

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Computer Science and Statistics
Paper Code: BCH-CC-01
Section: STATISTICS

Time: 90 min

Max Marks: 37

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q.1 State whether TRUE or FALSE for the following (7x1)

- a. Regression analysis is to study the degree of relationship between the variables
- b. If two quantities vary in such a way that movements in one are not accompanied by movements in the other, these quantities are correlated.
- c. The Hypothesis is TRUE but our test reject it is called type II error
- d. If the random variable X is discrete one, the probability function $P(X)$ is called the probability density function
- e. Both the regression coefficients have different signs.
- f. Quantitative classification refers to the classification of data according to some attribute or quality.
- g. The objective of F test is to discover whether the two independent estimates of population variance differ significantly.

Q.2 a) From the following data compute Arithmetic mean and Median (2X4)

Marks	: 0-10	10-20	20-30	30-40	40-50	50-60
No. of Stud.:	5	10	25	30	20	10

b) Calculate standard deviation from the data given below

X :	10	15	25	35	50	20	5
F :	3	7	22	60	85	32	8

Q.3 a) What do you mean by the term 'probability', State the Addition Theorem and Multiplication theorems of the probability. (2X3.5)

b) Making use of the data summarised below calculate the coefficient of correlation.

X :	10	6	9	10	12	13	11	9
Y :	9	4	6	9	11	13	8	4

Q.4 (a) Explain ANY TWO of the following in brief (2X4=8)

- i) Binomial Distribution
- ii) Normal Distribution
- iii) Poisson Distribution

- b) A certain stimulus is administered to each of 12 patients resulted in the following change in blood pressure. (1X7)

5, 2, 8, -1, 3, 0, -2, 1, 5, 0, 4, 6

Can it be concluded that stimulus will in general be accompanied by an increase in blood pressure. (Given $t_{0.05}(11) = 2.201$)

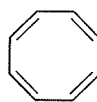
B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Chemistry
Paper Code: BCH-CC2-TH

Time: Three Hours

Max Marks: 75

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q1. Answer all the questions given below (a-j) (1.5x10= 15)

- a. Number of bond pair and lone pair electrons present on N atom in NO_3^- are
(A) 3, 1 (B) 4, 0 (C) 2, 2 (D) 1, 3
- b. In BrF_3 molecule the lone pairs occupy an equatorial position to minimise
(A) lone pair-bond pair repulsion only
(B) bond pair-bond pair repulsion only
(C) lone pair-lone pair repulsion and lone pair-bond pair repulsion
(D) lone pair-lone pair repulsion only
- c. If the water molecule is linear
(A) it would have a very high boiling point (B) it would be highly reactive
(C) its dipole moment would be zero (D) it would be highly ionic
- d. What is the hybridisation of each carbon in $\text{H}_2\text{C}=\text{C}=\text{CH}_2$?
(A) SP , SP^2 , SP^3 (B) SP , SP^2 , SP^3 (C) SP^2 , SP^2 , SP^2 (D) SP^2 , SP , SP^2
- e. Which of the following is aromatic?
(A)  (B)  (C)  (D) 
- f. Arrange the hydrocarbons of the following hybridizations in the increasing order of their acidity.
 SP^2 SP SP^3
- g. What is a meso compound?
- h. The shape of PCl_5 molecule is _____
- i. State the hybridization and geometry of carbanion.
- j. Draw the Lewis dot structures of Carbon monoxide and acetylene.

Q2. Attempt ANY TWO of the following:

(7.5x2=15)

- A. Explain briefly of the following: (i) Lattice Energy (ii) Solvation energy (iii) Fajan's rule (iv) Bond polarity, and (v) Born Haber Cycle?

- B. Discuss the effect of chemical forces on physical properties like melting and boiling points?
- C. Using Molecular Orbital diagram discuss the magnetic properties and bond strength for the following molecules (i) NF, (ii) OF, (iii) CH₄, (iv) BH₃, and (v) XeF₆?
- D. Describe the types of bonds and orbitals in acetone, (CH₃)₂CO?

Q3. Attempt ANY TWO of the following:

(7.5x2=15)

- A. What are the limitations of First law of thermodynamics?
- B. Differentiate between reversible and cyclic process.
- C. Define thermodynamic. What is system and surrounding?
- D. Why entropy of perfectly crystalline substance is taken as zero at absolute zero?

Q4. Write a detailed note on ANY TWO of the following:

(7.5x2=15)

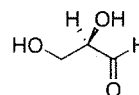
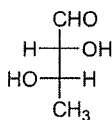
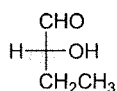
- A. Factors influencing the stability of carbocations.
- B. Hydrogen bonding.
- C. Describe different types of hybridizations with suitable examples.
- D. What are intermolecular forces? Explain about the following intermolecular forces.
 - (i) Dipole-Dipole interaction forces
 - (ii) London forces

Q5. Answer ANY TWO of the following:

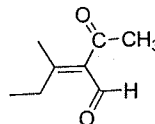
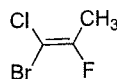
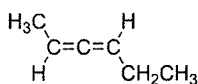
(7.5x2=15)

- A. Explain the various methods of resolution of a racemic mixture.
- B. (a) Define the terms optical activity, optical rotation, dextrorotation, levorotation and specific rotation.
 (b) 0.3gm of an optically active compound is dissolved in 15mL of chloroform and the resulting solution was taken in 10cm polarimeter tube. The optical rotation of the solution was measured as +0.96°. Calculate the specific rotation of the compound.
- C. Draw the conformational energy diagram for ethane and highlight the relative stabilities of the conformers.
- D. Assign configurations of the following compounds.

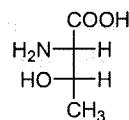
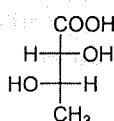
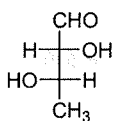
R/S Configuration:



E/Z Configuration:



D/L Configuration:



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B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Physics and Biology
Paper Code: BCH-GE1-01-A-TH
Section: Biology

Time: 90min

Max Marks: 37

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Question 1 State whether the statement true or False

14 X 0.5=7

1. Genotype is based on phenotype.
2. Six gametes will be produced for the RrYy allele arrangement.
3. Chromosome is the physical basis of inheritance while DNA is the chemical basis of inheritance.
4. Polyploidy facilitates gene exchange between distantly related species.
5. Translocations involve non-homologous chromosomes, whereas crossing over involves non-sister chromatids of homologous chromosomes.
6. Low CO₂ Concentration promotes stomatal opening
7. Plants transpire more rapidly in the dark than in the Light
8. The phenomenon of synthesis of ATP in light reactions of photosynthesis is called photophosphorylation
9. Every living cell has a cell wall.
10. Macromolecules are large molecules composed of thousands of non-covalently connected atoms.
11. A centriole comprises nine bundles of microfilaments that are hollow tubes arranged in a ring.
12. Blood clotting by platelets, WBCs and other type of proteins like antibodies protect our body from any kind of foreign invasion.
13. Net filtration pressure is more than glomerular blood hydrostatic pressure to drive glomerular filtration.
14. Enterohepatic circulation is a recycling process dietary fats.

Question 2

Attempt ANY THREE

3 X 5=15

- A. What is the basis of classification of plants? Name the major taxa and their distinguishing features.
- B. Draw neat and well labeled electron microscopic structure of a typical plant cell.
- C. Explain Watson and Crick model of DNA double helix.
- D. What is the significance of mitosis and meiosis?
- E. Explain briefly the different chemical constituents of living cells.

Question 3

Attempt ANY THREE

3 X 5=15

- A. Justify: Coat color in mice is under the control of Supplementary genes
- B. Differentiate between Incomplete dominance and Co dominance. Give suitable example.
- C. Give an account of Blood Clotting Cascade. What is platelets plug formation?
- D. Discuss the events in spermatogenesis. Draw a well labeled diagram of sperm?
- E. Differentiate between light and dark reactions?

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Physics and Biology (Tutorial)
Paper Code: BCH-GE1-01-A-TU
Section: Biology-TU

Time: 45min

Max Marks: 18

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q1. State whether the statement is True or False

13 X 1= 13.0

- i. Calvin cycle uses ATP and NADPH from light reactions to produce sugars
- ii. Light reaction is also called Hill Man reaction
- iii. Photorespiration involves PEP carboxylase enzyme for capturing carbon dioxide.
- iv. Flowers that have only one male or one female reproductive organs are called perfect flower
- v. Biotic pollination is pollination by animal.
- vi. Cleistogamous flowers are those flowers in which pollination occurs before flowers open.
- vii. A disaccharide is formed when a dehydration reaction joins two monosaccharides
- viii. Saturated fatty acids have the minimum number of hydrogen atoms possible and no double bonds
- ix. Mitochondria converts chemical energy from food into energy that can be used by the cell.
- x. Crossing over occurs during prophase of mitosis.
- xi. The sympathetic nervous system activates the fight or flight response during a threat or perceived danger.
- xii. Progesterone and estrogens are produced by ovaries.
- xiii. The lymphatic system contains immune cells called lymphocytes and lymph nodes are sites of both microbial destruction and the production of antibodies against other foreign invaders.

