02/11/23 FY BSC F.C

231102 FASC12301

FOUNDATION COURSE

PAPER-I (Sem-I) 2023

(2 ½ Hours) **[Total Marks : 75]**

N.B : (1) **All** questions are **compulsory**.

(2) **Figures** to the **right** indicate **full** marks.

Q.1(a) Choose the correct alternative (any **eight**) **08 Marks**

i) Indian society is_____in nature.
(Tribal, Pluralistic, Urban, Rural)

ii) The Indian constitution has recognised _____major languages.
(21,22, 23,25)

iii) Dowry harassment is _____violence.
(Criminal, Social, Political ,Domestic)

iv) Deficiency in Vitamin _____may cause blindness.

(A,B,C,D)

v)_____means division of a country in to small administrative regions.

(Communalism, Casteism, Regionalism ,Linguism)

vi) _____arises out of religious fundamentalism.

(Communalism,Casteism,Secularism,Linguism)

vii) The_____to the Constitution is called Preamble.

(Introductory note,Foot note,End note,Thanking note)

viii) Article 51 of the Constitution of India lists down _____fundamental duties of the citizens of India.

(11,12,13,14)

ix)The urban areas in India are looked after by the_____.

(Municipalities, State ,Panchayati Raj ,Taluka)

x)_____ was the first state to establish Panchayati Raj system in India.

(Rajasthan, Maharashtra, Gujarat, kerala)

(b) State whether the following statements are **True** or **False** (any **seven**) **07 Marks**

i) Marathi belongs to Indo-Aryan family of languages

P.T.O

ii)Bible is the holy book of Jews.

iii)Raja Ram Mohan Roy organised a movement to oppose the practice of .Sati.

iv)Cataract is not related to blindness.

v) Communalism is opposed to secularism

vi) Caste system promotes social progress and modernization.

vii)There is reservation of seats for women in state legislature.

viii) Trinamool Congress is a national party.

ix)The constitution of India confers single citizenship.

x) India has a uniform civil code

Q.2 What are the religious and lingual characteristics of Indian society ? **15Marks**

OR

Comment on rural and urban characteristics of Indian society.

Q.3 Discuss the problems faced by Indian women. What steps should be taken to prevent violence against them? **15 Marks**

OR

Explain the various issues relating to visually and auditorilly challenged persons.

Q.4 Discuss the causes of communalism? What measures can be taken to tackle the problem? **15 Marks**

OR

Write a detailed note on regionalism.

Q.5 Describe the importance and features of Indian constitution.

OR

Write short notes on (any **three**) : **15**

(a) Racial groups in India
(b) Physically challenged persons
(c) Role of mass media towards women
(d) Fundamental duties of an Indian citizen
(e) Role of Municipalities

F Y B Sc CHE - I

231103 03/11/23 FS12303 Reg.

RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE

F.Y.B.Sc. CHOICE BASED (Regular 2023-24) SEMESTER-I CHEMISTRY: PAPER I

(Time: 2½ Hours) Total Marks: 75

N.B.: (1) All questions are compulsory.
(2) Figures to the right indicate full marks.
(3) Use of log table/ non-programmable calculator is allowed.

Q1 A Multiple choice question (any 5 out of 7) **5M**

1 _____ equation is the expression for the first law of thermodynamics.
a) $q = \Delta E - w$ b) $q = w - \Delta E$ c) $\Delta E = w - q$

2 The flow of heat from higher to lower temperature is _____ process.
a) Reversible b) Irreversible c) Isochoric

3 Extensive property from the following is _____
a) Density b) Free energy c) Temperature

4 For exothermic reaction enthalpy change is _____
a) Negative b) Positive c) Zero

5 The branch of chemistry, which deals with the heat changes caused by chemical reactions, is called_____
a) Thermodynamics b) Thermal chemistry c) Thermochemistry

6 In Isobaric process pressure of the system is _____
a) Positive b) Negative c) Constant

7 $1dm^3$ of 1M HNO_3 contains _____ moles of HNO_3.
a) 1 b) 1.6 c) 16

Q1 B Match the columns (any 5 out of 7) **5M**

1	Ionic radius	a)	orbitals lie on the axes
2	Ionisation energy	b)	Spherical shaped
3	$d_{x^2-y^2}$	c)	J.J. Thomson
4	d_{xy}	d)	Dumbbell shaped
5	p orbital	e)	Increases down the group
6	s orbital	f)	Orbital lie between the axes
7	Plum pudding model	g)	Decreases down the group

Q1 C True or False (any 5 out of 7) **5M**

1 According to IUPAC rule , the shortest carbon chain is selected and considered as parent alkane.
2 Ethane has sp^3 hybridization.
3 Pi bond is weaker than sigma bond
4 The inductive effect is represented by an arrow head in the middle of bond
5 Nucleophiles are electron rich molecules which donate electron pairs .
6 Inductive effect is caused due to difference in electronegativities
7 The actual structure of the molecule is called resonance hybrid .

