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Seat No.	

B.Sc. (Part - III) (Semester - V) (CBCS) Examination, January - 2023
ENGLISH (Compulsory) (Paper - III)
English for Communication
Sub. Code : 79671

Day and Date : Saturday, 07 - 01 - 2023 **Total Marks : 40**
Time : 2.30 p.m. to 4.30 p.m.

Instructions : **1) All questions are compulsory.**
2) Figures to the right indicate full marks.

Q1) A) Choose the appropriate answer and complete the following sentences. **[3]**

a) The devotees, in our country, should go to the pilgrims with their eyes lowered and body couched in _____.

i) happiness ii) fear

iii) anxiety iv) terror

b) For more than thirty years Morris has made a study of _____.

i) detective fiction ii) his shortcomings

iii) safety measures iv) jewellery shops

c) According to Sudha Murty, _____ is inversely proportional to economic standing.

i) writing ii) travelling

iii) conversation iv) reading

B) Answer the following questions in one word/phrase/sentence each. **[3]**

a) Who are William Morris's favorite writers?

b) Whom did the pilgrims or travellers lose?

c) Which award did Sudha Murty receive from Bhopal?

P.T.O.

Q2) A) Answer the following questions in three to four lines each. (2 out of 3) **[4]**

a) What was the cause of George's worry in the story?

b) Who were the incredible women in Indian history referred by Sudha Murty?

c) How was the first stage of pilgrimage?

B) Write a short note on the following in about 7-8 sentences. (any one)**[4]**

a) The American

b) "Enterprise" as a social satire

C) Do as directed. **[2]**

a) Write the noun form of the word "beautiful"

b) Give antonyms of "honest"

Q3) A) a) Suppose you have been called for an interview for the post of Chemist. Write a piece of conversation between you and the interviewer. **[8]**

OR

b) Read the following advertisement carefully and answer the questions given below the advertisement. **[8]**

A Fast Growing Pharma Allopathic Company

AREA SALES MANAGER - 02 Posts

HQ - Pune (Independent working)

Candidates must have 3-5 years' experience in

Pharmaceutical industry as an M.R. or Area Manager.

Walk in for interview on SUNDAY

Date 22nd Sept., 2019 between 09.00 to 02.00 p.m. at

Hotel Natraj, Pune-Bangalore Road, Pune.

Director, Lifeline Health Care Pvt. Ltd.,

Pune, Cell No. 8050399456

i) What certificates will you take with if you are called for an interview for the post of area sales manager?

ii) Suppose you do not have any working experience, how will you answer the question about it?

iii) How will you explain you strong points to the interviewers?

iv) How will you introduce yourself?

B) a) Suppose you participated in a N.S.S. residential camp for seven days. Write a Personal Blog describing your experiences there. **[8]**

OR

b) Write an email to Municipal Corporation complaining about the bad condition of the roads in your area.

Q4) A) Write a report about your participation in a Cultural Event. **[8]**

OR

B) Write a well-organized paragraph on 'My First Experience of Travelling by Train'.

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B.Sc. (Part - III) (Semester - V) Examination, January - 2023

CHEMISTRY

Inorganic Chemistry (Paper-IX)

Sub. Code: 79682

Day and Date : Tuesday, 03 - 01 - 2023 **Total Marks : 40**

Time : 2.30 p.m. to 4.30 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Neat diagrams should be drawn wherever necessary.**

Q1) A) Answer the following in one sentence. **[4]**

a) Define Lewis acid.

b) What are semiconductors?

c) Define organometallic compounds?

d) What is homogeneous catalysis?

B) Select most correct alternative and rewrite the sentence. **[4]**

a) Arrhenius concept is called as_____

i) Water Ion system

ii) Proton donor acceptor system

iii) Electron donor acceptor system.

iv) Oxide Ion theory

b) In octahedral complexes eg electrons are destabilized by_____

i) –4Dq ii) –6Dq

iii) +6Dq iv) +4Dq

P.T.O.

c) Asymmetric filling of eg orbitals, with_____electronic configuration Jahn-Teller distortion takes place.

i) d^4 (low spin), d^7 (low spin), and d^9 (both low and high spin)

ii) d^4 (high spin), d^7 (high spin), and d^9 (both low and high spin)

iii) d^4 (high spin), d^7 (low spin), and d^9 (both low and high spin)

iv) d^4 (high spin), d^7 (low spin), and d^8 (both low and high spin)

d) Superconductors shows_____

i) Resonance effect ii) Trans effect

iii) Raman effect iv) Meissner effect

Q2) Attempt any TWO of the following. **[20]**

a) Explain in brief the classification or types of solvent in detail.

b) Describe crystal field splitting of d orbitals in octahedral complexes.

c) Explain the semiconducting action in silicon caused due to the addition of penta-valent and tri-valent atoms.

Q3) Attempt any THREE of the following. **[12]**

a) Mention the factors affecting the magnitude of crystal field splitting parameters and explain any one in detail.

b) Nature of Bonding in metal carbonyls

c) Geometry of $Cr(CO)_{6.}$

d) Mechanisms of catalysis on the basis of Adsorption theory

e) Explain homogeneous catalytic reactions?

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Seat No.	

B.Sc. (Part - III) (Semester - V) (CBCS) Examination, January - 2022
CHEMISTRY
Organic Chemistry (Paper - X)
Sub. Code : 79683

Day and Date Wednesday, 4 - 01 - 2023 **Total Marks : 40**
Time : 2.30 p.m. to 4.30 p.m.