Q 2 Fill in the blanks

10X0.5= 5.0

- i. DNA strand connecting two nucleosomes is called -----.
- ii. Polytene chromosomes are also called -----.
- iii. In humans ----- are known to produce a number of malfunctions, e.g. *cri-du-chat*.
- iv. ----- is known as the Father of Genetics.
- v. In ----- inheritance there is no cumulative action in the presence of two dominant genes.
- vi. The inheritance of fruit shape in *Cucurbita pepo* is under the effect of -----.
- vii. ----- is between Homozygous recessive x Hybrid.
- viii. The first-generation offspring in a breeding experiment is known as -----.
- ix. More than two alternate forms of a gene that occur at the same gene locus and express the different phenotypes of the same trait are called -----.
- x. A phenotypically normal man who has a brother with M.D. marries a homozygous normal woman. There will be ----- probability that any of their children will have M.D.

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Physics and Biology or Mathematics
Paper Code: BCH-GE-01-TH A and B
Section: PHYSICS

Time: 90 min

Max Marks: 38

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q. 1: MCQ (Attempt ALL)

(2 x 4)

I. A periodic motion:

- (a) is oscillatory (b) is not oscillatory
(c) may or may not be oscillatory (d) none of these

II. A photon of 2.1 eV energy is placed in which part of the EM spectrum?

- (a) visible (b) infrared
(c) radio waves (d) UV

III. In Young's Double Slit Experiment, the shape of slits is:

- (a) circular (b) square
(c) triangular (d) rectangular

IV. Two spontaneously emitted photons are:

- (a) in the same direction (b) in the opposite directions
(c) usually not in the same direction (d) in orthogonal directions

Q. 2: Attempt ANY TWO questions

(6 x 2)

A. Discuss EM spectrum and write three differences between UV and infrared radiation.

B. In Young's Double Slit Experiment, demonstrate that the dark fringes cannot be completely dark if amplitudes of light from the slit 1 and slit 2 are not equal.

C. Write six differences between a laser and a common light.

Q. 3: Attempt ANY TWO questions

(9 x 2)

A. Consider a harmonic motion, in which the force (F) and the displacement (y) are related by equation $F_{HM} = -[y + (\frac{1}{2})ky^3]$. It can be approximated $F_{SHM} = -y$; for small values of y. Find out the value of k if $F_{SHM}/F_{HM} = 0.9$, for $y = 0.1$ m.

B. How are Newton's Rings formed? Find the wavelength of light if the diameters of 8th and 12th dark fringes are 4.16 mm and 5.09 mm, respectively. The radius of curvature is 1000 mm.

C. Discuss the difference between spontaneous and stimulated emission. With appropriate diagrams, discuss the working mechanism of a He-Ne laser in detail.

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Physics and Biology or Mathematics Tutorial
Paper Code: BCH-GE-01-TU A and B
Section: PHYSICS

Time: 45 min

Max Marks: 19

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q. I. A LASER light: (Marks: 4)

- | | |
|---------------------------|---------------------------|
| (a) is monochromatic | (b) is coherent |
| (c) is highly directional | (d) all three are correct |

Q. II. The value of potential energy in SHM: (Marks: 4)

- | | |
|-------------------------|--|
| (a) is invariant | (b) keeps on decreasing |
| (c) keeps on increasing | (d) oscillates between a maxima and a minima |

Q. III. A photon of 23 eV energy is placed in which part of the EM spectrum? (Marks: 4)

- | | |
|-------------|--------------|
| (a) x-ray | (b) infrared |
| (c) visible | (d) UV |

(Marks: 4)

Q. IV. The central fringe in Newton's Rings interference pattern is:

- | | |
|--------------------------|-------------------------|
| (a) dark and circular | (b) bright and circular |
| (c) bright and parabolic | (d) dark and parabolic |

(Marks: 3)

Q. V. Which Maxwell Equation is also known as Gauss Law?

- | | |
|-----------|------------|
| (a) first | (b) second |
| (c) third | (d) fourth |

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Mathematics
Paper Code: BCH-GE-01-B (Th)

Time: 90 min

Max Marks: 37

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q1. Attempt All of the following:

(7 x 1 = 7)

- i) A square matrix A is called diagonal if
- ii) If $A = \begin{bmatrix} a^{2021} & b^b \\ c & e^{2019} \end{bmatrix}$, then $(A^T)^T = \dots\dots\dots$, where A^T is the transpose of A .
- iii) The 2nd derivative of the function $y = x^{2021}$ is
- iv) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} dx$.
- v) If $f(2a - x) = f(x)$, then $\int_0^{2a} f(x) dx = \dots\dots\dots$
- vi) If $y = e^{\sin^{-1} x}$, then $\frac{dy}{dx} \dots\dots\dots$
- vii) A function $F(x, y)$ is said to be homogeneous function of degree n if $F(tx, ty) = \dots\dots\dots$ for any nonzero constant t .

Q2. Attempt ANY THREE of the following:

(3 x 4 = 12)

- i) If $A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 3 \\ 0 & 0 & 2 \end{bmatrix}$, prove that $A^3 - 6A^2 + 7A + 2I = 0$.
- ii) If x, y, z are different and if the determinant of the matrix $A = 0$, where $A = \begin{bmatrix} x & x^2 & 1 + x^2 \\ y & y^2 & 1 + y^2 \\ z & z^2 & 1 + z^2 \end{bmatrix}$, then prove that $1 + xyz = 0$.
- iii) Evaluate $\int \frac{x^2 + x + 1}{(x+2)(x^2+1)} dx$.
- iv) Verify that the function $y = A \cos x + B \sin x$, where $a, b \in R$ is a solution of the differential equation $\frac{d^2 y}{dx^2} + y = 0$.
- v) Find the general solution of the differential equation $\frac{dy}{dx} = \frac{x+1}{2-y}$, provided that $y \neq 2$.

Q3. Attempt ANY THREE of the following:

(3 x 6 = 18)

- i) Show the differential equation $(x - y)dy - (x + 2y)dx = 0$ is homogeneous and solve it.

ii) Evaluate $\int_{-1}^2 |x^3 - x| dx$.

iii) Find the inverse of the matrix $A = \begin{bmatrix} 2 & -3 & 3 \\ 2 & 2 & 3 \\ 3 & -2 & 2 \end{bmatrix}$.

iv) Find the values of a and b such that the function defined by

$$f(x) = \begin{cases} 5, & x \leq 2 \\ ax + b, & 2 < x \leq 10 \\ 21, & x \geq 10 \end{cases}$$

is continuous function.

v) If $x = \sqrt{a^{\sin^{-1} t}}$, $y = \sqrt{a^{\sin^{-1} t}}$, then find $\frac{dy}{dx}$.

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Mathematics Tutorial
Paper Code: BCH-GE-01-B (TU)

Time: 45 min

Max Marks: 18

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

(6X3 =18)

Question-1 If the order of matrix A is $a^{2019} \times b^{2020}$ and the order of B is $b^{2020} \times c^{2021}$. Then the order of matrix AB is?

- (A) $a^{2019} \times b^{2020}$ (B) $b^{2020} \times c^{2021}$ (C) $a^{2020} \times c^{2021}$ (D) $b^{2020} \times a^{2021}$

Question-2 Find $\frac{dy}{dx}$, if $x = a \cos \theta$, $y = a \sin \theta$

- (A) $\cot \theta$ (B) $-\cot \theta$ (C) $\tan \theta$ (D) $-\tan \theta$

Question-3 If the matrix A is both symmetric and skew symmetric, then

- (A) A is a diagonal matrix (B) A is a zero matrix (C) A is a square matrix (D) None of these

Question-4 The determinant of the matrix $A = \begin{bmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{bmatrix}$ is

- (A) abc (B) $2abc$ (C) $3abc$ (D) $4abc$

Question-5 For what values of 'x': $\begin{bmatrix} 1 & 2 & 1 \end{bmatrix} \begin{bmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{bmatrix} \begin{bmatrix} 0 \\ 2 \\ x \end{bmatrix} = 0$?

- (A) -1 (B) -3 (C) 1 (D) 3

Question-6 For what value of a such that the function defined by

$$f(x) = \begin{cases} 5, & x \leq 2 \\ x + a, & 2 < x \leq 10 \end{cases}$$

is continuous function.

- (A) 3 (B) 5 (C) 4 (D) 2

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Computer Science and Statistics (Tutorial)
Paper Code: BCH-CC-01-TU
Section: STATISTICS-TU

Time: 45 min

Max Marks: 18

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

(6 X 3=18)

Q.1. State whether **TRUE** or **FALSE** for the following

- A. The curve obtained by plotting cumulative frequencies is called an Ogive.
- B. If two events A and B are dependent, the probability that they will both occur is equal to the product of their individual probabilities
- C. If χ^2 is zero it means that the observed and expected frequencies completely coincide.
- D. A sample enquiry is that in which all the items consisting the population are studied and conclusions are drawn there from.
- E. In a Histogram, the class intervals are plotted along the vertical axis.
- F. A measure of variation is one that measures the extent to which there are differences between individual observation and some central value.