Q2 **Attempt any 4** **20M**

A Define:
1) The first law of thermodynamics
2) Internal energy
3) Enthalpy

B Define
1) Open system
2) Isothermal process
3) Isobaric process
4) Path function

C Calculate the ΔH° for the reaction
$CO_{2(g)} + H_2 \rightarrow CO_{(g)} + H_2O_{(g)}$
Given that ΔH°_f of $CO_{2(g)}$, $CO_{(g)}$ and $H_2O_{(g)}$ are -393.5 $KJmol^{-1}$, -111.3 $KJmol^{-1}$ and -241.80 $KJmol^{-1}$.

D Derive Kirchhoff's equation.

E 4.8 grams of KCl is dissolved in water and making the volume of the solution to 250 cm^3. Calculate the concentration of KCl solution in millimoles. (Molar mass of KCl=74.5 gm mol^{-1})

F Define Normality.
How many grams of solute are required to prepare one litre of 0.2N solution of
a) NaOH
b) $Pb(NO_3)_2$
[At. Wt. of Na=23, 0=16, H=1, Pb=207, N=14]

Q3 **Attempt any 4** **20M**

A Explain Rutherford's atomic model? What were the limitations of the model?

B Explain i) Hund's rule of maximum multiplicity ii) Pauli's exclusion principle

C Calculate the number of radial nodes in: **i)** 5p **ii)** 5d **iii)** 5f **iv)** 5s **v)** 2p

D Write a note on ionisation enthalpy. Discuss the factors affecting ionisation enthalpy. How does it vary (**i**) across the period and (**ii**) down the group?

E Write a note on electronegativity. Discuss the factors affecting electronegativity. How does it vary (**i**) across the period and (**ii**) down the group?

F Explain Slater rule in brief. Calculate the effective nuclear charge experienced by 4s electron in Iron (Z= 26)

Q4 **Attempt any 4** **20M**

A Give a brief note on inductive effect.

B What is reagent? Distinguish between nucleophilicity and basicity.

C Explain carbocation as reactive intermediate.

D How the reaction are classified on the basis of changes occuring in the substrate.

E Explain the shape and bonding in ethane molecule

F Draw structures of the following compounds from the names given
1.propane-1,3-dioic acid
2. butane-1,3-diol
3. but-1-en-3-yne
4. oct-2-en-1-al
5. 3-bromo-5-chlorohexane

231104 FS12308

RIZVI COLLEGE OF ARTS, SCIENCE AND COMMERCE

F.Y.B.Sc. CHOICE BASED (Regular 2023-24) SEMESTER-I CHEMISTRY: PAPER II

(Time: 2½ Hours) Total Marks: 75

N.B.: (1) All questions are compulsory.
(2) Figures to the right indicate full marks.
(3) Use of log table/ non-programmable calculator is allowed.

Q1 A Multiple choice question (any 5 out of 7) **5M**

1 For the first order reaction, the rate constant is given by the expression ____
a) $k = x/t$ **b)** $k = 1/at.\ x/(a-x)$ **c)** $k = 2.303/t\ .\ \log a/(a-x)$

2 When 100 ml of 0.01M ethyl acetate react with 100 ml of 0.01m NaOH, the unit of the rate constant is _____
a) $mol\ s^{-1}$ **b)** $dm^3\ nol^{-1}\ s^{-1}$ **c)** $mol\ dm^{-3}\ s^{-1}$

3 The increase in reaction rate with temperature is due to _____ in the number of molecules having energy of activation.
a) increase **b)** decrease **c)** no change

4 The saponification of ethyl acetate is a reaction of _____ order.
a) First **b)** Second **c)** none of the above

5 With the increasing molecular mass of a liquid, the viscosity _____
a) decreases **b)** increases **c)** no effect

6 Which of the following decrease surface tension of a liquid:
1) increase in temperature of the liquid
2) mixing of detergent in the liquid
3) decrease in temperature
These can be:
a) II, III **b)** I, II **c)** II only

7 Poise is the unit of _____
a) Viscosity **b)** Surface tension **c)** Refractive index

Q1 B Match the columns (any 5 out of 7) **5M**

1	Graphite	**a)**	Normal Oxide
2	Li_2O	**b)**	Lime water
3	Li_2O_2	**c)**	Allotrope of Carbon
4	CFCs	**d)**	Antacid
5	PAN	**e)**	Ozone depletion
6	Magnesium hydroxide	**f)**	Photochemical smog
7	Calcium hydroxide	**g)**	Peroxide

Q1 C True or False (any 5 out of 7) **5M**

1 Fischer projection formulae represents staggered conformation.
2 Geometrical isomer are also called diastereoisomer.
3 In fischer projection formulae two similar groups are in the same side are called erythro isomer.
4 All chiral molecules should have no element of symmetry.
5 In fischer projection formulae the horizontal bonds are above the plane.

