**General Instructions:**

**The question paper consists of two sections, A and B**

**Section A:** Students should write down the answers, scan/photograph the same and upload the hand written answer sheets on the Google Classroom.

Typed answer sheets shall not be assessed.

The answer scripts produced by the students will need to have the following information on each answer page submitted:

**Roll No:**

**Subject:**

**Semester:**

**Course Title:**

**Date Session:** Morning/Evening

**Page Number:** (every page must be numbered in the format **page number of total no. of pages eg. 1 OF 6**)

**Student's Signature:**

The entire set of scanned documents must be converted **into a single PDF file** in the ascending order of page numbers before uploading the same on Google Classroom/CLAAP/email to the course teacher. If not, the course teacher will not be held responsible for any missing pages.

The uploaded **file must be named with details of respective Roll Number.**

**Section B:** consist of an exercise to be performed on MS excel

The excel file containing the exercise should also be renamed as **per your Roll number** before uploading.

Or in case of technical difficulty, you may email it to [ssg037@chowgules.ac.in](mailto:ssg037@chowgules.ac.in)

## SECTION A

**Q.I Answer ANY FIVE of the following:**

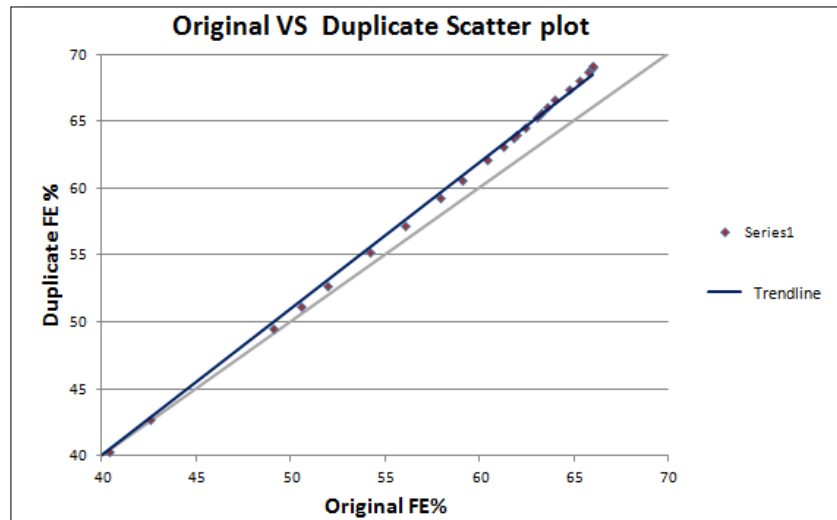
**(15)**

1. What are the reasons for opal to display play of colours?
2. With respect to sapphires, how are they synthesised?
3. Why do certain gemstones change their colour?
4. Given a gemstone ruby, how will you detect it using any three instruments?
5. Explain to which treatment you will subject diamonds for increasing their cost?
6. Why is the round brilliant cut preferred for diamonds?
7. Explain the style of cut preferred for opaque gemstones? Why?

**Q.II Answer ANY THREE of the following:**

**(9)**

1. Describe the core handling procedure before it is broken for sampling.
2. Explain the significance of Quality control and Quality Assurance in drill hole data.
3. Explain the structure of a geological drillhole database.
4. Interpret the plot of Original Versus Duplicate sample analysis given below.



**P.T.O**

## **SECTION B**

**All questions are compulsory, no internal choice provided in this section.**

- The attached excel file ('GWQ\_2010-2018'), contains Groundwater quality data 2010-2018, downloaded from the Central Ground Water Board (CGWB), Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Government of India website: <http://cgwb.gov.in/wqreports.html>
- Download the file and **rename the excel file as per your roll no.**

**Q.III Perform the exercise as per the instructions given below.**

**(5)**

1. On Sheet 2 of the excel workbook, prepare a summary of total number of wells drilled in each year between 2010 to 2018, for each state, using Pivot table option.
2. Plot a bar Graph for the same.
3. In a column next to the pivot table create a field named "Average PH" and using the "AVERAGEIF" function calculate the average Ph value of all well for the respective state.

**Q.IV Create a summary as per the instructions given below for the state assigned to your roll number only:**

**(6)**

SU200017 : Jammu And Kashmir
SU200023 : Arunachal Pradesh
SU200024 : Delhi
SU200033 : Himachal Pradesh
SU200067 : Andaman And Nicobar
SU200087 : Tripura

1. On Sheet 3, prepare a summary table for the state assigned to your roll no, with the 'Tahsil\_name' in first column and average of the chemical parameters namely 'CA', 'K', 'MG' and 'NA' (Ca, K, Mg & Na) in the subsequent columns. An illustration is given below for the state of Goa:

Row Labels	Average of CA	Average of K	Average of MG	Average of NA
<b>Goa</b>	<b>12.16</b>	<b>2.99</b>	<b>6.13</b>	<b>16.17</b>
Bardez	16.83	4.13	6.20	21.98
Bhatkal	2.00	0.50	6.07	7.50
Bicholim	8.78	3.98	3.91	10.33
Canacona	13.40	4.40	8.32	17.28
Haliyal	8.00	3.57	8.50	8.85
Mormugao	55.00	12.45	59.49	331.75
Pernem	9.92	3.44	5.00	12.75
Ponda	9.25	2.72	6.16	12.05
Quepem	8.13	2.57	5.86	9.71
Salcete	13.79	2.77	5.68	16.28
Sampgaon	10.00	5.15	6.07	16.66
Sangeum	5.08	1.25	4.02	5.40
Sanguem	9.49	1.60	5.06	9.66
Satari	9.68	1.74	5.53	12.67
Sattari	5.56	1.07	4.05	5.51
Sawantwadi	8.00	12.92	2.43	8.13
Tiswadi	22.36	2.91	7.11	22.91
<b>Grand Total</b>	<b>12.16</b>	<b>2.99</b>	<b>6.13</b>	<b>16.17</b>

2. Create a Line graph with 'Tahsil\_name' on X axis and add all four parameters 'CA', 'K', 'MG' and 'NA' as separate series.
3. Remove outliers for the plot by filtering the dataset.

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