

Max Marks : 50

Time : 2 ¼ hours

General Instructions.

- 1) Section A : Q.No. 1 contains 7 multiple choice questions carrying one mark each.
Q.No. 2 contains very short answer type of questions carrying one mark each.
- 2) Section B : Q.No. 3 to Q.No. 13 contain eleven short answer type of questions carrying two marks each.
- 3) Section C : Q.No. 14 to Q.No. 19 contains six short answer type of questions carrying three marks each.
- 4) Section D : Q.No. 20 to Q.No. 23 contains four long answer type of questions carrying four marks each.
- 5) Use of Log Tables is allowed.
- 6) Figures to the right indicate full marks.

Given, $h = 6.63 \times 10^{-34}$ Js $c = 3 \times 10^8$ m/sSection A

Q.1. Select and write the correct answer:

(07)

1. What is the SI unit of angular velocity?
a) m/s b) m^2/s^2 c) rad/s d) rad/s^2
2. The gravitational potential due to the earth is minimum at?
a) its centre b) its surface
c) a distance equal to 10 times the radius of the Earth d) infinite distance
3. The total energy of a particle executing SHM is proportional to?
a) the frequency of oscillations b) the square of the amplitude of motion
c) the velocity at the equilibrium position d) the displacement from the equilibrium position
4. The phase difference between the particle velocity and wave velocity in a transverse wave is?
a) zero b) $\pi/2$ rad c) $\pi/4$ rad d) π rad.
5. An instrument which can measure terminal potential difference as well as electro motive force (emf) is?
a) Wheatstone's meter bridge b) voltmeter
c) potentiometer d) galvanometer
6. The photoelectric threshold wavelength of a certain metal is 3315 \AA . Its work function is?
a) $6 \times 10^{-19} \text{ J}$ b) $7.286 \times 10^{-19} \text{ J}$ c) $9 \times 10^{-19} \text{ J}$ d) $9.945 \times 10^{-19} \text{ J}$
7. In twenty minutes, the angular displacement of the minute hand of a wrist watch is?
a) $\pi/90$ rad b) $\pi/30$ rad c) $\pi/3$ rad d) $2\pi/3$ rad

Q.2. Answer the following:

(07)

1. Eddy currents are also called as?
2. The dimensions of universal gravitational constant G is?
3. State the expression for the total energy of SHM.
4. Define wave motion.
5. The energy of a photon of wavelength λ is?

- a) $hc\lambda$ b) $h\lambda/c$ c) λ/hc d) hc/λ

6. A wire with a resistance R is stretched to 1.25 times its original length, volume remaining constant. The resistance of the wire after it is stretched is about?

- a) 1.44 R b) 1.56 R c) 2.25 R d) 2.56 R

7. The binding energy of a satellite revolving around a planet in a circular orbit is $3 \times 10^9 \text{ J}$. Its kinetic energy is?

Section B

Attempt any EIGHT :

(16)

Q.3. Obtain the relation between linear velocity and angular velocity.

Q.4. Derive an expression for the maximum velocity of a particle performing SHM.

Q.5. State any four applications of a communication satellite.

Q.6. State the principle of superposition of waves.

Q.7. Explain the principle of a potentiometer.

Q.8. State any four characteristics of photoelectric effect.

Q.9. State Faraday's law of electromagnetic induction.

Q.10. The energy required to remove electron from sodium is 2.3 eV. Does sodium show photoelectric effect for orange light of wavelength 6800 Å?

Q.11. Four resistances 4, 4, 4 and 12 Ω form a Wheatstone's network. Find the resistance which when connected across the 12 Ω resistance will balance the network.

Q.12. The equation of a transverse wave along a stretched string is

$$y = 2 \sin 2\pi \left[\frac{t}{0.05} - \frac{x}{0.007} \right]$$

in SI system. Calculate its a) wavelength b) frequency.

Q.13. A particle performing linear S.H.M has maximum velocity of 20 m/s and maximum acceleration of 80 cm/s^2 . Find the amplitude.

Section C

Attempt any FOUR:

(12)

Q.14. State Kepler's law of planetary motion.

Q.15. Define centripetal force. Give two examples.

Q.16. Obtain expression for ^{Total} kinetic energy of a particle performing linear SHM.

Q.17. Two sound waves having wavelength of 87 cm and 88.5 cm respectively, when superimposed, produce 10 beats per second. Find the velocity of sound.

Q.18. A potentiometer wire has a length of 2m and resistance 10 Ω . It is connected in series with resistance 990 Ω and a cell of e.m.f 2V. Calculate the potential gradient along the wire.

Q.19. The work function of tungsten is 4.50 eV. Calculate the speed of fastest electron ejected from tungsten surface when light whose photon energy is 5.80 eV shines on the surface.

Section D

Attempt any TWO:

(08)

Q.20. How will you distinguish between polarized and non polarized light?

(2)

Explain the construction of spherical wavefront with diagram.

(2)

Q.21. Explain the concept of self induction, hence define the coefficient of self induction.

(2)

A current is changing at the rate of 5 A/s in one coil, induces an e.m.f of 4V in the neighboring coil. Calculate the coefficient of mutual inductance between the coils.

(2)

Q.22. Obtain the expression for the period of a conical pendulum.