6 Staggered conformation of ethane is less stable than eclipsed conformation.
7 D indicates dextrorotatory L indicates leavorotatory.

Q2 Attempt any 4 **20M**

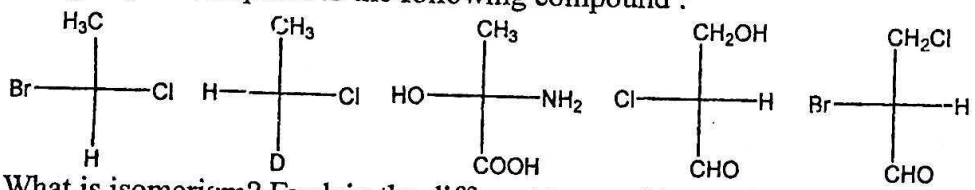
A Explain rate of reaction
B Distinguish between order and molecularity
C Give the examples of second order reactions
D Define the terms 1) Viscosity 2) Surface tension 3) Refractive Index
E How is surface tension measured with the help of stalagmometer.
F Calculate the number of drops formed by an organic liquid having density 0.854 x 103 kg m^{-3} and surface tension 0.051 Nm^{-1}; if water forms 25 drops with the same stalagmometer. Given the density of water 0.998 x 103 kg m^{-3} and its surface tension 0.0728Nm^{-1}.

Q3 Attempt any 4 **20M**

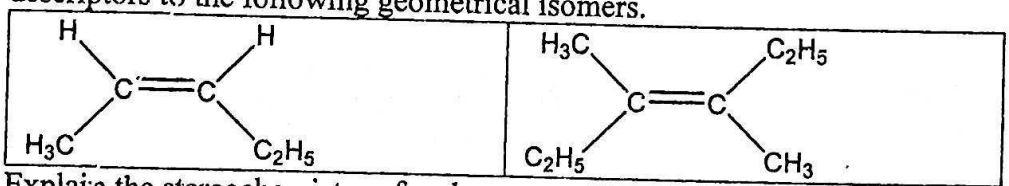
A Distinguish between metallic and non-metallic character of main group elements
B i) Give anomalous behaviour of fluorine **2M**
ii) Discuss the diagonal relationship between Li-Mg **3M**
C Give preparation, properties and uses of sodium bicarbonate and calcium carbonate
D Discuss the characteristics and uses of hydroxides of alkali metals
E Give the sources, health hazards and control measures of NO_x
F Discuss Greenhouse effect.

Q4 Attempt any 4 **20M**

A Draw fischer projection, newman projection and saw horse projection formulae of erythro tartaric acid.
B Assign R,S descreptors to the following compound :



C What is isomerism? Explain the different types of isomerism with examples
D Define enantiorner. Give the characteristics of enantiomer.
E Explain E and Z nomenclature for naming geometrical isomer also assign E Z descriptors to the following geometrical isomers.



F Explain the stereochemistry of carbon compound with two similar carbon atoms.

231106 FS12312

F.Y. B.Sc. SEMESTER – I EXAMINATION: NOVEMBER – 2023

MATHEMATICS PAPER –I: CALCULUS – I

Time: $2\frac{1}{2}$ Hours **Maximum Marks: 75**

NOTE: (1) All questions are compulsory.

(2) Figures to the right indicate full marks.

Qn. (1) Attempt any FOUR questions from the following. $(4 \times 5 = 20\ Marks)$

(a) Show that the multiplicative identity in $\mathbb{R}$ is unique.

(b) Show that $|xy| = |x||y|$ for all $x, y \in \mathbb{R}$.

(c) State and prove the Arithmetic – Geometric mean inequality.

(d) If S is a set bounded below, show that the set S cannot have two infima.

(e) State and prove Archimedean property of real numbers.

Qn. (2) Attempt any FOUR questions from the following. $(4 \times 5 = 20\ Marks)$

(a) Prove that every convergent sequence is bounded.

(b) If $x_n \to p$ then show that $cx_n \to cp$ *where c is a constant.*

(c) Show that a monotone decreasing sequence which is bounded below is convergent.

(d) Show that a sequence $x_n = \frac{1}{n}$ *for all* $n \in \mathbb{N}$ is a Cauchy sequence.

(e) Show that if a sequence converges then it converges to a unique limit.

