**ANDHRA UNIVERSITY**
**DEPARTMENT OF GEOLOGY**
**COLLEGE OF SCIENCE AND TECHNOLOGY**

# Scheme of Instruction and Examinations

**M. Sc. GEOLOGY (5 YEAR INTEGRATED COURSE (III-SEMESTER)**

(With effect from the admitted batch 2014-2015)

## NEW SCHEME OF EVALUATION OF PAPERS

### M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)

Scheme of Instruction and Examinations
(With effect from the admitted batch of 2014-2015)

### III - SEMESTER

| S. No | Course | Teaching/Lab Hours Per week | Duration of Examination hours | Allotment of Marks | | Total Marks | Subject Credits |
|---|---|---|---|---|---|---|---|
| | | | | External | Internal (Sessionals) | | |
| 01 | FIG 11: English Language – Paper-III | 4 | 3 | 80 | 20 | 100 | 4 |
| 02 | FIG 12: Second Language (Telugu / Hindi) – Paper-III | 4 | 3 | 80 | 20 | 100 | 4 |
| 03 | FIG 13: Computer Programming – Paper-III | 4 | 3 | 80 | 20 | 100 | 4 |
| 04 | FIG 14: Mathematics – Paper-III | 4 | 3 | 80 | 20 | 100 | 4 |
| 05 | FIG 15: Physics – Paper-III | 4 | 3 | 80 | 20 | 100 | 4 |
| 06 | FIG 16: Geology (Petrology) – Paper-III | 4 | 3 | 80 | 20 | 100 | 4 |
| 07 | FIG 17: Chemistry – Paper-III | 4 | 3 | 80 | 20 | 100 | 4 |
| 08 | FIG 18: Computer Lab | 4 | 3 | 35 | 15 | 50 | 2 |
| 09 | FIG 19: Chemistry Lab | 4 | 3 | 35 | 15 | 50 | 2 |
| 10. | FIG 20: Physics Lab | 4 | 3 | 35 | 15 | 50 | 2 |
| 11. | FIG 21: Geology Lab (Petrology) | 4 | 3 | 35 | 15 | 50 | 2 |
| **TOTAL** | | | | | | **900** | **36** |

***SYLLABUS***

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER- III, ENGLISH LANGUAGE**

**(With effect from the admitted batch of 2014-2015)**

### Poetry Selections

1. Ode to a Nightingale – John Keats.
2. Ulysses – Alfred Lord Tennyson.
3. "Memorabila" – Robert Browning

### Short stories

1. The Lottery Ticket – Anton Chekov.
2. Subha – Rabindranath Tagore.

### Grammar

1. Comprehension from prose.
2. Comprehension from unseen passage.
3. Idioms and Phrases from prescribed text books.
4. Tree Diagram or Pie Chart.
5. Dialogue Writing.

### Assignments

1. In London – M.K. Gandhi.
2. Three Days to see – Hellen Killer.
3. Knowledge Society – A.P.J. Abdul Kalam.

### Text books prescribed

1. **Prose for communication skills** – Published by Ravindra Publilshing House, Guntur.
2. Edited by Prof. M.S. Rama Murtry, Dr. Andal Manga Tayaru, Mrs. Sita Arunachalam, Themia Muri.

### Poetry

The Silent Song – An Anthology of Verse – Published by Macmillan India Ltd., Edited by K.M. Tharakan.

### Short Stories

Vignettes of Life – Edited by Dr. T. Padma – Published by Macmillan India Let.,

### Suggested Books


1. Enrich your communication in English – Lorven.
2. Examine your English Macmillan: Margret M. Masion.
3. Enriching your competence in English – A.R. Thoart, B.S. Valke, S.B. Gokhale.
4. A University Grammar of English – Randolph Quirk Sindey Greebaum

# MODEL QUESTION PAPER

## III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)

### Paper – III, ENGLISH LANGUAGE

### (With effect from the admitted batch of 2014-2015)

**Time: 3Hrs** **Max. Marks: 80**

**I. Answer any TWO of the following in about 200 words each** **2 x 5 = 10 M**

a. Why did Gandhi feel that it was necessary to economize? How did he maintain strict economic discipline?
b. List out the factors that are essential for India to become a superpower by 2010.
c. Whom would Keller like to see on the first day of sight?

**II. Answer any TWO of the following in about 200 words each** **2 x 5 = 10 M**

a. Make a contrast between the world of the nightingale and the real world
b. How does Ulysses view old age and life?
c. Explain and analyze the poem "Memorabilia" written by Robert Browning

**III. Explain THREE of the following with reference to the context in about 8 lines each** **3 x 5 = 15 M**

a. Tasting of Flora and the country green,
Dance and Provencal song, and Sunbrunt mirth

b. Charmed magic casements, opening on the foam
of perilous seas, in fairy lands forlorn

c. 'To follow knowledge, like sinking star,
Beyond the utmost bound of human thought

d. And did you speak to him again?
How strange it seems, and new!

e. How dull it is to pause, to make an end
To rust unburnish'd, not to shine in use!

**IV. Answer any ONE of the following in about 250 words** **1 x 15 = 15 M**

a. Show how the prospect of sudden riches brings out the baser side in the human beings based on the story 'The Lottery Ticket'.

(or)

b. Describe briefly the attitudes of people and parents towards the dumb girl 'subha'.

**(P.T.O)**

**V. A) Read the following passage and answer the questions that follow: 5 Marks**

My hands have lingered upon the living marble of Roman Sculpture as well as that of later generations. I have passed my hands over a plaster cast of Michelangelo's inspiring and heroic Moses; I have been awed by the devoted spirit of Gothic wood carving. These arts which can be touched have meaning for me, but even they were meant to be seen rather that felt, and I can only guess at the beauty which remains hidden from me. I can admire the simple lines of a Greek Vase, but it's figured decorations are lost to me.