B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: Basics of Computer Science and Statistics (Tutorial)
Paper Code: BCH-CC-01-TU
Section: Computer Science-TU

Time: 45 min

Max Marks: 19

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q1. Attempt ALL:

- i) Which of the following tag is used to link the URL (2 Marks)
a) <hyperlink> b) <link> c) <style> d) <a>
- ii) TCP/IP model does not have _____ layer but OSI model have this layer. (2 Marks)
a) Session layer b) transport layer c) application layer d) network layer
- iii) MIME stands for (2 Marks)
a) Multipurpose Internet Mail Email
b) Multipurpose Internet Mail Extension
c) Multipurpose International Mail Entity
d) Multipurpose International Mail End
- iv) A web cookie is a small piece of data that is (2 Marks)
a) Sent from a website and stored in user's web browser while a user is browsing a website
b) sent from user and stored in the server while a user is browsing a website
c) sent from root server to all servers
d) sent from the root server to other root servers
- v) An attribute is a _____ in a relation. (2 Marks)
a) Tuple b) Row c) Column d) Value
- vi) How many versions of IP are available? (2 Marks)
a) 4 version b) 1 version c) 2 version d) 6 version
- vii) Which of the following is not an application software? (2 Marks)
a) Wordpad b) Photoshop c) Windows 10 d) MS-excel

viii) Which of the following is used to read a HTML page and render it? **(2 Marks)**

- a) Web Server b) Web Matrix c) Web Browser d) Web Page

ix) The 'heart' of the processor which performs many different operations. **(2 Marks)**

- a) Motherboard b) Control Unit c) Arithmetic and logic unit d) Memory

x) If all devices are connected to a central hub, then topology is called _____ **(1 Mark)**

**B.Sc.-M.Sc. Integrated Program
Semester-I Examination, 2021
Paper Title: English Communication
Paper Code: BCH-AEC-01**

Time: 90 min

Max Marks: 37

Attempt all questions. Use only A4 sheets. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

SECTION-A (1 X 7=7)

Q.1. Complete the following sentences:

- i. The telephone, letter and email are example of the....
- ii. The nouns which cannot be heard or seen are known as....
- iii. The message is misinterpreted because of the....
- iv. The important component of hearing is....
- v. In the business letter what comes first in their structure....
- vi. The Language for report writing is usually.....
- vii. Environment barriers are usually known as....

SECTION-B (3 X 5=15)

Q.2. Give appropriate answers for ANY THREE of the following

- A. Discuss the Importance of communication in today's world.
- B. Explain the advantages of oral communication over written communication.
- C. Explain the importance of body language in communication.
- D. Explain the profile of a good speaker.
- E. Discuss the Do's and Don'ts of an interview.

SECTION-C (3 X 5=15)

Q.3. Give appropriate answers for ANY THREE of the following

- A. Explain emotional intelligence as one of the 7 soft skills you need to achieve career growth.
- B. What do mean by KOPPACT factors.
- C. Write a speech on the topic: "Leadership is not about being nice. It's about being right and being strong." (Word limit 150-200)
- D. Write a memo informing employees about company policy or process changes. Invent the necessary details.
- E. Write an email to your last employee to request for recommendation letter. Invent the details.

B.Sc.-M.Sc. INTEGRATED PROGRAMME - BOTANY
SEMESTER I EXAMINATION MARCH 2021
PAPER TITLE: ENVIRONMENTAL STUDIES
PAPER CODE: BCH-AEC-2

Time: 90 min

Maximum Marks: 37

Attempt ALL questions. All parts of a question must be attempted in continuation. Start answering each question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Q1. (A) Write short notes (ANY FOUR) (4)

- a) Biosphere
- b) Photovoltaic energy
- c) Biomass energy
- d) Ecosystem
- e) Thermal pollution

(B) Match the following: (3)

Column A	Column B
a) Hazardous waste	i) Tansley
b) Ecosystem	ii) Lead
c) Dobson units	iii) Ivory
d) Wildlife sanctuary	iv) Bharatpur
e) Poaching	v) Shola
f) Grassland	vi) Ozone

Q2. Write short notes on ANY THREE of the following: (3x5=15)

- a) Causes, effects and control measures of air pollution.
- b) Role of an individual in preventing pollution.
- c) What is an aquatic ecosystem? Mention the types of aquatic ecosystem and its uses.
- d) The carbon cycle
- e) Functions of ecosystem

Q3. Answer ANY THREE of the following questions: (3x5=15)

- a) Differentiate between in situ and ex situ conservation.
- b) Define producers, consumers and decomposers with example.
- c) Define biodiversity. What are the threats to biodiversity?
- d) Differentiate between renewable and non-renewable resources. Explain the role of an individual in conservation of natural resources.
- e) What are the benefits and problems associated with dams?

.....X.....

Roll No. _____

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SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.SC-HONS. WITH RESEARCH. CHEMISTRY
SEMESTER I

End term Examination 2023

Paper Name: Chemistry of Cosmetics & Perfumes

Paper Code: BCH-MIC-101

Time: 2.5 hrs

Max. Marks: 60

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; **Section B:** Answer any 2 out of 4; **Section C:** Answer all the questions, each question has an internal choice

Abbreviations Used CO- Course Outcome, CLO- Course Learning Outcome, PO- Program Outcome, PLO- Program learning Outcome, BTL- Bloom Taxonomy Level: BT level 1- Remember; BT level 2- Understand; BT level 3- Apply; BT level 4- Analyze; BT level 5- Evaluate, BT level 6- Create

Q.No		BTL	CLO	PLO
<u>SECTION A</u>				
Attempt <u>all</u> questions		(10*1.5= 15 Marks)		
A 1.	What are the ideal characteristics of a good hair remover cream?	2	3	2
A 2.	“Stearic acid is the hero ingredient of vanishing creams,” Justify this statement	4	2	3
A 3.	What are face powders? How are they classified?	3	2	2
A 4.	“Humectants play an important role in various cosmetic preparations” Explain with examples.	6	6	3
A 5.	Why do we need Suntan preparations?	5	2	2
A 6.	Briefly discuss the preparation method of Shaving creams.	2	3	3
A 7.	How are Antiperspirants different from Deodorants?	4	1	2
A 8.	What are the uses of Muscone in cosmetic preparations?	3	4	2
A 9.	Write the source, structure and use of 2-Phenyl ethyl alcohol.	1	2	4
A 10.	Differentiate between Cold creams and Vanishing creams.	3	2	3

SECTION B

Attempt <u>any two</u> out of four		(2*10=20 Marks)		
B 1.	Discuss the chemistry involved in Hair Dyes and explain their mode of action.	2,4	4	4
B 2.	What are Nail Enamels? How are they synthesized? Mention the roles of the basic ingredients used in Nail enamels.	3	2	3
B 3.	What are the ingredients used in the formulation of a hair shampoo and their roles in the shampoo formulation. Give a detailed account of different types of surfactants used in shampoos along with suitable examples.	5	3	3
B 4.	Identify the cosmetic product from the ingredients given below: Borax, Beeswax, Glycerin, Olive oil, perfume Briefly discuss the role of each of these in the formulation of the given cosmetic product. Also discuss the mode of action of this cosmetic product.	1,4	2	2

SECTION C

(5*5=25 Marks)

Attempt <i>all</i> questions, each question has an <i>Internal choice</i>			
C 1.	Discuss the formulation of a Talcum Powder. Explain the significance of zinc stearate in this formulation.	4	1 5
OR			
	What are Artificial Flavours? Comment on their uses and applications in our day-to-day life.	2	2 2
C 2.	What are the core ingredients in a Lipstick preparation? Discuss the formulation of lipsticks.	5	2 6
OR			
	What are cosmetics? How are they different from drugs? How do you classify cosmetics based on their physical forms?	4	6 3
C 3.	Explain the role of covering materials, slip materials and absorbent materials in face powder preparation with suitable examples.	5	2 3
OR			
	What are Essential oils? Give any one method of their extraction from natural sources.	3	1 2
C 4.	"Holding agents and propellants are the key ingredients in Hair sprays". Comment.	6	2 3
OR			
	Comment on the toxic effects of various cosmetic preparations and perfumery agents. What steps can be taken to minimize these toxic effects?	5	5 3
C 5.	Discuss the properties of an ideal Suntan lotion. What are the most Commonly used raw materials in suntan lotions?	1	2 2
OR			
	Mention three uses each of Sandalwood oil and Eucalyptus oil.	2	4 2

Roll No.....

JAMIA HAMDARD
DEPARTMENT OF CHEMISTRY
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc (HONS), CHEMISTRY (FYUP), SEMESTER-I
Paper Name: Chemistry of Cosmetics and Perfumes
Paper Code: BCH-MIC-101

Time: 2.5 hours

Maximum Marks: 60

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; **Section B:** Answer any 3 out of 5; **Section C:** Answer all the questions, each question has an internal choice

Abbreviations Used

CLO- Course Outcome, PLO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

SECTION A

Q. No.	Question	BTL	CLO	PLO
Very Short Type Questions (Attempt all):		(1.5x10=15 marks)		
A 1.	Explain the use of ammonia and hydrogen peroxide in oxidative hair dyes.	2-3	1-3	1-3
A 2.	What is the role of emulsifying agents in the formulation of a cold cream? Give one example.	2-4	3-4	2-4
A 3.	What are sunscreens? Explain the significance of SPF in sunscreens.	1-3	2-3	2-5
A 4.	What are the ideal characteristics of nail lacquers?	1-2	2	3-4
A 5.	Why are preservatives used in various cosmetic preparations? Give one example of a preservative used in cosmetics.	2-4	2-5	3-5
A 6.	How do anti-perspirants function?	2	3	3
A 7.	What are gels? Explain its desirable properties.	2	3-4	3-4
A 8.	What is the difference between cosmetics and drugs? Give two examples of each.	2-5	3-5	3-4
A 9.	Mention one use each of eucalyptus oil, sandalwood, and rose oil in cosmetics.	2-4	3	2-3
A 10.	Talcum powder is made from talc. What are the three main elements in talc? What is the significance of zinc stearate in talcum powder?	1-3	3	2-3