Qn. (3) Attempt any FOUR questions from the following. $(4 \times 5 = 20\ Marks)$

(a) Solve the differential equation $\frac{dy}{dx}(1 + x^2) + 2xy = 4x^2$

(b) Solve the differential equation $\frac{dy}{dx} + y = xy^3$

(c) Solve the differential equation $(x - 8y)dx - 8xdy = 0$

(d) Solve the differential equation $\left[x + \frac{1}{y}\right]dx - \left[\frac{x}{y^2} - y\right]dy = 0$

(e) Solve the differential equation $[x^2 - 3xy + 2y^2]dx + [3x^2 - 2xy]dy = 0$

Qn. (4) Attempt any <u>THREE</u> questions from the following. ($3 \times 5 = 15$ *Marks*)

(a) Prove: (i) $ab = ac \Rightarrow b = c$

(ii) $ba = ca \Rightarrow b = c \ for \ a \neq 0$

(b) Using Hausdorff property, find the disjoint neighbourhood of $\sqrt{3}$ *and* $\sqrt{7}$.

(c) Show that the sequence $x_n = (-1)^n$ does not converge.

(d) Show that the sequence $x_n = \frac{1}{n+1} + \frac{1}{n+2} + \cdots + \frac{1}{n+n}$ *for all* $n \in \mathbb{N}$ is monotone increasing.

(e) Solve the differential equation $\left[3x^2y + \frac{y}{x}\right]dx + [x^3 + logx]dy = 0$

(f) Find the orthogonal trajectories of the family of curves $y^2 - x^2 = c$

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231106 FS12313

F.Y.B.Sc. (Botany)
Semester-I; Paper-I
(Regular)
[Time: Three Hours] **[Marks: 100]**

N.B:

- **All** questions are compulsory.
- **Figures** to the right indicate full marks.
- Draw **neat and labelled** diagrams wherever necessary.

Q.1 A) Choose the correct option from the following and rewrite the sentence **10 M**

1. Spirogyra reproduces by .....

a) Vegetative means b) Asexual means c) Sexual means d) All of these

2. Alternation of generation in spirogyra is _____

a) haplontic b) diplontic c) haplodiplontic d) diplohaplontic

3. Cells of green algae contain _____ as principal pigment.

a) Chlorophyll a & chlorophyll b b) chlorophyll b & chlorophyll c

c) Chlorophyll b & chlorophyll d d) chlorophyll a & chlorophyll c

4. Nostoc reproduces by _____ methods.

a) Vegetative & asexual b) Vegetative & sexual c) Sexual & asexual d) Vegetative, sexual & asexual

5. Rhizopus belongs to order _____.

a) Mucorales b) Aspergillales c) Erysiphales d) Pucciniales

6. The hyphae of fungi is together called as _____

a) Filament b) Mycelium c) Flagella d) All of these

7. The study of fungi is called _____

a) Mycology b) Phycology c) Bryophyta d) Pteridophytes

8. Cleistothecium is the fruiting body observed in _____.

a) Rhizpous b) Aspergillus c) Mucor d) Agaricus

9. Riccia has _____types of rhizoids.

a) One b) two c) three d) four

10. The main plant body of Riccia is _____

a) Gametophyte b) Sporophyte c) Sporophyte on gametophyte d) None of the above

Q.1 B) Answer in one or two sentences **10 M**

a) Give two example of Algae.

b) Define heterocyst in Nostoc?

c) Define the term Mycology.

d) Which fungi are used as food?

e) Name two types of rhizoids found in Riccia .

Q.2 Answer any two from the following **20 M**

1. Explain in detail Reproduction of *Spirogyra*.
2. Give economic importance of algae in medicine and food.
3. Give the systematic position of *Nostoc*. Add a note on its economic importance.
4. Give detailed account of Lateral and conjugation in spirogyra.

Q.3 Answer any two from the following **20 M**

1. Explain in detail reproduction of Aspergillus .
2. Give economic importance of fungi in detail.
3. Explain the external morphology of Rhizopus
4. Explain the internal morphology of Aspergillus.

Q.4 Answer any two from the following **20 M**

1. Describe the internal structure of Riccia thallus.
2. Write a note on general characters of Hepaticeae.
3. Describe the structure of Sporophyte in Riccia. Add a note on the spore structure.
4. Describe sexual reproduction in Riccia. Add a note on its systematic position.

Q.5 Write short notes on: (any four) **20 M**

1. General character of Nostoc
2. Algae use as a biofertilizer
3. Parasitism in fungi
4. Application of fungi .
5. Vegetative reproduction in *Riccia*
6. Structure of scales and rhizoids in *Riccia*

X-------X-------X

231107 FS12316

FYBSC SEM I MATHS II

Marks: - 75 **Time Duration: - 2 hrs. 30 min.**

NOTE: -

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of calculator is not allowed.