1. Who is the 'I; referred in the passage?
2. Who are Michelangelo and Rodin?
3. Why are the varies 'art forms; the author had discussed in the paragraph?
4. Pick out the world from the passage which means 'respect combined with fear and wonder'.

**B) Read the following passage and choose the best answer 5 Marks**

Since time immemorial, jewellery in India has been more of an investment than an accessory. However, the past decade has seen jewellery become a means of self-expression. Today, it must co-relate with four main aspects – the occasion, mood, personality and the outfit, ideally, the adornment must Glamourise a plan, simple look or must be co-ordinated so as to give you a complex yet elegant look. A well-designed piece of jewellery is an interesting price of addition to an ensemble. The look can be made even more stunning with colour infused in the piece, in the form of stones and enamels. Stones mounted (not studded) give a dimensional effect to the piece and make it very eye-catching. Other interesting elements could vary from copper, leather, shells or even sponge. Such value addition to the piece like dimensional heights. carvings, loops etc., depend entirely on your personality and the jewellery designer. A very important but little known aspect is the co-ordination of jewellery, which matches the occasion and your mood. For example, a celebration is marked with a lot of fun and happiness, the mod is vibrate and peppy. Women thus tend to wear more of costume jewellery which can be quite bold and out of the ordinary. You can experiment with different pieces to create and unusual look. During festive occasions, you can experiment with different pieces to create an unusual look. During festive occasions, you can sport heavier pieces of traditional gold jewellery. However, the fit, the colours and the placement of stones make all the difference. There are some important do's and don'ts while selecting jewellery. Your personality and figure play important roles in their process. You can buy a beautiful piece of jewellery but if that piece looks even better when worm it is just the right one for you.

1. What plays an important role in the selection of jewellery?
   a) Its cost b) Its beauty
   c) Your personality and future d) Your outfit

2. Now-a-days, jewellery has become
   a) A means of self expression b) An investment
   c) An accessory d) A wasteful expenditure

3. According to the author, the look of a piece of jewellery can be made more stunning by
   a) Mounted stones b) Copper
   c) Using leather d) The infusion of colour

**(P.T.O)**

4. During festive seasons
   a) A bold piece of jewellery will be appreciated more.
   b) Costume jewellery will look apt.
   c) Heavy pieces of traditional jewellery will suit the festive mood.
   d) You can experiment with different pieces of jewellery.

5. When do women tend to wear costume jewellery
   a) Ordinary occasions
   b) Bold mood
   c) Celebration marked with lot of fun and happiness
   d) Festive mood

**C) Answer any FIVE of the following idioms and phrasal verbs in your own sentences (From the prescribed grammar text prose text) 5 Marks**

a) Torjan house
b) A snake in the grass
c) Let the cat out of the bag
d) Strike while the iron is hot
e) Alpha and omega
f) Look onto
g) Hold on
h) To break down

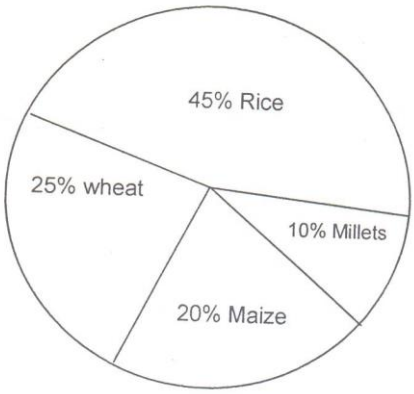
**D) Answer either i) or ii) 5 Marks**

i) Consider the following passage and render it into the form of a tree diagram

There are three kinds of musical instruments. The wind instruments played by blowing air into them. They made of wood and brass, eg: flute and trumpet. The percussion instruments are played by banging or striking. Eg:- drum. The string instruments are played either by plucking them. Eg: Gitar or by drawing a bow across them. EgL - violin.

**ii) Read the following pie chart and writer a neat diagram containing all the information as represented in the chart. 5 Marks**

**<u>Agricultural production in the year 2004-2005 in India</u>**




**E) Answer either a or b 5 Marks**

a) Write a dialogue between two friends on 'Career Choice'.

(or)

b) Write a dialogue between a husband and wife who have won a free pan ticket to visit any India city of their choice.

***SYLLABUS***

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER- III, TELUGU**

**(With effect from the admitted batch of 2014-2015)**

Time: 3 hours Max.Marks:80

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## I. úFyÀdÁ©«s NRPs»R½*LiiM

1. F¡»R½©«s c ªyª«sV©yª«s»yLRiLi, ALiúµ³R¶ª«sV¥¦¦¦Ë³ØgRiª«s»R½Li Fs¬s-sVµ][xqsäLiµ³R¶Li (585c621)
2. N]ßásg][xmsLSÇÁÙ aSÖÁªyx¤¦¦¦©«s -sÇÁ¸R¶VLi c zqs¥¦¦¦xqs©«s µy*ú¼½LibPNRP INRPÉÜ[ @aS*xqsLi (115c165)
3. LRixmnsVV©y´R¶©y¸R¶VNRPV²R¶V c úgkixtsQøLRiVòª«so, ªyÖdÁøNTP ¿RÁLjiú»R½ lLiLi²][ @aS*xqsLi (70c100)