SECTION B

Q. No.	Question	BTL	CLO	PLO
Long Type Questions (Attempt any TWO out of four):		(10x2=20 marks)		
B 1.	List the main ingredients of shampoo with their roles and explain the cleansing action of shampoo.	2-6	3-5	1-3
B 2.	What are the main ingredients in lipstick preparation? Give a detailed outline of the method of preparation of lipstick and its formulation.	2-6	2-5	2-4
B 3.	What are the common ingredients used in nail polish? What are their roles? Give a brief method of preparation of nail polish.	2-5	3-4	3-6
B 4.	Briefly discuss the role and mode of action of any five the following ingredients in cosmetic products: Titanium oxide, Nitrocellulose, Glycerin, Muscone, Lanolin, Triethanolamine, Kaoline	2-5	3-5	3-5

SECTION C

Q. No.	Question	BTL	CLO	PLO
Short Type Questions (Attempt all Questions):		(5x5=25 marks)		
C 1.	(a) What are the various categories of hair dyes? Discuss semi-permanent hair dye in detail. OR (b) What are the raw materials used in the manufacturing of deodorants? How are deodorants different from antiperspirants?	2-4 2-5	2-4	2-5 1-4
C 2.	(a) How are essential oils extracted from natural sources? Draw the structure of geraniol and illustrate its uses. OR (b) What are the toxic effects of cosmetics? How can they be minimized? Explain the role of aloe vera and turmeric in herbal cosmetics.	3-4 3-6	2-5	3-5 2-4
C 3.	(a) What is the importance of conditioners? What are the different types of surfactants used in shampoo? OR (b) Explain the formulation and method of preparation of suntan lotion. What is the difference between sunscreen and suntan lotion?	2-4 1-4	3-4	2-3 2-6
C 4.	(a) What are the properties of a good hair-removing cream? What are the two methods of hair removal? OR (b) What is the difference between vanishing creams and shaving creams? Give the steps involved in their formulation.	3-4 3-5	2-5	4-5 3-5
C 5.	(a) Specify the role of waxes and pigments used in lipstick. Give two examples of each. OR (b) What is the difference between hair gels and hair sprays? What is the use of propellants in hair sprays?	1-5 2-4	2-5	1-4 1-5

Roll Number

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) as per FYUP
Semester I (2023)
Paper Code: BBC/BBT/BBO/BCH/BTX/BCR MDC 101
Paper Title: BASICS OF STATISTICS

Time: 2 hours

Maximum Marks: 45

Write the Roll No. at the top immediately on receipt of this Question Paper. Attempt all Questions. All parts of the Question must be attempted in continuation. Start Answering each question on new page.

SECTION A

Fill in the blanks in the following questions. Answer all questions

[1x10 =10 marks]

1. Type II error is when the Null Hypothesis is _____ and Alternate Hypothesis is _____.
2. The limits indicate interquartile range are _____ and _____.
3. For a random sample of 35 observations had sample mean $\mu = 56.4$ and the standard deviation is $SD=5$. The values corresponding to 95% confidence interval are _____ and _____.
4. When findings from a study (sample population) are applied to the larger population, the statistics is known as _____.
5. When for a sample, the mean, median and mode are equal, it is called as _____.
6. The commonly used level for statistical significance level for p value is _____.
7. In hypothesis testing, when we say that there is β error of 20%, what is the power of the test _____?
8. A hypothesis testing resulted the p value as 0.07, the test findings shall be interpreted as statistically _____.
9. When a statistical test is to be used for hypothesis testing for means of three samples, the test to be used is _____.
10. When relationship (correlation) between variables is tested, the result is expressed as _____.

SECTION B

Attempt ANY THREE questions from the following.

[5x3=15]

1. In a study population of 1500, during data collection round in January 2020, 100 people were diabetic. In the same population, during January 2023, 175 people were found to be diabetic. What is the incidence of diabetes in the population?

Roll Number

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) as per FYUP
Semester I (2024)

Paper Code: BCH MDC 101
Paper Title: BASICS OF STATISTICS

Time: 2 hours

Maximum Marks: 45

Write the Roll No. at the top immediately upon receipt of this Question Paper. Attempt all Questions. All parts of the Question must be attempted in continuation. Start Answering each Question on a new page.

SECTION A

Question 1. Fill in the blanks in the following questions. Answer all questions

[1x10=10 marks]

- A. A survey in which information is collected from each and every individual of the population is known as _____.
- B. The number of classes and class interval for the distribution of marks from 0 to 100 of 50 students of a class should be _____ and _____, respectively.
- C. Histograms can be drawn only for _____ distributions.
- D. The mean of 8 numbers is 15. Afterward, a new number, 24, is added. The mean of the nine numbers is _____.
- E. The sum of squares of the deviations from the mean is always _____.
- F. If a variable takes some non-negative values $x_1, x_2, \dots, x_n$, then the inequality that holds between H.M., G.M., and A.M. is _____.
- G. If for an asymmetric distribution, the mean, median, and s.d. are 25, 15, and 10, respectively, the distribution is _____ skew.
- H. If two events, A and B, are disjoint, then the $P(A \cup B) =$ _____.
- I. The mean of binomial distribution $B(n, p)$ is _____, and its variance is _____.
- J. The number of independent values in a set of values is known as _____.

SECTION B

Question 2. Attempt ANY THREE questions from the following.

[5x3=15 marks]

- A. Name two kinds of statistical data and describe them in detail. Write the sources of these types of data.
- B. What do you understand by kurtosis? How do we ascertain kurtosis with the help of β_2 ? Discuss in detail using the graph.
- C. What is meant by hypothesis testing? Define the null hypothesis and alternative hypothesis. Write the step-wise procedure for testing the hypothesis.
- D. Define and elaborate on two types of errors in the testing of a hypothesis with the help of real-life examples.
- E. What do you understand by the correlation between two variables? Interpret the correlation coefficient values as -1, 1, and 0.

Roll Number

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) as per FYUP
Semester I (2024)

Paper Code: BCH MDC 101

Paper Title: BASICS OF STATISTICS

Time: 2 hours

Maximum Marks: 45

Write the Roll No. at the top immediately upon receipt of this Question Paper. Attempt all Questions. All parts of the Question must be attempted in continuation. Start Answering each Question on a new page.

SECTION A

Question 1. Fill in the blanks in the following questions. Answer all questions

[1x10 =10 marks]

- A. A survey in which information is collected from each and every individual of the population is known as _____.
- B. The number of classes and class interval for the distribution of marks from 0 to 100 of 50 students of a class should be _____ and _____, respectively.
- C. Histograms can be drawn only for _____ distributions.
- D. The mean of 8 numbers is 15. Afterward, a new number, 24, is added. The mean of the nine numbers is _____.
- E. The sum of squares of the deviations from the mean is always _____.
- F. If a variable takes some non-negative values $x_1, x_2, \dots, x_n$, then the inequality that holds between H.M., G.M., and A.M. is _____.
- G. If for an asymmetric distribution, the mean, median, and s.d. are 25, 15, and 10, respectively, the distribution is _____ skew.
- H. If two events, A and B, are disjoint, then the $P(A \cup B) =$ _____.
- I. The mean of binomial distribution $B(n, p)$ is _____, and its variance is _____.
- J. The number of independent values in a set of values is known as _____.

SECTION B

Question 2. Attempt ANY THREE questions from the following.

[5x3=15 marks]

- A. Name two kinds of statistical data and describe them in detail. Write the sources of these types of data.
- B. What do you understand by kurtosis? How do we ascertain kurtosis with the help of β_2 ? Discuss in detail using the graph.
- C. What is meant by hypothesis testing? Define the null hypothesis and alternative hypothesis. Write the step-wise procedure for testing the hypothesis.
- D. Define and elaborate on two types of errors in the testing of a hypothesis with the help of real-life examples.
- E. What do you understand by the correlation between two variables? Interpret the correlation coefficient values as -1, 1, and 0.

SECTION C

Question 3. Answer ANY TWO of the following questions.

[10 x 2=20 Marks]

- A. (i) Define the Poisson distribution with parameter λ and discuss the Poisson distribution additive property.
- (ii) In a book of 520 pages, 390 typo-graphical errors occur. Assuming Poisson law for the number of errors per page, find the probability that a random sample of 5 pages will contain no error.
- B. A sample analysis of examination results of 200 MBA's was made. It was found that 46 students had failed, 68 secured a third division, 62 secured a second division, and the rest were placed in the first division. Are these figures commensurate with the general examination result, which is in the 4 : 3 : 2 : 1 ratio for various categories, respectively? (χ^2 value at 5% level of significance for 3 d.f. = 7.815).
- C. A company has a head office in Kolkata and a branch in Mumbai. The personal director wanted to know if the workers at the two places would like the introduction of a new plan of work, and a survey was conducted for this purpose. Out of a sample of 500 workers at Kolkata, 62% favoured the new plan. Out of a sample of 400 workers in Mumbai, 41% were against the new plan. Write the null hypothesis and alternative hypothesis. Is there any significant difference between the two groups in their attitude towards the new plan at the 5% level? (Z value at 5% level of significance for the two-tailed test is 1.96).
- D. (i) What are the three axioms of probability? Discuss in detail.
- (ii) If $P(A) = 1/2$, $P(B) = 1/3$ and $P(A \cap B) = 1/4$, find $P(A^c)$, $P(A \cup B)$, $P(A/B)$ and $P(B/A)$. Are A and B independent?