Q.1 Attempt any four. **20**

i. Using principle of finite induction prove that, 8 divides $3^{2n}-1$, $\forall n \in N$.

ii. Prove that $5^{303} \equiv 4\ (mod\ 11)$

iii. If a, b, c, d are the integers such that a | b, b | c then prove that a | c.

iv. Find the GCD of the integers 1350, 1176 and express it as the linear combination of these integers.

v. Prove that $\sqrt{3}$ is not rational.

Q.2 Attempt any four. **20**

i. Prove that, the function $f: \mathbb{R} - \{3\} \to \mathbb{R} - \{7\}$ defined as $f(x) = \frac{7x+1}{x-3}$ is a bijection.

ii. Verify whether the binary operation '.' Defined on $\mathbb{Z}$ as $a.b = \frac{a+b}{5}$, a & b in $\mathbb{Q}$, is commutative or associative.

iii. Verify whether the binary relation defined on the set of integers $\mathbb{Z}$ as aRb if and only if $2a + b$ is divisible by 3, a & b in $\mathbb{Z}$.

iv. If $f: X \to Y$ and $g: X \to Y$ are two functions, prove that f and g are surjective implies that gof is also surjective.

v. If f: X → Y is a function and A and B are two non-empty subsets of X and Y respectively prove that $f(f^{-1}(B)) \subseteq B$, the equality holds if and only if f is surjective.

Q.3 Attempt any four. **20**

i. Find the roots of the polynomial $x^3 - 2x^2 - x + 2$, if the sum of two of it's two roots is zero.

ii. If r_1, r_2, r_3 are the roots of polynomial $x^3 + x^2 - 3x + 1 = 0$ without calculating r_1, r_2, r_3, find the polynomial whose roots are $2r_1, 2r_2, 2r_3$.

iii. State and prove rational root theorem.

iv. Prove that, the only unit polynomials in R[x] are non-zero constant polynomials.

v. Find all cube roots of Unity.

Q.4 Attempt any three. **15**

i. If $a \equiv b \pmod n$ and $c \equiv d \pmod n$ then prove that

a) $a + c \equiv b + d \pmod n$

b) $ac \equiv bd \pmod n$

ii. Prove that, the number of primes is infinite.

iii. Verify whether the binary operation '.' Defined on $\mathbb{Z}$ as $a.b = 4a - 5b$, a & b in $\mathbb{Z}$, is commutative or associative.

iv. Verify whether the binary relation defined on the set of integers $\mathbb{R}$ as aRb if and only if $a = -b$, a & b in $\mathbb{Z}$.

v. If p(x) is an irreducible polynomial in R[x] such that p(x) |a(x).b(x) where a(x) and b(x) are polynomials in R[x] then prove that, p(x) |a(x) or p(x) |b(x).

vi. Find the g.c.d of the polynomials $x^8 - 1$, $x^{12} - 1$

Set · III

231107

F-S12317

Semester – I. Botany: Paper II 3 Hours Marks: 100

N.B.: All questions are compulsory
Figures to the right indicate full marks
Draw neat and labeled diagrams whenever necessary

Q.1.A. Choose the correct option from the following and rewrite the sentence 10

1. The upright energy flow model was a suggested by_____.
a) Lindeman b) E.P.Odum c) Earnst Haeckal d) Kozlowski

2. Which of the following is largest ecosystem?
a) lake b) wetland c) Forest d) Ocean

3. Boreal coniferous forest found in the region like_____
a) Western ghats b) Southern France c) great Britain d) Finland

4. Mendal performed experiment on_____plant.
a) Pea b) sunflower c) Nostoc d) All of them

5. The ratio obtained in test cross is_____.
a) 1:1 b) 3:1 c) 2:1 d) 1:2

6. Terrestrial ecosystem does not include.
a) cold desert b) temperate rainforest. c) estuarine d) Both a & b

7. Protoplast of every cell is surrounded by a living membrane called_____.
a) plasma membrane b) cell wall c) middle lamella d) endoplasmic reticulum

8. The green plastid present in all green plants are_____.
a) mitochondria b) chloroplast c) lucoplast d) Golgi bodies

9. Which of the following is not a function of endoplasmic reticulum
a) Protein synthesis b) synthesis of glycogen
c) provide mechanical support d) trap light energy

10. Biological community interacting with nonliving environment is called an_____.
a) food chain b) ecosystem c) ecology d) food web

10

Q.1.B. Answer the following in one sentence.

1. Phenotype
2. Variation
3. Ecology.
4. 1st law of thermodynamics
5. Eukaryotic cell.

20

Q.2. Answer ant two of the following.