## II. ªyùxqsªyÇÁø¸R¶VLiiM

1. ª«sùQQNTPò»R½* sNSxqsLi c A¿yLRiù LS¿RÁFyÛÎÁLi ¿RÁLiúµR¶ZaP[ÅÁLRilLi²ïT¶
2. @Õ³Áª«sùQQNTPò \®©sxmsoßáùLi c ²y.zms.-s.xqsVËØ÷LSª«so
3. ¾»½ÌÁVgRiVË³ØxtsQ c A¿yLRiù gRiVÇêÁLýRiª«sVW²T¶ NRPXFy¿yLji
4. ª«sWµR¶ùª«sWÌÁNRPV LRi¿RÁ©«s c A¿yLRiù ¸R¶V£qs.ÑÁ.²T¶.¿RÁLiúµR¶ZaP[ÅÁL`i

## III. ªyùNRPLRißáLiiM

(¿³RÁLiµR¶xqsV=) D»R½öéÌÁª«sWÌÁ,
¿RÁLixmsNRPª«sWÌÁ, aSLóRiVÌÁLi

Assignments

ª«sV¾»½[òË³ÏÁLi, NRPLiµR¶Li, ¾»½[ÈÁgki¼½,
AÈÁ®ªsÌÁµj¶.

**xqsLiúxmsµj¶Li¿RÁª«sÌÁzqs©«s úgRiLi´yÌÁV**

1. ¾»½ÌÁVgRiV ªyùNRPLRißá µk¶zmsNRP c ²y.
AÛÍÁ[ÉÓÁ ®ªsWx¤¦¦¦©±slLi²ïT¶, JLji¸R¶VLiÉÞ
ÍØÇÁø©±s,
z¤¦¦¦ª«sV¸R¶V»`½ ©«sgRiL`i,
\|¤¦¦¦µR¶LSËØµR¶V.
2. ËØÌÁ úF¢²³R¶ ªyùNRPLRißá xqsLRi*xqs*ª«sVV c
xqsWöéQQLjiò$
ª«sVx¤¦¦¦¼d½ úgRiLi´R¶ª«sWÌÁ @LRiLi²R¶ÍÞ
}msèÁ c gRiVLiÈÁWLRiV, ®ªsVVµR¶ÉÓÁ
ª«sVVúµR¶ßá, 1970

**MODEL QUESTION PAPER**

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER – III, TELUGU**

**(With effect from the admitted batch of 2014-2015)**

Time: 3 hours Max.Marks:80

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I. **C úNTPLiµj¶ xmsµyùÌÁÍÜ[ lNRPµy¬sNTP xqsª«sWµR¶LRi÷Li }msL]ä¬s úxms¼½xmsµyLôðRi**

**»y»R½öLSùÌÁ©«sV LS¸R¶VLi²T¶**

**1x14=14**

1. NSlLi[ LSÇÁÙÌÁV LSÇÁù ª«sVVÍÞ NRPÌÁVgRi®ªs[ gRiL][*©«sõ¼½Li ËÜLiµR¶lLi[

ªylLi[Lki zqsLjiª«sVWÈÁgRiÈíÁVN]¬s F¡ª«sLiÇØÖÁlLi[ Ë³ÏÁWsV\|ms·

ÛËÁ[\lLi©«sLi gRiÌÁ®µ¶[ bPÕÁúxmsª«sVVÅÁVÌÁLi úÕdÁ¼½©±s ¸R¶VaRPMNSª«sVV\ÛÍÁ

LiVWlLi[ N][LRiVäÌÁV ªyLRiÌÁ©±s ª«sVàáÀÁlLi[ LiVVNSäÌÁª«sVV©±s Ë³ØLæRiªy!

2. Â¿ÁNRPVäÌÁV ¿RÁLiúµR¶ÅÁLi²R¶ª«sVVÌÁV bdP»R½ª«sV{¤¦¦¦µ³R¶LRi»R½VLigRi aRPXLigRiª«sVVÍÞ

ÀÁNRPä¬s ¿RÁ©«sVõµ][LiVV xqsLRi{qsÇÁª«sVV ®ªsWª«sVV ª«sVXßØÌÁNSLi²R¶ª«sVVÍÞ

¿RÁNRPä¬s ËØx¤¦¦¦§ª«soÍÞ ÀÁNRPVLRixqsLi»R½¼½ \ZaPª«sÌÁ xmsLiNTPò¸R¶VLi¿RÁV· µy

LRiNRPVä©«s· ÛÇÁ[LjièLRiLigRi©«sÌÁ ©«sÊÁ÷ÌÁV ®ªs[xqss·gSLi»R½VÛÍÁLi»R½¸R¶VV©±s

II CúNTPLiµj¶ ªyÉÓÁÍÜ[ ©yÌÁVgjiLiÉÓÁNTP xqsLiµR¶LRi÷é xqsz¤¦¦¦»R½ ªyùÅÁùÌÁV LS¸R¶VLi²T¶. **4x3=12**

1. LSÇÁùª«sVV gkiÇÁùª«sVV©±s xqs»R½»R½®ªs[V?
NS¸R¶VLiÊÁV©yFy¸R¶V®ªs[V?
2. ª«sWÈÁ· µj¶LRiVgRiÛÍÁ[LRiV ª«sW©«sµ³R¶©«sVÌÁV
3. ª«sVV¬s}qs¸R¶VV »R½xmsLiÊÁV©«sNRPV NUP²R¶V }qs¸R¶VgRiª«sÌÁ¸R¶VV©±s
4. ryx¤¦¦¦xqsLiÊÁV }qs¸R¶VV ryx¤¦¦¦ryLiNRP
5. @¼½ µk¶LçRi Ë³Øª«sª«sVV ª«sz¤¦¦¦LiÂ¿Á©«sx¤¦¦¦LiÊÁVÌÁ x¤¦Ü[ª«sVx¤¦Ü[úgRi»R½©±s
6. GLji\ZNP©«s ª«sLñjiLixmsLigS· ÇÁ©«sV®©s[