---X---

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons. with Research)/ B.Sc. (Hons.) Chemistry
Supplementary Exam, Semester I (JULY 2024)
Paper Code: BCH MDC 101
Paper Title: BASICS OF STATISTICS

Time: 2 hours

Maximum Marks: 45

Write the Roll No. at top immediately upon receipt of the Question Paper. Attempt all Questions. All the parts of the Question must be attempted in continuation. Start answering each Question on a new page.

SECTION-A

Q1. Fill in the blanks in the following questions. Answer all questions. [1x10 =10 marks]

- A. Records provide _____ source of data.
- B. An average is a measure of _____.
- C. Histograms can be drawn only for _____ distribution.
- D. The median of a series is 10. Two additional observations 7 and 20 are added to the series. The median of the new series will be _____.
- E. The relationship between arithmetic mean, geometric mean and harmonic mean is _____.
- F. The square root of standard deviation is called _____.
- G. If two events, A and B, are mutually exclusive events, then the $P(A \cup B) =$ _____.
- H. Two variables are said to be _____ if the change in one variable results in corresponding change in other variable.
- I. The mean of binomial distribution $B(n, p)$ is _____, and its variance is _____.
- J. For a normal distribution, all measures of central tendency i.e., mean, median and mode are _____.

SECTION-B

Q2. Attempt ANY THREE questions from the following. [3x5 = 15 marks]

- A. Briefly explain primary and secondary data with examples.
- B. Draw positive and negative skewed frequency curves and mark the position of mean, median and mode on each curve.
- C. Differentiate between Type-I error and Type-II error with real life examples.
- D. Define the null and alternative hypothesis. Write the step-wise procedure for testing the hypothesis.
- E. Define the term correlation and with the help of an example differentiate Karl Pearson's and Spearman's rank correlation methods.

SECTION-C

Q3. Attempt ANY TWO questions from the following.

[10x2 = 20 marks]

- A. (a) Define Binomial distribution. Describe the main features of Binomial distribution.
(b) The survival rate for a particular disease is 20% and we have 10 patients with this disease. What is the probability that exactly 3 patients will survive.
- B. What are important measures used for central tendency and write its equations and terms.
- C. From the following data, compute the correlation between X & Y.

	X	Y
No. of items	15	15
Arithmetic Mean	25	18
Sum of squares of deviations from mean	136	138

Summation of product of deviations of X & Y series from the respective arithmetic means=122.

- D. Calculate mean deviation from mean values of the following data:

Class interval	0-4	4-8	8-12	12-16	16-20
Frequency	4	6	8	5	2

-----X-----

JAMIA HAMDARD
Department of Chemistry
School of Chemical and Life Sciences (SCLS)
B.Sc-Hons. with Research. Chemistry

Paper Name: Basics of Inorganic Chemistry

Paper Code: BCH-DSC101

Time: 3 hours *2½ hours*

Maximum Marks: 60

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 2 out of 4; Section C: Answer all the questions, each question has an internal choice

SECTION A

Very Short Type Questions

(10*2= 20 marks)

Q. No	Question	Marks	BTL-	CLO	PLO
1	Discuss why Li shows anomalous behaviour.	2	2	2	2
2	Why, do alkali metals give blue colour in liquid ammonia? Give chemical reaction.	2	3	2	3
3	Explain back bonding in BF ₃ molecule.	2	3	3	3
4	Give reason (s); the electron affinity of Cl is higher than other elements of group 17.	2	2	3	2
5	What is the inert pair effect? Explain by giving example.	2	3	3	2
6	SiO ₂ is solid but CO ₂ is a gas. Explain.	2	2	2	2
7	Define the terms: Polarizing power, Polarizability of ions.	2	2	2	2
8	SF ₄ exists while OF ₄ does not. Explain	2	2	3	2
9	Why, LiCl is covalent while NaCl is ionic. Explain.	2	2	3	2
10	Explain the catenation property of carbon. How does catenation tendency vary in Group 14 elements?	2	3	2	2

SECTION B

Long Type Questions

(2*10= 20 marks)

Q. No	Question	Marks	BTL-	CLO	PLO
1	a) What is Diagonal relationship? Why do beryllium and aluminium resemble each in their properties? b) Why does Be ²⁺ show a stronger tendency to form complexes. Explain.	05 05	3	3	2
2	Describe the preparation of sulphuric acid by contact or chamber process. Give its structure.	10	4	3	3
3	Give the preparation, properties and structure of the following: i) Cl ₂ O ii) Cl ₂ O ₆ iii) Cl ₂ O ₇	10	4	3	3
4	What are interhalogen compounds? Discuss the structure of various types. Why are interhalogen compounds more reactive than halogens? Explain.	10	3	3	3

SECTION C

Short-Type Questions

(4*5= 20 marks)

Q. No	Question	Marks	BTL-	CLO	PLO
1	What are electron-deficient compounds? Give the structure of the B ₂ H ₆ molecule. <i>Or</i> What are silicates? Give the structure of each type of silicate.	05	04	03	03

2	Why is borazine called inorganic benzene? Explain by giving a reason. <i>Or</i> Draw the structure of the following ions: i) SO_5^{2-} ii) $\text{S}_2\text{O}_7^{2-}$ iii) $\text{S}_2\text{O}_8^{2-}$	05	04	03	03
5	Explain carbonates and bicarbonates of s-block metals. <i>Or</i> Discuss Fajan's rules for covalent character in ionic compounds. Giving suitable examples.	05	03	03	03
7	What are pseudo halogens? Explain giving examples. <i>Or</i> Discuss the structure of the following: i) ICl_2^- ii) ICl_4^-	05	03	02	02

Roll No.....

Jamia Hamdard
Department of Chemistry
School of Chemical & Life Sciences
BSc. Hons. Chemistry (FYUP), Chemistry/Semester-I
Paper Title: Basics of Inorganic Chemistry
Paper Code: BCH-DSC101

Time: 2 ½ hours

Maximum Marks: 60

Abbreviations Used: CLO- Course Outcome, PLO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create.

Q. No.		BTL	CLO	PLO
SECTION A				
Very Short Type Questions (Attempt all):		(1x15=15 marks)		
A1	Justify: Maximum covalency of beryllium is four.	2	2	1-2
A2	Alkali metals are stored in kerosene oil. Why?	2	2	1-2
A3	What is inert pair effect?	1	2	2
A4	Give reason: First ionization enthalpy of boron is less than that of beryllium.	2	2	3
A5	Define allotropes.	1	1-2	1-2
A6	IF ₇ exists but ICl ₇ does not exist. Give reason.	2	3	3
A7	LiCl is soluble in organic solvents. Why?	1	2	2
A8	He and Ne do not form clathrate compounds. Give reason.	1	2	3
A9	Give the electronic configuration of Thallium (atomic number 81).	1	1-2	1-2
A10	Phosphoric acid is syrupy in nature. Why?	2	2-3	2-3
A11	What are Chalcogens?	1	1-2	1-2
A12	NH ₃ exists but NH ₅ doesn't.	2	2-3	3
A13	Oxidation states in germanium differ by a factor of two. Why?	2	3	2-3
A14	What happens when: silicon tetrachloride reacts with water.	2	1-2	1-2
A15	Calculate the bond order in oxygen molecule.	1	1-2	2
SECTION B				
Long Type Questions (Attempt any two out of four):		(10x2=20 marks)		
B1	(a) Why is white phosphorus more reactive than red phosphorus? Draw the structure of P ₄ O ₁₀ and give the stepwise mechanism of its hydrolysis. (b) Graphite is soft, has low density and is a good conductor of electricity but diamond is extremely hard, has high density and is a non-conductor of electricity. Explain why?	3	1-3	1-3
B2	(a) What is diagonal relationship? Explain taking examples of boron and silicon. (b) On reaction with air, Li predominantly forms monoxide, Na forms peroxide and other alkali metal forms superoxides. Give the balanced chemical reaction when sodium peroxide and cesium superoxide get hydrolyzed.	4-6	2-6	4-6

B3	(a) What are silicates? Briefly describe various types of silicates with suitable example. (b) (i) Discuss the geometry and shape of the given molecules /ions on the basis of VSEPR theory. (<i>Any three</i>): XeO_3, SF_4, ClO_4^-, ClF_3 (ii) What happens when SO_2 reacts with acidified $\text{K}_2\text{Cr}_2\text{O}_7$ solution? Give chemical reactions involved.	3-4	3-5	3-5
B4	(a) Discuss the structure and bonding in borazine. Give the similarities and differences between borazine and benzene, with suitable examples. (b) Explain and justify: $\text{SO}_{2(g)}$ and $\text{SO}_{3(g)}$ have same hybridization but different structures. Which one will behave as a lewis base and why?	4-5	3-6	3-6
SECTION C				
Short Type Questions (Attempt all Questions):		(5x5=25 marks)		
C1	(a) Give the balanced chemical reaction when: (i) lithium nitrate, (ii) Potassium nitrate is heated. Give explanation for the same. OR (b) Give reason for the following: (i) H_2O is a liquid whereas H_2S is a gas. (ii) Interhalogen compounds are more reactive than Halogens.	3-5	4-5	4-5
C2	(a) Arrange the following in increasing order of acidic strength by giving reasons. HClO_4, HClO_2, HClO_3, HOCl OR (b) Justify the statement: Unlike ethane, diborane is an electron deficient compound. How do you explain the structure of diborane then?	3	4	3-4
C3	(a) What happens when rhombic sulphur is gradually heated? Explain. OR (b) Calculate % ionic character of HX molecule. Given: dipole moment of HX = 1.92 D, bond distance, $\text{H}-\text{X} = 1.2 \text{ \AA}$, $e = 4.8 \times 10^{-10} \text{ esu}$	4-6	4	4-5
C4	(a) CO_2 is a gas whereas SiO_2 is a high melting solid. Explain. OR (b) Which one of the given molecules PbO & PbO_2 is more ionic? Explain why?	3-4	2-3	3-5
C5	(a) Lithium on burning in air, gives two compounds (X) and (Y). When treated with water, (X) liberates NH_3 gas, while aqueous solution of (Y) is basic in nature. Identify (X) and (Y) and give the balanced chemical reaction(s) involved, to justify your answer. OR (b) Name the peroxo acids of sulphur. Discuss their structure and give the oxidation state of 'S' in them.	5-6	3-6	4-6

Roll Number

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) as per FYUP
Semester I (2023)
Paper Code: BBC/BBT/BBO/BCH/BTX/BCR AEC 101
Paper Title: English Communication

Time: 1.5 hours

Maximum Marks: 30

Write your roll number at the top immediately on receipt of this question paper. Attempt ALL questions.