1. State the law of independent assortment. Explain the Dihybrid cross by using suitable example.
2. Distinguish between, epistasis and non epistasis gene interaction.
3. Explain in brief desert ecosystem
4. Distinguish between aquatic and terrestrial ecosystem.

20

Q.3. Answer any two of the following.

1. Explain the fluid mosaic model of plasma membrane with neat labeled diagram.
2. Discuss the specialization and functions of plasma membrane.
3. What is energy pyramid? Explain how energy flows through the ecosystem.
4. By giving suitable example describe monohybrid cross.

20

Q.4. Answer any two of the following.

1) Give reasons for Mendel success and state the law of segregation of gametes
2. What are the types of forest ecosystem? Explain any four types.
3 Explain in detail role of endoplasmic reticulum in protein synthesis.
4. What is multiple allele? Explain one example of multiple allele

20

Q.5. Write short notes on any four.

1. Co-dominance
2. Incomplete dominance
3. Wetland
4. River ecosystem.
5. Grassland ecosystem.
6. Prokaryotic cell.

231108 FS12320

RIZVI COLLEGE OF ARTS, SC. & COM.
F.Y.B.Sc. (PHYSICS) SEM –I (Revised Syllabus)
REGULAR - October 2023
PAPER-I

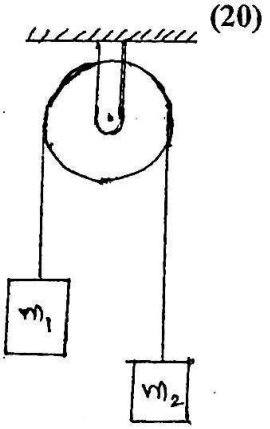
Time: 2 Hr 30 min. **Max. Mark: 75**

NOTE:

1. All questions are **compulsory.**
2. Figures to the right indicate full marks.
3. Use of non-programmable scientific calculator is allowed.

Q.1 A) Attempt any TWO of the following. **(20)**

1) Two unequal masses m_1 and m_2 connected by light and an inextensible string of negligible mass are hung vertically over light and frictionless pulley as shown in the figure. If $m_1 > m_2$, determine the acceleration of Two masses and the tension in the string.



2) Two bodies of masses m_1 and m_2 are connected by a light string going over a smooth light pulley at the end of an incline. The mass m_1 lies on the incline that makes an angle θ with the horizontal and the mass m_2 hangs vertically. The system is at rest. Find the angle of the incline and the force exerted by the incline on the body of mass m_1.

3) Define and explain angle of friction λ and angle of repose α. Hence show that the angle of friction λ and angle of repose α are same.

4) Sate and prove work-energy theorem.

Q.2 A) Attempt any TWO of the following. **(20)**

1) State Stoke's law and obtain the expression for Stoke's law using dimensional analysis.

2) Define the term Young's modulus Y, Bulk modulu's k and Poisson's ratio σ. Show that for a homogeneous isotropic materials, the Young's modulus Y is given by

$$Y = 3k(1 - 2\sigma)$$

3) State and prove Bernoulli's theorem for a liquid flowing along a streamline.

4) What is critical velocity? Show that the critical velocity obtained by Reynold using dimensional analysis is given by

$$V_c = \frac{K\eta}{\rho D}$$

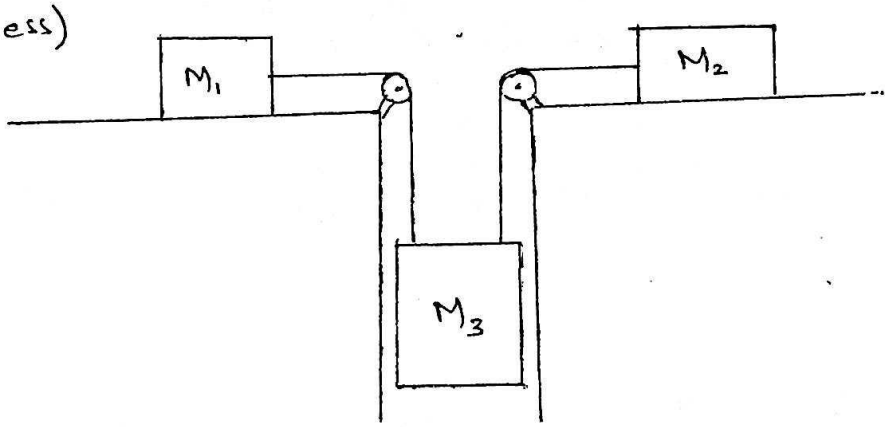
where the symbols have their usual meanings.