III. 1. ªyª«sV©yª«s»yLRi xmsLRiª«sWLóS¬sõ - sª«sLjiLi¿RÁLi²T¶ **11** Marks

(ÛÍÁ[µy)

súNRPª«sWLRiVä¬s gRiVßábdPÌÁª«sVVÌÁV ¾»½ÌÁxmsLi²T¶

2. úgkixtsQø ÊÁVV»R½V ª«sLñRi©«sV gRiVLjiLiÀÁ LS¸R¶VLi²T¶ **11** Marks

(ÛÍÁ[µy)

ËÜ[¸R¶VxmsÛÍýÁÍÜ[ ª«sVV©«sVÌÁV @©«sVË³ÏÁ-sLiÀÁ©«s ®ªs[µR¶©«s©«sV sª«sLjiLi¿RÁLi²T¶

IV. 1. ¾»½ÌÁVgRiV Ë³ØxtsQ úFyÀdÁ©«s»R½©«sV ¾»½ÌÁxmsLi²T¶ **11** Marks

(ÛÍÁ[µy)

ª«sùQQNTPò»R½* sNSxqs úFyª«sVVÅÁù»R½©«sV - sª«sLjiLi¿RÁLi²T¶.

2. úxmsryLRiª«sWµ³R¶ùª«sWÌÁ ¼d½LRiV¾»½©«sVõÌÁ©«sV ¾»½ÌÁxmsLi²T¶

**11** Marks

(ÛÍÁ[µy)

@Õ³Áª«sùQQNTPò \®©sxmsoßØùÌÁ©«sV - saRPµk¶NRPLjiLi¿RÁLi²T¶.

V. CúNTPLiµj¶ xmsµR¶ùFyµy¬sõ gRißásË³ÏÁÇÁ©«s Â¿Á[zqs, ¸R¶V¼½ róy©y¬sõ gRiVLjiòLiÀÁ, G xmsµR¶ùFyµR¶®ªsW

¾»½ÌÁöLi²T¶ **5** Marks

Aµj¶©±s $xqs¼½ N]xmsöV\|ms· µR¶©«sVª«so\|ms xqsLir¡»R½òLki¸R¶VLiÊÁV\|ms·

VI. CúNTPLiµj¶ ªyÉÓÁÍÜ[ INRPµy¬sNTP ÌÁORPQQù ÌÁORPQßá xqsª«sV©«s*¸R¶VLi Â¿Á[¸R¶VLi²T¶ **5** Marks

1. NRPLiµR¶Li 2. ¾»½[ÈÁgki¼½

***SYLLABUS***

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER- III, HINDI**

**(With effect from the admitted batch of 2014-2015)**

I daoho ¹ tulasaIdasa .

pd ¹ maIrabaa[- .

II **gaVaMSa**

1º pUsa kI rat .
2º vahI kI vahI baat.
3º pRqvaIraja kI AaÐKoM .
4º saMsaRit AaOr saaih%ya ka prspr saMbaMQa.

III **Modern Poetry**

1º maatRBaaYaa ko p`it
2º maatRBaUima
3º Asaaok kI icanta

IV Pa~ ¹ laoKna ( iSakayatI p~ ) Complaint Letters

kayaa-layaIna ihndI Termnology

**Assignments**

**vyaakrNa**

**Anauvaad**

**MODEL QUESTION PAPER**

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER – III, HINDI**

**(With effect from the admitted batch of 2014-2015)**

Time: 3 hours Max.Marks:80

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I **inamnailaiKt pVaMSaaoM maoM sao iknhIM dao saMdBa- saiht vyaa#yaa kIijae.** 8x2=16

1º saao[- &anaI saao[- gaunaIÊ jana saao[ data Qyaaina.

tulasaI jaako ica<a Ba[-Ê raga WoYa kI haina..

2º tulasaI saMt sauAMba t$Ê fUila flaih prhot.

[tto yao pahna hnanaÊ ]tto vao fla dot..

3º basaao maaoro naOnana maoM naMdlaala.

maaoohina maUritÊ saa^vairÊ saUritÊ naOnaa banao ibasaala ..

maaor maukuTÊ makrakRt kuMDlaÊ A$Na itlak idyao Baala.

Aqar sauQaarh maurlaI rajaitÊ ]r baOjaMtI maala ..

Cud/ GaMiTka kT saaoiBatÊ naUpur sabad rsaala.

maIra p`Bau santna sauKda[-Ê Bagat baCla gaaopala..

4º yaa b`aja maoM kuC do#yaao rI TaOnaa.

laO maTukI isar calaI gaujairyaaÊ Aagao imalao baabaa naMdjaI ko Caonaa.

diQa kao naama ibasair gayaao PyaarIÊ laOlaohu rI kao[- syaama salaaonaa..

baRndavana kI kMuja gailana maoMÊ naoh lagaa[- gayaao manamaaohna.

maIra ko p`Bau igairQar naagarÊ saundr sauQar rsa laaonaa..

**(P.T.O)**

**..2..**

II **inamnailaiKt gaVaMSaaoM ka saMdBa-¹saiht vyaa#yaa klijae.** 8x2 = 16

1º hlkU ek xaNa AinaiScat dSaa maoM Kda rha. pUsa isar pr AagayaaÊ kmmala ko ibanaa har maoM rat kao vah iksaI trh nahIM jaa sakta.

2º maoro saamanao BaI vahI ¹ ka ¹ vahI savaala hOÊ jaao ]sako saamanao hO. maOM [sa CaoTo ¹ sao Sahr ka garIba Da^@Tr hUÐÊ ijasao BaUlao¹BaTko marIja hI imalato hOM.