SECTION A

Question 1. Fill in the blanks with the correct option.

[1x8=8 marks]

- A. In a communication cycle the sender _____ (encodes/ decodes) the message.
- B. Chronemics is the study of how people use _____ (time, space) to communicate.
- C. Personal appearance falls within the study of _____ (proxemics, kinesics).
- D. We translate from a _____ (source, target) language to a _____ (source, target) language.

Question 2. Mention True or False for the following statements.

- A. An analysis of the text is not required when translating.
- B. Studying for an exam involves *intensive reading* of our texts.
- C. We should avoid the use of rhetoric in a public speech.
- D. Maintaining eye contact in an interview is a sign of being rude.

SECTION B

Question 3. Answer the following questions with the help of examples.

[4x3=12 marks]

- A. How does body language help in communication?
- B. What is proxemics? What role does it play in communication?
- C. Discuss 3 barriers to communication and explain how to avoid them?
- D. How should you prepare yourself for and behave during an interview to give your best impression?

SECTION C

Question 4. Answer the following questions.

[5x2=10 Marks]

A. Explain the process of translation and highlight the different kinds of translations that are possible. Talk about the 3 stages in the process and the different meanings found in a Source Text. Substantiate your arguments with examples.

B. Talk about the use of *rhetoric*, using examples, in a speech and explain how it is different from *empty rhetoric*. Also give examples to explain the difference between the two.

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JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) Semester I (2024)
Paper Code: BCH AEC 101
Paper Title: ENGLISH-I

Time: 1.5 hours

Maximum Marks: 30

Write the Roll No. at the top immediately on receipt of this Question Paper. Attempt all Questions. All parts of the question must be attempted in continuation. Start answering each question on new page.

SECTION A

Question 01. Answer all questions.

[1x 8 = 8 marks]

Fill in the blanks with the correct option.

- A. The key components of the communication process include the sender, _____, message, channel, receiver, decoding and feedback. (encoding/transmitting).
- B. Nonverbal communication includes gestures, facial expressions, body language, and other forms of communication that do not rely on _____. (words/ meanings).
- C. Communication _____ refers to anything that interferes with the successful transmission and reception of a message. (language/noise)
- D. The study of how individuals use time to communicate is called _____. (kinesics/chronemics).

Mention True/False against each sentence.

- E. In the communication process, noise always refers to loud sounds in the environment.
- F. Feedback in communication is typically unimportant and can be disregarded.
- G. Nonverbal communication includes only gestures and facial expressions, excluding body language.
- H. A teacher always indulges in appreciative listening in a classroom.

SECTION B

Question 2. Answer ANY THREE of the following questions.

[3x4=12 marks]

- A. What is the purpose of "nonverbal communication" in English communication theory?
- B. Explain the process of communication specifying each step.
- C. Compare and explain with examples the 3 techniques of reading— scanning, skimming and intensive reading.
- E. Explain the difference between a monologue and dialogue?

SECTION C

[2x5=10 marks]

Question 3. Answer ANY TWO of the following questions in detail.

- A.** Why do cultural barriers occur in communication? What can we do to avoid such cultural barriers? Explain with examples.
- B.** What is the significance of feedback in the process of communication? How do you, as a student, give feedback in a classroom? — include verbal and non-verbal examples.
- C.** Using examples, explain the concept of paralanguage and the different dimensions it is based on in non-verbal communication.

-----X-----

JAMIA HAMDARD
DEPARTMENT OF CHEMISTRY
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.SC-HONS. WITH RESEARCH. CHEMISTRY

Roll No. _____

SEMESTER I

End term Examination 2023

Paper Name: Water Treatment and Management Studies
Time: 2hrs

Paper Code: BCH-SEC-101
Max. Marks: 45

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; **Section B:** Answer any 2 out of 4; **Section C:** Answer all the questions, each question has an internal choice

Abbreviations Used CO- Course Outcome, CLO- Course Learning Outcome, PO- Program Outcome, PLO- Program learning Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2- Understand; BT level 3- Apply; BT level 4-Analyze; BT level 5- Evaluate, BT level 6- Create

SECTION A

Very Short Type Questions (Attempt all)

Q. No	Question	Marks	BTL-	CLO	PLO
1	Expand the following terms a) TDS; b) TSS c) BOD d) COD	1	1,2	1,2	1,2,3
2	Briefly Define Chelation.	1	1	2	2,3
3	What will be the resulting TDS (in ppm) for the following combination: 2.0 L of 32ppm water with 1.0 L of 180ppm water Also, mention whether the formed solution will have a TDS value within permissible limits.	1	2	1,2	2,4
4	What are the elements which are being found in water resources due to E-waste?	1	1,2	2,3	1,3
5	Enlist any two changes observed in water with an excess of Fe^{+2} /or Fe^{+3} ions	1	1,2	3	1,2,4
6	Differentiate between coagulation and precipitation	1.5	2	2,3	1,2,3
7	Define melting point and depression in freezing point	1	2	1,2	1,2,3
8	What is the role of activated charcoal in water purification?	1.5	2,3	3	3,4
9	What is the role of UV-irradiation in water treatment?	1	2,3	3	3,4
10	Arrange the following in decreasing trend of TDS a) Rainwater; b) Sea water; c) River water Justify your answer.	1	1,2	1,2,3	3,4,5

SECTION B

Long type Questions (Attempt any two out of four)

Q. No	Question	Marks	BTL-	CLO	PLO
1	Define briefly about Biological Index, and explain how <i>E.coli</i> enters the water body. Which of the following will have the highest BOD and Biological Index: a) hot spring water; b) sea water and c) ice berg. Justify your answer.	6.5	3,4,5	2-3	3,6,7
2	On the basis of the periodic table mention elements or groups which affect water and air on Earth.	6.5	3,4,5	1-3	3-4

	Also discuss the elements abundant in E-waste.				
3	Classify water on Earth with the help of a distribution chart or bar diagram.	6.5	1,2,3,4	1-2	2-4
4	What are various methods for removing i) Insoluble solid; ii) Suspended Solid; iii) Colloidal Solid and Dissolved Solid Arrange the following gases in increasing trend of their solubility in water also mention their reaction with H ₂ O (if any) a) CO ₂ ; b) SO ₂ ; c) NO ₂ ; d) CO and e) H ₂ S	6.5	3,4	2-3	2-5

SECTION C

Short-type Questions. (Attempt all questions, each question has an internal choice)

Q. No	Question	Marks	BTL-	CLO	PLO
1	Write the reactions involved in formation of acid rain. Or Explain the reasons of color in water also explain the oxidation states of metal involved in color of water (if any)	3	4,5	2-3	3-4
2	Explain the effect of CO ₂ as a) Water pollutant b) Air pollutant Or Explain the effect of SO ₂ as a) Water pollutant b) Soil pollutant	3	3,4	3-4	3-5
3	Differentiate between temporary and permanent hardness. Also explain the method for determining the temporary and permanent hardness. Or Explain the health hazards associated with Hg ⁺² . Give a simple method for determining mercury in water.	3	4,5	2-4	3-7
4	Enlist any two disadvantages of chlorination method in water treatment. Or Enlist any two methods for removing Iron during in water treatment.	3	3,4	3-4	3-5
5	How Human Impact on the environment could be measured. Or. Briefly explain AMOEBA approach in assessing Human Impact on the environment.	3	4,5	4	3,5,7
6	What are the various components of environment. Or How we can classify pollutants based on periodic table.	3	2,3	2,3	3-5
7	Explain Thiele's tube method for the determination of boiling point. Justify the effect on boiling point of impure water then in comparison to distilled water. Or Stepwise explain the method for determination TDS and TSS for a given sample of water in laboratory.	3	5,6	4	5-7

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Roll No. _____

JAMIA HAMDARD
Department of Chemistry
School of Chemical and Life Sciences (SCLS)
B.Sc. Hons Chemistry (FYUP), I Semester
Odd Semester Examination 2024

Paper Name: Water Treatment and Management

Paper Code: BCH-SEC01

Time: 2 hours

Maximum Marks: 45

Note: Write your roll number at the top of the question paper. This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 2 out of 4; Section C: Answer all the questions, each question has an internal choice.