Q.3 A) Attempt any TWO of the following. (20)

1) Discuss the concept of internal energy and obtain first law of thermodynamics.
2) Obtain an expression for the work done during isothermal change.
3) Derive the Van der Waals equation.
4) Certain quantity of a perfect gas at NTP is compressed adiabatically to half of its original volume. Calculate the resulting pressure and temperature ($\gamma = 1 \cdot 4$).

Q.4 A) Attempt any THREE of the following. (15)

1) In the figure shown below, find the acceleration of the bodies and the tension in the figures. Given $M_1 = 4kg, M_2 = 8kg$ & $M_3 = 16kg$. (Assume surfaces are frictionless)



2) The length of the wire increases from 1.25m to 1.2508m when a load of 12kg is suspended. The radius of the wire is 0.5mm. Calculate stress and strain.
3) Define the followings
   i) Steady flow
   ii) Irrotational flow
   iii) Incompressible flow
   iv) Non-viscous flow
4) The force on a particle of mass 10gm is $(10\vec{\imath} + 5\vec{\jmath})N$. If it starts from rest, what would be its position at time $t = 5s$?
5) Explain the terms 1) Isothermal process 2) Adiabatic Process 3) Isochoric process.
6) Find the efficiency of Carnot's engine working between 373°C and 100°C.

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231108 FS12321

FYBSc. ZOOLOGY SEMESTER I PAPER I (Course I)

Time : 3 Hrs **Total Marks : 100**

N.B :
1. **All questions are compulsory**
2. **All questions carry equal marks**
3. **Draw neat and labelled diagram wherever necessary**

Q.1 A) Fill in the blanks by choosing the correct options given below. **05**

a. Mollies and Guppies are _____.
(Ovoviviparaous, Viviparous, Oviparous)
b. Phrynosoma is a _____.
(Aves, Amphibia, Reptile)
c. Ghana Bird sanctuary is located in_____.
(Rajasthan, West Bengal, Gujarat)
d. Dr. Hargobind Khorana and his colleagues discovered _____.
(RNA transcription, Genetic code, Genetic material)
e. _____ is the largest biotech company in India.
(D'HARA, AMUL, BIOCON)

Q.1B) Match the columns I and II and rewrite **05**

Column I	Column II
a) Firefly	1) Social and cultural value
b) Opium poppy	2) Baba Amte
c) Cobra	3) Surimi
d) Lok Biradari Prakalp	4) Pain reliever
e) Gadre Fisheries	5) Lampyridae

Q.1 C) State whether the given statement is true or false. **05**

a. Bats communicates by echolocation.
b. Round pearls are produced by phytogenic granules.
c. Andaman and Nicobar are a part of Indo – Burma hotspot.
d. Schedule V provide total protection to animals.
e. Anna Hazare received the Jit gill Memorial award.

Q.1 D) Answer the following in one sentence. **05**

a. Define Autotomy.
b. What is Batesian mimicry?
c. Give Full form of CITES.
d. Define *In – situ* conservation.
e. What is the title of Dr. Salim Ali's autobiography?

Q.2 A) Describe the process of pearl formation. **10**

OR

A) Describe the bioluminescence in animals. **10**

Q.2 B) Explain any two from the following.

a. Echolocation in bats.

b. Mechanism of coral formation.

c. Advantages and disadvantages of migration.

d. Parental care in Pisces. **10**

Q.3 A) Explain biodiversity hotspots. **10**

OR

A) Describe in detail Ex- Situ conservation methods. **10**

Q.3 B) Explain any two from the following.

a. Significance of biodiversity.

b. Genetic diversity.

c. Habitat loss.

d. Indian Wildlife (Protection) Act, 1972 **20**

Q.4 Answer any two from the following.

a. What is White Revolution? State the contribution of Dr. Varghese Kurian towards it.

b. Give a detailed note on the life sketch of Anna Hazare.

c. Describe the life sketch of Rajendra Singh.

d. Describe the Role of Kiran Mazumdar Shaw in developing BIOCON. **20**

Q.5 Write short notes on any four.

a. Regeneration in Earthworm.

b. Parental care in Platypus.

c. Indirect use value of biodiversity.

d. Biosphere reserve.

e. Work done by Dr. Hargobind Khorana.

f. Awards won by Baba Amte

231109 FS12324

RIZVI COLLEGE OF ARTS, SC. & COM.
F.Y.B.Sc. (PHYSICS) SEM –I (Revised Syllabus)
REGULAR - September/October 2023
PAPER-II , SET-II

Time: 2 Hr 30 min. **Max. Mark: 75**

NOTE:

1. All questions are **compulsory.**
2. All questions carry equal marks.
3. Figures to the right indicate full marks.
4. Use of non-programmable scientific calculator is allowed.