III **iksaI ek kivata ka saaraMSa ilaiKe.**

1x16 = 16 1º maatRBaaYaa ko p`it.

2º maatRBaUima.

IV Anauvaadk kI naaOkrI ko ilae p`banQak ko naama pr p~ ilaiKe. 8x1 = 8

**( Aqavaa)**

Aqyaapk kI naaOkrI ko ilae p`QaanaaQyaapk ko naama pr p~ ilaiKe.

**inamnailaiKt SabdaoM ko AMga`jaI maoM ilaiKe.**
8x1 = 8

1º laoKakar
2º raokiDyaa
3º AadoSa
4º paoYaNa
5º saMsad
6º Anau&a
7º laaoksaovaa
8º ]cca nyaayaalaya

**(P.T.O)**

**..3..**

V ihndI maoM Anauvaad klijae.

8x2 = 16

1º Respect your teachers.
2º Nature is the best teacher.
3º India is a Secular Country.
4º Don't make Noise.
5. Wait for me.

6. Give me some water.
7. Birds fly in the sky.
8. Gardener waters plants.

# *SYLLABUS*

## III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)

## PAPER- III, COMPUTER (DATA STRUCTURES)

## (With effect from the admitted batch of 2014-2015)

### UNIT-I

**Overview of Data Structures**: Basic Terminology, Data Types & Variables, Strings and String operations, Algorithms, Complexity of Algorithms, Introductions to Linear and non linear data Structures.

### UNIT-II

**Arrays**: Linear Arrays, Representation of Arrays in Memory,
**Matrices**: Sparse Matrices representations, additions and multiplication of two Sparse Matrices
**Linked Lists**: Representation of Linked Lists, Insertion and Deletion in Linked Lists, Polynomial additions, doubly linked lists.

### UNIT-III

**Stacks**: Linked Representation of Stacks, Application of Stacks postfix, infix, prefix Representation.
**Queues**: Linked Representation of Queues, Insertion and Deletion operations, Circular queue.

### UNIT-IV

**Trees**: Binary Trees, Representation of Binary Trees, Traversing Binary Trees, Traversal Algorithm using Stacks, Binary Search Trees, Insertion and deletion in Binary Trees.
**Graphs**: Representation of Graphs, Graph Traversals, Warshall's Algorithm, Shortest Paths, Linked Representation of Graphs, Minimal Spanning Trees.

### ASSIGNMENTS

**Searching**: Linear Search, Binary Search and their complexity
**Sorting**: Bubble sort, Quick sort, Insertion Sort, Selection Sort, Merge Sort, heap Sort and their complexity.

**TEXTBOOKS:**

Introduction to Data Structures Horohitz & Sahani
C & Data Structures Ashok N. Kamthane

**REFERENCES:**

Data Structures, Seymour Lipschutz and G.A.V. Pai, schaum's outlines Tata McGraw-Hill
Data Structures and Algorithms by Ulman

# MODEL QUESTION PAPER

## III - SEMESTER M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)

### PAPER – III, COMPUTER (DATA STRUCTURES)

### (With effect from the admitted batch of 2014-2015)

**Time: 3Hrs** **Max. Marks: 80**

**Answer all questions**

**All questions carry equal marks**

**UNIT-I** **16 Marks**

1. a. What is Data Structure? Explain different types of Data structures.
   b. Describe Time complexity and Space complexity

**OR**

   c. What is Complexity Algorithm?
   d. Explain Storage of Strings and String Operations

**UNIT-II** **16 Marks**

2. a. Describe Linear Arrays and Representation of Arrays.
   b. Describe Sparse Matrices Representation

**OR**

   c. What is Linked List? Explain linked list operations.

**UNIT-III** **16 Marks**

3. a. What is stack? Explain stack applications with an example

**OR**

   b. What is Queus? Explain queue operations

**UNIT-IV** **16 Marks**

4. a. Explain Insertion and deletion of nodes in Binary Trees
   b. Describe Binary Tree Traversing Methods

**OR**

   c. Explain Directed Graphs and Shortest Path Algorithm
   d. Describe BFS and DFS algorithms

**UNIT-V** **16 Marks**

5. a. Explain Searching algorithm with an example

**OR**

   b. Explain Insertion sort and selection sort
   c. Briefly explain Merge sort algorithm with time complexity

***SYLLABUS***

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER- II, MATHEMATICS**

**(With effect from the admitted batch of 2014-2015)**

## UNIT-I

### MATRICES and SOME TYPES OF MATRICES

Matrices- Equal matrices – Sums of matrices- Products of matrices- Products by partitioning- Triangular matrices- Scalar matrices- Diagonal matrices- The identity matrix – Inverse of a matrix- Transpose of a matrix- Symmetric matrices- Skew-symmetric matrices- Conjugate of matrix-Hermitian matrices- Skew- Hermitian matrices.

Chapters 1 & 2 prescribed book

## UNIT-II

### DETERMINANT OF A SQUARE MATRIX and EQIVALENCE

Determinants of orders 2 and 3 – properties of determinants- Minors and cofactors- Algebraic complements- Rank of a matrix-Non-singular and singular matrices- Elementary transformations- Inverse of an elementary transformation – Equivalent matrices- Canonical sets under equivalence-Rank of a product.

Chapter 3 & 5 of prescribed book

## UNIT-III

### ADJOINT OF A SQUARE MATRIX and THE INVERSE OF A MATRIX

The adjoint- the adjoint of a product-Minor of an adjoint- Inverse of a diagonal matrix-Inverse from the adjoint-Inverse from elementary matrices- Inverse by partitioning-Inverse of symmetric matrices-Right and left inverses of $m$ x $n$ matrices.