Instructions : **1)** **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Spectroscopic chart is allowed.**

Q1) A) Answer in one sentence **[4]**

i) How many sets of equivalent protons present in the following compounds?

a) $CH_3.CH_2.CHO$ b) $H_3C-\overset{O}{\overset{\|}{C}}-CH_3$

ii) In which type of vibration, change in bond angle take place?

iii) Which material are used to prepare rod of globar source?

iv) Which of hydrogens a-d in the following molecule gives a triplet signal in a normal ^1H NMR spectrum?

$$\underset{a}{CH_3}-\overset{O}{\overset{\|}{\underset{b}{C}}}-\underset{c}{CH_2}\underset{d}{CH}(OCH_3)_2$$

B) Select most correct alternative among those given below and rewrite the sentences. **[4]**

i) According to Woodward fieser rule, the increment for double bond extending conjugation is _____

a) 5 b) 15

c) 12 d) 30

P.T.O.

ii) The most deshielded proton is found in the _____ compound.

a) CH_3OH b) CH_3COOH

c) TMS d) C_6H_6

iii) In IR Spectroscopy, Nujol mean _____

a) Polymer b) Mineral oil

c) Crude oil d) Volatile oil

iv) Hooks law is used in determination of _____

a) Stretching frequency b) Bending frequency

c) Functional group d) Molecular weight

Q2) Attempt any two of the following. **[20]**

i). a) Explain the phenomenon of spin-spin coupling, with examples.

b) What is coupling constant? Write the types of coupling and their applications.

ii) Explain the different types of electronic transitions. Illustrate with suitable examples.

iii) a) What are the different types of ions produced in mass spectrometry with suitable examples?

b) Explain McLafferty rearrangement with suitable examples.

Q3) Attempt any three of followings. **[12]**

i) Explain the terms:

a) Absorption, b) Emission

c) Fluorescence d) Scattering

ii) Different types of fundamental modes of vibrations in IR Spectroscopy.

iii) What is functional group region? State its significance

iv) Chromophore and Auxochrome

v) Factors affecting Frequencies in IR Spectroscopy.

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B.Sc. (Part - III) (Semester - V) (CBCS) Examination, January - 2023

CHEMISTRY

Physical Chemistry (Paper-XI)

Sub. Code: 79684

Day and DateThusday, 05 - 01 - 2023 **Total Marks : 40**

Time : 2.30 p.m. to 4.30 p.m.

Instructions : **1)** **All questions are compulsory.**
2) **Figures to the right indicates full marks.**

Q1) A) Answer the following in one sentence only. **[4]**

a) Which solution is used in salt bridge?

b) What is fluorescence?

c) What is Raman effect?

d) Write de broglie equation.

B) Choose the most correct alternative for each of the following and rewrite the sentence. **[4]**

a) The uncertainty principle was proposed by _____.

i) de Broglie ii) Schrodinger

iii) Einstein iv) Heisenberg

b) The quantity (2S+1) is known as _____.

i) Spin pairing ii) Spin multiplicity

iii) excited state iv) ground state

c) The process of successive vaporiazation and conddensation is called as_____.

i) distillation ii) fractional distillation

iii) vaporization iv) none of these

d) When temperature coefficient of cell becomes zero, ΔG of the cell reaction is _____.

i) zero ii) euqal to ΔS

iii) equal to ΔH iv) equal to ΔA

P.T.O.

Q2) Attempt any two of the following. **[20]**

a) Discuss vibrational spectra of diatomic molecules.

b) Derive the equation for potential of a chemical cell without transference.

c) State and explain laws of photochemistry.

Q3) Attempt any three of the following. **[12]**

a) What is wave particale duality? Explain de Broglie's hypothesis.

b) Mention various types of partially miscible liquids and explain any one of them.

c) Define quantum yield and give reasons for high and low quantum yield.

d) Derive Nernst equation for the single electrode potential.

e) Discuss distillation of solutions with the system having boiling point maximum.

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B.Sc. (Part - III) (Semester - V) Examination, January - 2023
CHEMISTRY (Paper - XII)
DSE-E8 : Analytical Chemistry
Sub. Code : 79685

Day and Date : Friday, 06 - 01 - 2023 **Total Marks : 40**

Time : 2.30 p.m. to 4.30 p.m.

Instructions :
1) **All questiosn are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Draw neat diagrams and give equations wherever necessary.**
4) **Use of scientific calculator and logarithmic table is allowed.**

Q1) A) Answer the following in one sentence : **[4]**

a) What are the advantages of digesion?

b) Which is the device used for measuring response of photocell?

c) What is the nature of the curve at end point, in potentiometric titration?

d) Which is the stationary phase used in adsorption chromatography?

B) Choose the most correct alternative and rewrite the sentences. **[4]**

a) In Flame emission photometers, the measurement of _____ is used for quantitative analysis.

i) Colour ii) Intensity

iii) Velocity iv) Frequency

b) Beer's law is valid when _____

i) White light is used

ii) Temperature is kept constant

iii) Large amount of electrolyte is present

iv) Coloured solute forms complexes

P.T.O.

c) _____ electrode is not used as indicator electrode in determination of pH of the solution.

i) Glass electrode ii) Quinhydrone electrode

iii) Zinc electrode iv) Hydrogen electrode

d) In column chromatography the alumina used act as _____

i) Organic phase ii) Adsorbent

iii) Aqueous phase iv) Porous material

Q2) Solve any two of the following : **[16]**

a) Define precipitation and explain the essential requirements of good precipitation.

b) Describe construction and working of quinhydrone electrode. Discuss its use in determination of pH of solution.

c) What are the types of ion exchangers? Give the applications of ion exchange chromatography.

Q3) Solve any four of the following. **[16]**

a) Write short notes on, Co-precipitation.

b) Explain the terms transmission and optical density used in colorimetry. How are they related?

c) Write a short note on, Photovoltaic cell.

d) Write short notes on, Classification of chromatography.

e) Give a brief account of mirrors and slits in flame photometry.

f) Give a block diagram of simple flame photometer.