Q.1 Attempt any TWO of the following. (20)

1. Derive a relation to find the nuclear size on the basis of Rutherford's experiment.
2. With the help of a SEGZE- chart, explain the stability of nucleus.
3. Show that the mean life of a radioactive material is reciprocal of it's decay constant.
4. Explain the law of successive disintegration with the help of a suitable graph.

Q.2 Attempt any Two of the following. (20)

1. Describe in detail the construction and working of GM counter.
2. Explain the construction and working of proportional counter.
3. Derive an expression of the Q-value of nuclear reaction.
4. What are the types of Nuclear reactions, explain in brief.

Q. 3 Attempt any two of the following. (20)

1. Describe Laue's experiment on X-ray diffraction. What is the significance of the experiment.
2. Discuss continuous and characteristic X-ray spectra. Obtain an expression for Duane and Hunt's law.
3. Explain the concept of dual nature of matter and set up an expression for the wavelength of matter waves in terms of (i) particle momentum and (ii) energy.
4. Derive an expression for the shift in wavelength in Compton effect. What will happen if electron bound to atom with large binding energy?

Q.4. Attempt any THREE of the following. (15)

1. Radioactive substance decays to 1% of it's ogiginal amount in 30 years. Find the half-life Period of a substance.
2. Find the a) radius of a nucleus b) volume c) mass of a Copper nucleus. [A= 63. R_0 = 1.4 fm }
3. Write a short note on current Ionisation (Integrated type) chamber.
4. If two deuterium nuclei fused to form a alpha particle then what amount of energy is released in this process? Given mass of deuterium = 2.014102 amu, alpha particle = 4.002603 amu.

5. Calculate the value of least and maximum values of wavelength obtained when gamma rays of energy 0.5 MeV are scattered by matter.

6. If the critical voltage for the emission of K line from copper is 9000 V and the wavelength of K absorption edge is 1.377 A^0 , calculate the ratio of h/e?

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231109 FS12325

FYBSc. ZOOLOGY SEMESTER I PAPER II (COURSE II)

Time : 3 Hrs **Total Marks : 100**

N.B :
1. **All questions are compulsory**
2. **All questions carry equal marks**
3. **Draw neat and labelled diagram wherever necessary**

Q.1 A) Fill in the blanks by choosing the correct options given below. **05**

a. Flash point of flammable liquid is less than_____.
(32.5^0C,37.8^0C,70^0C)
b. _____ is a technique where subject selected from original sample with a specific purpose.
(judgmental sampling, quota sampling, snowball sampling)
c. The term Biotechnology was coined by a Hungarian agriculture engineer _____
(Theodor schwann ,Karl Ereky, Ian wilmut)
d. _____ is used to determine the amount of analyte present in sample.
(microscope, colorimeter, centrifuge)
e. Low speed centrifuge are also called as_____.
(basic centrifuge, clinical centrifuge, ultra centrifuge)

Q.1B) Match the columns I and II and rewrite **05**

Column I	Column II
a) Hydrogen cyanide	1) GLP certification
b) NGCMA	2) Combine glass electrode
c) DNA Fingerprinting	3) Toxic
d) pH meter	4) light reflection
e) Microscope	5) VNTRs

Q.1 C) State whether the given statement is true or false. **05**

a. One nanometer is equal to $1x10^{-6}$ meter.
b. Any definite set of objects selected from population is called as sample.
c. Cloned sheep had its genetic composition exactly like that of the parent from whom the enucleated ovum was derived.
d. Electrophoresis gel must be hydrophilic
e. Wavelength is number of oscillation occur per second

Q.1 D) Answer the following in one sentence. **05**

a. Define data
b. Give formula to find arithmetic mean
c. What is biotechnology
d. Give formula for retardation factor
e. Define Gas-Liquid chromatography

Q.2 A) Explain how you will determine the median for grouped and ungrouped data using a suitable example. **10**

OR

A) Discuss Good Laboratory Practices (GLP) and the steps required to obtain a GLP certificate in India.

Q.2 B) Explain any two from the following. **10**

a. Toxic chemicals with its safety symbol

b. Metric system

c. Normality

d. Simple random sampling

Q.3 A) Explain cloning with respect to Dolly sheep. **10**

OR

A) Explain the scope and applications of medical biotechnology.

Q.3 B) Explain any two from the following. **10**

a. Recombinant DNA in medicine

b. Enlist applications of DNA Fingerprinting

c. Retroviral vector method

d. Ex vivo gene therapy

Q.4) Explain any two from the following. **20**

a. Construction and principle of a compound microscope.

b. Principle and applications of colorimeter

c. Principle and applications of spectrophotometer

d. Centrifuge and its type

Q.5 Write short notes on any four. **20**

a. Safe laboratory measure to be adopted by students

b. Pie diagram

c. SCID

d. Transgenic fish

e. Sorensen's pH scale

f. Paper chromatography