Chapters 6 & 7 of Prescribed book

## UNIT-IV

### LINEAR EQUATIONS

System of non-homogenoous equations-Solution using matrices – Cramer's rule-

**Assignments**

Systems of homogeneous equations.

Chapter 10 of Prescribed book

PRESCRIBED BOOK: Schaum's Outline of Theory and Problems of Matrices by Frank Ayres, JR., Scham publishing co. New York.

# MODEL QUESTION PAPER

## III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)

### PAPER – III, MATHEMATICS

**(With effect from the admitted batch of 2014-2015)**

**Time: 3Hrs** **Max. Marks: 80**

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## SECTION-A

**Answer all the following questions** **5x3=15 Marks**
**Each Question Carries equal marks**

1. If the matrix $\begin{bmatrix} \cos\theta & \sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is Singular, then find the value of '$\theta$'.
2. Show that if AB=A and BA=B, then A and B are idempotent.
3. Find the |A|, when A= $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 2 \\ 1 & 2 & 2 \end{bmatrix}$
4. Find the adjoint of the matrix $\begin{bmatrix} 1 & -5 \\ 6 & 2 \end{bmatrix}$
5. Define symmetric, skew symmetric and nilpotent matrix.

## SECTION-B

**Answer any Five of the following questions** **5x5=25 Marks**

6. Show that A = $\begin{bmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{bmatrix}$ is nilpotent of order 3.
7. Show that A = $\begin{bmatrix} i & 1+i & 2-3i \\ -1+i & 2i & 1 \\ -2-3i & -1 & 0 \end{bmatrix}$ is Skew – Hermitian
8. Find the Co-factor matrix of A = $\begin{bmatrix} -4 & -3 & -3 \\ 1 & 0 & 1 \\ 4 & 4 & 3 \end{bmatrix}$
9. Find the rank of the matrix A = $\begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 5 & 1 \\ 1 & 3 & 4 & 5 \end{bmatrix}$
10. Find the Inverse of the matrix A = $\begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & 3 \\ 3 & 1 & 2 \end{bmatrix}$

**(P.T.O)**

11. If A and B are two inverteble matrices of the same order, then Show that $(AB)^{-1} = B^{-1}.A^{-1}$

12. Let A,B be square matrices of order n, then show that adjAB = adj B. adjA

13. Without expanding, show that the equation $\begin{vmatrix} o & x-a & x-b \\ x+a & o & x-c \\ x+b & x+c & o \end{vmatrix} = 0$ has '0' as a root.

## SECTION –C

**Answer any Four of the following questions** **4x10=40 Marks**

14. Let A = $\begin{bmatrix} 1 & 2 & -3 \\ 5 & 0 & 2 \\ 1 & -1 & 1 \end{bmatrix}$ B=$\begin{bmatrix} 3 & -1 & 2 \\ 4 & 2 & 5 \\ 2 & 0 & 3 \end{bmatrix}$ and C= $\begin{bmatrix} 4 & 1 & 2 \\ 0 & 3 & 2 \\ 1 & -2 & 3 \end{bmatrix}$

find i) A+B ii) A-C iii) A(B+C) iv) AB+AC

15. Using Matrix inversion methed solve the system of equations.

$2x - 3y + 5z = 11$

$3x + 2y - 4z = -5$

$x + y - 2z = -3$

16. Let A= $\begin{bmatrix} 1 & 1 & 2 \\ 2 & 2 & 4 \\ 3 & 3 & 6 \end{bmatrix}$. the find a matrix B of rank '2' such that AB=0

17. Find the inverse of A = $\begin{bmatrix} 1 & 3 & 3 \\ 1 & 3 & 4 \\ 1 & 4 & 3 \end{bmatrix}$. by partitioning

18. Solve the system $2x_1+x_2+5x_3+x_4=5$

$x_1-x_2-3x_3-4x_4=-1$

$3x_1+6x_2-2x_3+x_4=8$

$2x_1+2x_2+2x_3-3x_4=2$ using the inverse of co-efficient matrix

19. Reduce the matrix $\begin{bmatrix} 0 & 2 & 3 & 4 \\ 2 & 3 & 5 & 4 \\ 4 & 8 & 13 & 12 \end{bmatrix}$ to Normal form

20. Without expanding the determent, show that $\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3$

***SYLLABUS***

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER- III, PHYSICS**

**(With effect from the admitted batch of 2014-2015)**

**UNIT-I**

## 1. Electrostatics (12 periods)

Gauss law and its applications-Uniformly charged sphere, charged cylindrical conductor and an infinite conducting sheet of charge. Deduction of Coulmb's law from Gauss law Mechanical force on a charged conductor Electric potential – Potential due to a charged spherical conductor, , electric field strength from the electric dipole and an infinite line of charge. Potential of a uniformly charged circular disc.

**UNIT-II**

## 2. Dielectrics (12 periods)

An atomic view of dielectrics, potential energy of a dipole in an electric field. Polarization and charge density, Gauss's law for dielectric medium– Relation between D,E, and P. Dielectric constant, susceptibility and relation between them. Boundary conditions at the dielectric surface. Electric fields in cavities of a dielectric-needle shaped cavity and disc shaped cavity.

**UNIT-III**

## 3. Capacitance (11 periods)

Capacitance of concentric spheres and cylindrical condenser, capacitance of parallel plate condenser with and without dielectric. Electric energy stored in a charged condenser – force between plates of condenser, construction and working of attracted disc electrometer, measurement of dielectric constant and potential difference.