Abbreviations Used CLO- Course Outcome, PLO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Q.No	Question	Marks	BTL	CLO	PLO
<u>SECTION-A</u>					
Very Short type Questions: Attempt all		(1 x 10 = 10 marks)			
1	Name three types of environmental pollution and provide a brief description of one.	1	1	1-2	2
2	Expand the following acronyms: a) BOD; b) COD	1	1,2	1-2	1
3	Arrange the following water in order of decreasing BOD: a) rain water; b) pond water; c) River water; d) Hot Spring	1	3	3-4	4
4	Define Chelating Agents. Give one example	1	2-3	2-3	3
5	Define AMOEBA plot.	1	3-4	2-3	3
6	Give two major elements associated with E-waste	1	2	2	2
7	A water sample has an initial dissolved oxygen (DO) concentration of 8 mg/L. After incubating the sample in the dark at 20°C for 5 days, the final DO concentration is measured to be 2 mg/L. Calculate the Biochemical Oxygen Demand (BOD) of the water sample.	1	4-5	3-4	5
8	Calculate the Total Dissolved Solids (TDS) in a water sample with following ion concentrations: Sodium (50 mg/L); Calcium (30 mg/L), Chloride (40 mg/L); bicarbonate (20 mg/L)	1	4-5	4	5
9	Define Hardness of water. Method for the determination of hardness of water.	1	3	4	3-4
10	Define saponification value. Give its use in water treatment.	1	3	4	3-4
<u>SECTION B</u>					
Long Type Questions (Attempt any two out of four):		(10x2=20 marks)			
B1	Explain Softening of water using a) Ion Exchange process and b) Chelating agents	10	4-5	4-5	4-5

B2	How Coagulation and Flocculation are performed in water. Give one example of chemical agents for performing coagulation and flocculation	10	4-5	5	4-5
B3	What are the titration techniques can be employed in the estimation of pollution in water?	10	5-6	3	3-4
B4	Explain potability of water and Chemical substances affecting potability.	10	5-6	2-3	3

SECTION C

Short Type Questions (Attempt all Questions):		(3x5=15 marks)			
C1	(a) What does Biochemical Oxygen Demand (BOD) measure in water, and why is it considered an essential parameter in assessing water quality	3	3-5	3	3
	Or				
	(b) Flame based analysis could be used for the detection of cation in water, support this comment with two suitable examples	3	3-5	2	2
C2	(a) Differentiate between the Osmosis and reverse Osmosis.	3	2-4	3-4	3-4
	Or				
	(b) What are colligative properties?	3			
C3	Give methods for the determination of: a) As and Hg.	3	1-4	3-4	3
	Or				
	b) Fe and Cu	3		3	3
C4	(a) Explain distribution of water on Earth with the help of diagram.	3	3-4	2-3	4
	Or				
	(b) What is the effect of the following ions on quality of water: i) Sulphide, ii) Co and iii) Nitrate	3	5-6	4	
C5	(a) Explain reason for the following a) Acid rain; b) Minamata disease	3	1-3	4	4
	Or				
	(b) If in a given sample of water on treating with BaCl ₂ , a total 2.33gm of precipitate was obtained. What does this signify and evaluate the numerical importance of obtained result	3	4-6	4	4

Roll Number

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) as per FYUP
Semester I (2023)
Paper Code: BBC/BBT/BBO/BCH/BTX/BCR VAC 102
Paper Title: Understanding India

Time: 1.5 hours

Maximum Marks: 30

Write the Roll No. at the top immediately on receipt of this Question Paper. Attempt all Questions. All parts of the Question must be attempted in continuation. Start Answering each question on new page.

SECTION A

Answer all Questions.

[1×8=08 MARKS]

1. *Bharatvarsha*, refers to land of which legendary King ?
2. The Rig Vedic tribes *Janas* were communities without fixed territories, in the later *Brahmana* texts they were associated with _____ (Larger Tribal settlements).
3. The Rigveda Samhita is arranged in _____ Books(Mandalas).
4. *Mahajanpads* are _____ in number.
5. Bimbisara, The Monarch of _____ dynasty was a contemporary of Buddha.
6. Doctrine of Lapse was proposed by _____.
7. Nana Sahib led the revolt of 1857 from _____.
8. 12. C.V Raman is known for his work in the field of _____.

SECTION B

Attempt all Questions

[3×4=12 Marks]

1. What were the *Mahajanpads*? Mentions names of few *Mahajanpads*?
2. Who was Mangal Panday?
3. Write a brief note on the contributions of Aryabhatta?
4. Briefly introduce languages of India?

SECTION C

Attempt ANY TWO of the following [2×5=10 Marks]

1. Explain the concept of Bharatvarsha with special focus on Vedic tradition.
2. Discuss Revolt of 1857 as the first war of Independence.
3. Discuss *Atmanirbhar* Bharat.
4. Write a detailed note on the contributions of India to the field of Medicine and Science during pre-modern Era.

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JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) as per FYUP
Semester I (2024)
Paper Code: BCH VAC 102
Paper Title: Understanding India

Time: 1.5 hours

Maximum Marks: 30

Write the Roll No. at the top immediately on receipt of this Question Paper. Attempt all Questions. All parts of the Question must be attempted in continuation. Start Answering each question on new page.

SECTION A

Q1. Answer ALL questions

(1 × 8 = 08 Marks)

- A. Why did the religion become a rallying cry of the Revolt of 1857?
- B. Who was Mangal Pandey?
- C. What was the main contribution of Maulana Abul Kalam Azad in the history of India?
- D. Why did the Mughals, especially Humayun and Akbar, promote the Persian language in the Mughal court?
- E. Who formulated the Doctrine of Lapse?
- F. Who wrote the book 'The Indian War of Independence of 1857'?
- G. Who wrote the famous book 'Discovery of India'?
- H. State the chief contribution of Sardar Vallabhbhai Patel in the history of India.

SECTION B

Q2. Attempt ANY THREE of the following questions

(3 × 4 = 12 Marks)

- A. State briefly the evolution of the concept of Bharatvarsha.
- B. Examine the development of science and technology in post-independence India.
- C. How can you prove that India is a land of diversities? Explain it analytically.
- D. What was Lord Curzon's main motive in partitioning Bengal? Analyze the political trends that developed during the Swadeshi Movement.

SECTION C

Q3. Attempt ANY TWO of the following questions

(5 × 2 = 10 Marks)

- A. Critically explain the development of medicines and science and technology during the Sultanate and the Mughal periods.
- B. Critically examine the nature of the Revolt of 1857.
- C. Elucidate the impact of the freedom movement on the scientific development in colonial India.
- D. Illuminate analytically the different models regarding the formation of state in pre-colonial India.

---> End <---

Roll Number

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES
B.Sc. (Hons with Research)/ B.Sc. (Hons) as per FYUP
Semester I (2023)

Paper Code: BBC/BBT/BBO/BCH/BTX/BCR VAC 101

Paper Title: ENVIRONMENTAL SCIENCE

Time: 1.5 hours

Maximum Marks: 30

Write the Roll No. at the top immediately on receipt of this Question Paper. Attempt all Questions. All parts of the Question must be attempted in continuation. Start Answering each question on new page.

SECTION A

Briefly answer ANY EIGHT of the following

[8x1=8 marks]

1. Give **ONE** example each of renewable and non-renewable resources.
2. Which pyramid is always upright?
3. Mention any **ONE** example of *in-situ* and *ex-situ* methods of conservation.
4. Define heavy metal citing an example.
5. When is the World Environment Day celebrated annually?
6. Give **ONE** example each of a primary and secondary air pollutant.
7. Name the personality who founded and led the Chipko Andolan.
8. What causes acid rain?
9. Differentiate between BOD and COD.
10. Define biomagnification.

SECTION B

Answer ANY FOUR of the following

[4x3=12 marks]

1. List the major causes and consequences of deforestation.
2. What are the biotic and abiotic components of an ecosystem?
3. Discuss various sources of marine pollution. How can you prevent pollution of oceans?
4. Briefly write about the Bhopal Gas Tragedy and Chernobyl nuclear disaster.
5. What are the major threats to biodiversity?
6. What are the different methods to propagate environmental awareness in the society?

SECTION C

Answer ANY TWO of the following

[2x5=10 marks]

1. Define environmental pollution and describe the different types of pollution.
2. What are biogeochemical cycles? Explain nitrogen cycle with the help of a neat labelled diagram.
3. Define population growth and discuss the factors affecting population growth.
4. Describe climate change, global warming, and ozone layer depletion.

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B.Sc. (Hons. with Research) / B.Sc. (Hons.) Biochemistry
I SEMESTER EXAMINATION FEBRUARY-MARCH 2024

Paper Name: **Environmental Sciences**

Paper Code: **BCH-VAC101**

Time: **1½ hours**

Maximum Marks: **30**

Note: This paper has 3 sections A, B, and C.

Section A: Attempt any 8 out of 10. **Section B:** Attempt any 4 out of 5.

Section C: Attempt any 2 out of 3.

Instructions: An equal representation of each course outcome should be done in each section.

Abbreviations used:

CO-Course Outcomes

CLO 1: identify the concepts related to the environmental global scenario (remember);

CLO 2: comprehend the natural resources and environmental organizations (understand);

CLO 3: apply the acquired knowledge to sensitize individuals and public about the environmental crisis (apply);

CLO 4: analyze the causes and changes in the structure of biodiversity (analyze); and

CLO 5: enhance their skills in the society by solving the environmental problems and preserving nature by the acquired knowledge (evaluate).