**UNIT-IV**

## 4. Magnetostatics (12 periods)

Magnetic shell – potential due to magnetic shell – field due to magnetic shell – equivalent of electric circuit and magnetic shell – Magnetic induction (B) and field (H) – permeability and susceptibility – Hysteresis loop.

**ASSIGNMENTS**

## 5. Moving charge in electric and magnetic field (13 periods)

Hall effect, cyclotron, synchrocyclotron and synchrotron – force on a current carrying conductor placed in a magnetic field, force and torque on a current loop, Biot –Savart's law and calculation of B due to long straight wire, a circular current loop and solenoid.

# Model Question Paper

## III - Semester M.Sc. Geology (5 Year Integrated Course)

### Paper – III, PHYSICS

### (With effect from the admitted batch of 2014-2015)

**Time: 3Hrs** **Max. Marks: 80**

**Answer all questions**

**All questions carry equal marks**

**UNIT-I**

1. State and prove Gauss theorem in Electro statics. Derive an Expression for the electric field due to uniformly charged Sphere.

**OR**

Define electric potential. Drive an expression for the Potential due to a uniformly Circular disc.

**UNIT-II**

2. What is meant by a dielectric? Discuss the behaviour of a dielectric in a electric field from atomic point of view.

**OR**

Define D,E and P Establish the relation between D,E and P Hence deduce the relation b/w dielectric constant and Susceptibility.

**UNIT-III**

3. Define capacity of a condenser. Mention the facts that affect the capacity of a changed condenser. Derive an Expression for capacity of a pearly Plate condenser.

**OR**

Derive an Expression for the capacity of a spherical capacitor. Obtain an Expression for the electrostatic energy of a charged capacitor.

**UNIT-IV**

4. What is magnetic shell? Define the Strength of the Shell. Deduce an Expression for the Potential at any Point due to magnetic shell

**OR**

Distinguish between Para, Dia and Ferro-magnetic substances obtain the relation b/w magnetic induction B., magnetic intensity H. and intensity of magnetisation.

***SYLLABUS***

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER- III, GEOLOGY (PETROLOGY)**

**(With effect from the admitted batch of 2014-2015)**

## Unit – I

Nature and scope of petrology – definition – classification of igneous, sedimentary and metamorphic rocks and their distinguishing features.

Igneous rocks – classification into plutonic, hypabyssal and volcanic rocks, forms – Lava Flows, Intrusions, Sills, Laccolith, Lopolith, Dykes, Ring-dykes, Cone-sheets, Volcanic Necks, Phacolith and Batholith.

Structures – Vesicular, Amygdaloidal, Block lava, Ropy lava, Pillow, Flow – Jointing, Sheet and Platy, Columnar and Prismatic.

Textures: Definition of structure, microstructure, devitrification, allotriomorphic, hypidomorphic, ophitic, intergranular, intersect, trachytoid, graphic and micropgraphic.

Reaction structures – Coronas, myckatic, orbicular, spherulitic and perlitic.

## Unit – II

Classification of igneous rocks – C.I.P.W. and Tyrrell tabular classification.

Composition and constitution of magma – Crystallisation of magma – Unicomponent, binary system – Eutectic – Solid solutions.

Origin of igneous rocks – Bowen's Reaction Series – Principle, differentiation and assimilation.

Descriptive study of the following igneous rocks – granite, granodiorite, syenite, nepheline syenite, diorite, porphyry, pegmatite, aplite, gabbro, anorthosite, peridotite, pyroxenite, diorite, dolerite, rhyolite, obsidian, pumice, trachyte, andesite, basalt.

## Unit – III

Sources of sediments – mechanical and chemical weathering – modes of transportation – sedimentary environments. Definitions of diagenesis – lithification – cementation stratification.

Sedimentary structures – Types of bedding, surface marks, deformed bedding, solution structures.

Classification of sedimentary rocks – elastic, rudaceous, arenaceous, argillaceous, non-elastic – calcareous, carbonaceous, ferruginous, phosphatic, evaporates. Descriptive study of the following sedimentary rocks – conglomerates, breccias, sandstone, grit, arkose, graywacke, shale, limestone, shelly limestone.

**(P.T.O)**

## Unit – IV

Definition of metamorphism – Agents of metamorphism – Types of metamorphism – Grades and zones of metamorphism. Metamorphic minerals – stress – anti-stress minerals – Structures of metamorphic rocks – cataclastic, schistose, granulose and gneissose.

Textures of metamorphic rocks – Crystalloblastic, palimpsest, xenoblastic and idioblastic.

Classification of metamorphic rocks – Concept of metamorphic facies.

## ASSIGNMENTS

Cataclastic metamorphism of argillaceous and arenaceous rocks – Thermal metamorphism of argillaceous and calcareous (limestone) rocks.

Dynamothermal metamorphism of argillaceous, arenaceous and basic igneous rocks.

Plutonic metamorphism; Metasomatism and additive processes – Definition of anatexis and palingenesis.

Descriptive study of the following metamorphic rocks – Gneiss, schist, slate, phyllite, quartzite, marble, granulite, eclogite, amphibolites, migmatite. Indian rocks: Khondalite, Charnockite.

## TEXTBOOKS PRESCRIBED

1. Mukherjee, P. K. 'A Text Book of Geology'.
2. Huand, W.T. 'Petrology'.
3. Tyrrell, G.W. 'The Principles of Petrology'.

## REFERENCE BOOKS

1. Petrology for students by S.R. Nokolds, Knox and Chinnar.
2. A Text Book of the Sedimentary Petrology by Verma D.C. Prasad.
3. Petrology of the Sedimentary Rocks by J.T. Greensmith.
4. Petrology of the Igneous Rocks by F.H. Match and M.K. Wells.
5. Igneous and Metamorphic Rocks by Turner, F.J. and Verhoogen, J.