BTL-Bloom's Taxonomy Levels

1- Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating

SECTION A

Very Short Type Question (Attempt any eight out of ten)

8 x 1 = 8 marks

Q.No.	Questions	Marks	CO	BTL
1	_____ resources are irreplaceable after they are used.	1	1	1
2	_____ is a mixture of smoke and fog	1	3	3
3	_____ is defined as the process or state of environment that can be maintained indefinitely.	1	1	1
4	In Bhopal Gas tragedy in 1984, at the Union Carbide India Limited, _____ gas leaked.	1	3	1
5.	When primary pollutants combine with each other they form several _____ pollutants.	1	1	1
6.	Silent Valley National park is located in _____ state of India.	1	3	1
7.	Sound is measured in units called _____.	1	5	1
8.	IUCN stands for _____.	1	1	1
9.	Species that anchor/house many species with itself in the food chain and food pyramid are called _____ species.	1	2	5
10.	_____ is the lowest layer of earth's atmosphere.	1	1	1

Please turn over

SECTION B

Short Type Question. (Attempt any four out of five)

4 x 3 = 12 marks

Q.No.	Question	Marks	CLO	BTL
1	What is the difference between food chain and food web?	3	1	3
2	What is water pollution? How is the point source of pollution different from the diffused/non-point source of pollution?	3	3	4
3	Discuss the importance of Chipko movement.	3	5	4
4	What are the effects of air pollution on living organisms?	3	5	5
5	What is the importance of solid waste management?	3	3	6

SECTION C

Long type Question (Attempt any two out of three)

2 x 5 = 10 marks

Q.No.	Question	Marks	CO	BTL
1	What do you understand by conservation? Discuss briefly, the steps taken at governmental level to conserve wildlife.	5	3	5
2	What are the various levels of Biological diversity?	5	4	2
3	What is a Disaster? Discuss causes of landslides in view of the latest landslide episodes in Uttarakhand? What steps can be taken to prevent such disaster?	5	3	5,6

B.Sc (Semester I) (FYUP)
UNDERSTANDING INDIA
SESSIONAL-01

Maximum marks: 30

Duration: 30 mins

Name:

Department:

Note: Please answer all question by selecting any ONE of the options.

Q. 1. How many Mahajanapadas or 'Great Kingdoms' existed in ancient India during the lifetime of Lord Gautam Buddha?

- A: 12
- B: 10
- C: 16
- D: 14

Q. 2. Which was the earliest capital of Magadha?

- A: Vaishali
- B: Benarash
- C: Rajgir
- D: Patliputra

Q. 3. Taxila was the capital of which ancient Mahajanpada ?

- A: Gandhar
- B: Anga
- C: Magadha
- D: Kasi

Q. 4. Who among the following rulers transferred his capital from Rajgir to Patliputra?

- A: Ajatastaru
- B: Udayin
- C: Ashoka
- D: Vishnugupta

Q. 5. To which dynasty did Bimbisara, the ruler of Magadh belonged to?

- A: Nanda dynasty
- B: Haryanka dynasty
- C: Sisunaga dynasty

Q. 6. The Arthashastra of Kautilya is a?

- (A) Play about Chandragupta Maurya
- (B) Biography
- (C) History of Chandragupta Maurya
- (D) Book on Principles of Government

Q. 7. The inscriptions of Ashoka and the Brahmi script were deciphered by ?

- A: Alexander Cunningham
- B: James Prinsep
- C: Max Muller
- D: Moretime Wheeler

Q. 8. What was Ashoka's dhamma about?

- A: Propaganda of Ashoka's greatness
- B: It contained Buddhist doctrines

- C: It was a simple code of morality
- D: None of the above

Q. 9. Third Buddhist Council was held during whose reign?
A: Chandragupta Maurya
B: Bindusara
C: Ashoka
D: Kanishka

Q. 10. Which one of the following officials was not a part of the Mauryan administration?
A: Agraharika
B: Yukta
C: Pradeshika
D: Rajjuka

Q. 11. Which of the following foreigners invaded India first, after the decline of the Mauryan empire?
A: Bactrian Greeks
B: Parthians
C: Scythians
D: Kushans

Q. 12. The reign of which of the following reigns was known as golden age for Mathura school of art?
A: Indo-Greeks
B: Sakas
C: Kushans
D: Guptas

Q. 13. During the reign of which Kushana king, the Fourth Buddhist Council was held?
A: Vima Kadaphises
B: Hushka
C: Kanishka
D: Vasudeva

Q. 14. The rulers of which among the following dynasties adopted the title Devaputra ?
A: Mauryas
B: Guptas
C: Kushans
D: Shungas

Q. 15. During the Gupta rule, the territory was divided into bhuktis which were headed by?
A: Vishayapati
B: Uparik
C: Gramika
D: Kumaramatyas

Q. 16. Which Gupta king has been called an "Indian Napoleon" for having brought under his control a considerable portion of Indian territory?

- A: Chandragupta I
- B: Samudragupta
- C: Chandragupta II
- D: Skandagupta

Q. 17. The main source of Samudragupta's history is the famous Allahabad pillar inscription engraved on an Ashokan pillar. It was composed by?

- A: Nagasena
- B: Kalidasa
- C: Bhavabhuti
- D: Harisena

Q. 18. Who of the following Gupta rulers was known as Vikramaditya?

- A: Chandragupta I
- B: Samudragupta
- C: Chandragupta II
- D: Skandagupta

Q. 19. The famous Mehrauli Iron Pillar describes the exploits of a king generally identified with?

- A: Chandragupta I
- B: Samudragupta
- C: Chandragupta II
- D: Skandagupta

Q. 20. Who among the following wrote Abhijnanashakuntalam?

- A: Shudraka
- B: Kalidasa
- C: Vishakadatta
- D: Amarasinghp

Q. 21. Who among the following Pallava kings assumed the title of "Vatapikonda" (Conqueror of Vatapi)?

- A: Simhavishnu
- B: Mahendravarman I
- C: Narasimhavarman I
- D: Paramesvaravarman

Q. 22. Who among the following Pallava kings is credited with the construction of Shore temple at Mamallapuram and the Kailasanatha temple at Kanchi?

- A: Nandivarman II
- B: Mahendravarman II
- C: Narasimhavarman II
- D: Paramesvaravarman

Q. 23. Where did the Revolt of 1857 first break out?

- A: Delhi
- B: Agra
- C: Lucknow
- D: Meerut

Q. 24. The Uprising of 1857 was described as the first Indian war of Independence by?

- A: S. N Sen
- B: R. C Majumdar
- C: B. G Tilak
- D: V. D Savarkar

Q. 25. The leader of the Revolt of 1857 in Lucknow was?

- A: Kunwar Singh
- B: Nana Sahib
- C: Maulavi Ahmadullah
- D: Begum Hazrat Mahal

Q. 26. Which act brought significant administrative changes after the Revolt of 1857?

- A: Act of 1858
- B: Act of 1861
- C: Act of 1860
- D: Act of 1865

Q. 27. Who among the following leaders of Indian National Movement is known as the "Grand Old Man of India"?

- A: Gopal Krishna Gokhale
- B: Dadabhai Naoroji
- C: B. G Tilak
- D: V. D Savarkar

Q. 28. Who among the following founded the newspapers, the Maharatta and the Kesari, for the national cause?

- A: Gopal Krishna Gokhale
- B: Bipin Chandra Pal
- C: B. G Tilak
- D: Lala Lajpat Rai

Q. 29. During the Quit India Movement of 1942, who gave the call "Do Or Die"?

- A: Aruna Asaf Ali
- B: R. M. Lohia
- C: M. K. Gandhi
- D: J. P Narayan

Q. 30. Who wrote "India Wins Freedom"?

- A: Maulana Abul Kalam Azad
- B: S. C. Bose
- C: B. G Tilak
- D: Bhagat Singh

[PART A]

Name.....

Department.....

B.Sc. Semester 1 Sessional Examination 2023

Environmental Studies

School of Chemical and Life Sciences, Jamia Hamdard

Time: 30 minutes

Maximum Marks: 20

1. Multiple Choice Questions. Choose the correct answer.

[5x1=5 marks]

1. The concept of Sustainable Development was introduced to the world by

- | | |
|-------------------------------|------------------------|
| a) Brudland Commission Report | c) Brudland Plot Guide |
| b) UNESCO Commission Report | d) Nakagwa's Report |

2. How many SDG's have been made by UN to transform our world?

- | | |
|-------|-------|
| a) 7 | c) 27 |
| b) 17 | d) 14 |

3. Accidental release of which gas led to Bhopal Gas Tragedy?

- | | |
|----------------------|---------------------|
| a) Methyl isocyanate | c) Mercuric carbide |
| b) Carbon-monoxide | d) All of these |

4. Which river got polluted by the factories in Nepal that led to endangered fishes, dolphins in that area?

- | | |
|-------------|-----------------|
| a) Chile | c) Prumaya |
| b) Narayani | d) Both a and c |

5. The major steps in mining are

- a) Prospecting, exploration, development and exploitation
- b) Prospecting, exploration, exploitation and development
- c) Exploration, prospecting, development and exploitation
- d) None of these

2. Discuss differences between renewable and non-renewable resources.

[1x5=5 marks]

3. Answer ANYONE of the following.

[1x10=10 marks]

A. Explain functions of forest.

B. What are the problems created by dams?

Write your Answer on this page only. No extra sheet will be provided.