## PRACTICAL WORK

Megascopic identification of the following rocks:

I. Granite, granodiorite, syenite, nepheline-syenite, diorite, porphysry, pegmatite, aplite, gabbro, anorthosite, pyroxenite, dolerite, rhyolite, obsidian, pumice, trachyte, andesite, basalt.

II. Conglomerate, breccias, sandstone, grit, arkose, greywacke, shale, limestone, shelly limestone.

III. Gneiss, schist, slate, phyllite, quartzite, marble, granulite, eclogite, amphiblite, migmatite, khondalite, charnockite.

Microscopic identification of the following rocks:

Granite, syenite, diorite, gabbro, pyroxenite, basalt, pegmatite;
Sandstone, limestone, arkose, shale, conglomerate;
Gneiss, schist, phyllite, granulite, khondalite, charnockite.

# MODEL QUESTION PAPER

## III - SEMESTER M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)

### PAPER – III, GEOLOGY (PETROLOGY)

**(With effect from the admitted batch of 2014-2015)**

**Time: 3Hrs** **Max. Marks: 80**

**Answer all questions**

**All questions carry equal marks**

**UNIT-I**

1. (A) Write an essay on the various forms of igneous rocks.

**OR**

(B) Answer the following short note questions:
- i) Sedimentary rock.
- ii) Batholith.
- iii) Corona.

**UNIT-II**

2. (A) Write a detailed account of the classification of igneous rocks.

**OR**

(B) Answer the following short note questions.
- i) Bowen's reaction series.
- ii) Binary system.
- iii) Pegmatite.

**UNIT-III**

3. (A) Enumerate the process involved in the formation of sedimentary rocks.

**OR**

(B) Answer the following short note questions.
- i) Cementation.
- ii) Arenaceous rocks.
- iii) Conglomerate.

**UNIT-IV**

4. (A)What is metamorphism? What are the agencies and types of metamorphism?

**OR**

(B) Write short notes on the following:
- i) Anti-stress minerals.
- ii) Xenoblastic texture.
- iii) Metamorphic facies.

***SYLLABUS***

**III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)**

**PAPER- III, CHEMISTRY**

**(With effect from the admitted batch of 2014-2015)**

## ORGANIC CHEMISTRY

### UNIT-I

Aromatacity: Arenes Coal source of aromatic compounds structure of benzene (Resonance orbital picture of Benzene) concept of aromaticity, mechanism, Huckels Theory, mechanism of electrophilic substitution reactions, orientation effects Alkyl benzenes, naphthalene, anthrocene.

## PHYSICAL CHEMISTRY

### UNIT-II

Chemical kinetics: Definition of terms, rate equation for first second and third order reaction, methods of determination of order, Zero order reaction, effect of temperature on rates, Activation energy, collision theory of bimolecular reaction, Application of chemical kinetics in understanding the mechanism of a chemical reaction.

### UNIT-III

Photo chemistry: Grothus drapers law, Einstein's law if photo chemical equivalence, quantum efficiency, abnormal quantum yields, photochemistry H2Br2 and H2CL2 reactions Fluorescence, phosphorescence, Photo synthesis and its mechanism.

## INORGANIC CHEMISTRY

### UNIT-IV

Chemistry of d-Block elements: General properties, Electronic configurations, size of atoms and Ions, oxidation states, complex formations, catalytic Activity, Magnetic properties, comparison of Physical and chemical properties of second and Third Transition series with 3d series.

## ASSIGNMENTS

Chemistry of F-Block elements: Chemistry of lanthanides, electronic configurations, oxidation states, lanthanide contraction, spectral properties, magnetic properties of lanthanide Ions (Ln3+), separation of lanthanides, Ion-exchange method, Solvent Extraction. Chemistry of Actinides, Electronic Configuration and Ionic Radii, Actinide contraction, oxidation states, spectral and Magnetic properties.

**(P.T.O)**

## PRACTICALS

1. Reactions of common organic compounds, characteristic reaction of the following classes of compounds hydrocarbons, Alcohols, aldehydes, ketones, carboxylic acids, esters, amides amines, nitro compounds and carbohydrates.

2. Identification of functional groups in the following types of compounds and study of
   (a) Physical constants.
   (b) Detection of extra elements.
   (c) Solubility data.
   (d) Characteristic reactions.
   (e) Preparation of rational derivatives.
   Carboxylic acids, Phenols, Aldeydes, Ketones, Carbohydrates, Amides, Amides caters and altro compounds.

# MODEL QUESTION PAPER

## III – SEMESTER, M.Sc. GEOLOGY (5 YEAR INTEGRATED COURSE)

### PAPER – III, CHEMISTRY

**(With effect from the admitted batch of 2014-2015)**

**Time: 3 Hrs** **Max. Marks: 80**

**Answer all five questions**

**UNIT-I**

1. Explain Aromaticity of Benzenoid and Non-Benzenoid compounds with examples.

**OR**

Write the preparations and chemical properties of naphthalene?

**UNIT-II**

2. Derive the rate equation and half life time for first order reactions.

**OR**

(A) Explain the effect of temperature on rates.
(B) Explain any one method of determination of the order of reaction.
(C) Define the following terms rate, order and molecularity.

**UNIT-III**

3. Explain the abnormal behaviours of the quantum yield.

**OR**

(A) Explain Einstein's law of photo chemical equivalence.
(B) Detail explanation of Fluorescence and Phosphorescence.

**UNIT-IV**

4. Explain the following properties of d-block elements.
(A) Oxidation states.
(B) Colour properties.
(C) Catalytic activity.

**OR**

Comparison of Physical and chemical properties of second and Third Transition Series with 3d Series