(2)

- a) $hc\lambda$ b) $h\lambda/c$ c) λ/hc d) hc/λ

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(2)

Q.22. Obtain the expression for the period of a conical pendulum.

(2)

A stone weighing 1 kg is whirled in a vertical circle attached at the end of a rope of length 0.5m. Find the tension at 1) Lowest position 2) Highest position. (2)

Q.23. Derive an expression for the critical velocity of a satellite. (2)

The period of oscillation of simple pendulum increases by 20% when its length is increased by 44cm. Find its initial length (2)

- 1) Use of log table is allowed,
- 2) Given data,
- Avogadro's Number = 6.023×10^{23} , Gas constant value 'R' = $8.314 \text{ JK}^{-1} \text{ mol}^{-1}$
(Atomic wt. C = 12 , H = 1 , N = 14 & O = 16)

Section – A

- Q:1) Select and write the correct alternative for each of the following. (1M each)
- i) The rate of reaction is expressed in unit a) mol s^{-1} b) $\text{mol}^{-1} \text{ dm}^{-3} \text{ t}^{-1}$ c) $\text{mol dm}^{-3} \text{ t}^{-1}$ d) time^{-1}
 - ii) P, P'- dichloro diphenyl trichloroethane is used as
d) An antiseptic b) an Insecticide c) an Analgesic d) An refrigerant
 - iii) A compound crystallizes in FCC type structure with 'A' ions at the centre of each face and 'B' ions occupying corners of the Cube , the formula of the compound is , -----
d) A_3B b) AB_3 c) A_3B_2 d) A_2B_3
 - iv) A solution of NaOH (Mol. Wt. = 40) was prepared by dissolving 16g of NaOH in 2 litre of solution. The Molarity of the solution is -----
a) 2 M b) 0.2 M c) 0.02 M d) 20 M
 - v) The major binding force in graphite,
a) ionic bond b) covalent bond c) Hydrogen bond d) Van-der waal's force .
 - vi) The correct order of C—X bond strength in $\text{CH}_3\text{—X}$ is -----
a) $\text{CH}_3\text{—F} > \text{CH}_3\text{—Cl} > \text{CH}_3\text{—Br} > \text{CH}_3\text{—I}$ c) $\text{CH}_3\text{—F} > \text{CH}_3\text{—Br} > \text{CH}_3\text{—I} > \text{CH}_3\text{—Cl}$
b) $\text{CH}_3\text{—I} > \text{CH}_3\text{—Br} > \text{CH}_3\text{—Cl} > \text{CH}_3\text{—F}$ d) $\text{CH}_3\text{—Cl} > \text{CH}_3\text{—Br} > \text{CH}_3\text{—I} > \text{CH}_3\text{—F}$
 - vii) Lucas reagent is ---- a) Na-Hg / H_2O b) Zn - Hg / H_2O c) anhyd. Zn /Conc.HCl d) Zn—Hg /HCl

- Q:2) Answer the following , (1M each)
- i) The IUPAC name of the complex is $[\text{Fe}(\text{CN})_6]^{3-}$ is -----
 - ii) _____ is used to convert carboxylic acid and esters into primary alcohol.
 - iii) The compound used to decaffeinate tea and coffee is _____
 - iv) _____ has two or more donor atoms , but in a complex only one donor atom is attached at a time to metal .
 - v) If the value of radius ratio r^+ / r^- is 0.225 to 0.414 then the type of whole is _____ and its co-ordination number is. _____
 - vi) _____ is the ratio of number of moles of solute dissolved in 1Kg of solvent.
 - vii) Write rate expression for the reaction $\text{F}_2(\text{g}) + 2\text{ClO}_2(\text{g}) \rightleftharpoons 2\text{FCLO}_2(\text{g})$ in terms of rate consumption of reactant.

SECTION – B

(Attempt any eight)

(2M Each)

- Q:3) State effective atomic number (EAN) . Find EAN of the central metal atom in, $[\text{Zn}(\text{NH}_3)_4]^{+2}$
- Q:4) Explain Markownikoff's rule with one suitable example.
- Q:5) What are phenols ? What is the action of conc. HNO_3 on phenol ?
- Q:6) what is the action of conc. H_2SO_4 at different temperature on
a) Ethyl alcohol. b) sec.propyl alcohol.

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- Q:7) Define, a) Molecularity of a reaction. (b) What is anisotropy.
- Q:8) Define elevation of boiling point. Write equation that gives relation between depression of freezing point and Molar mass of solute.
- Q:9) How is Phenol prepared from Aniline ?
- Q: 10) Explain optical activity of Lactic acid.
- Q:11) State and explain Kohlrausch law of independent migration of ions.
- Q: 12) What is pseudo – first order reaction ? Give one example.
- Q: 13) How is ethanol prepared from ethane?

SECTION – C

(Attempt any Four)

(3M Each)

- Q:14) a) Define Molar conductivity. Write its S.I. unit.
b) The distance between two electrodes of a conductivity cell is 0.98cm and area of cross section of the electrode is 1.3 cm^2 . Calculate the cell constant for the cell.
- Q:15) The conductivity of 0.005M NaI solution at 25°C is $6.065 \times 10^{-4} \Omega^{-1} \text{ cm}^{-1}$. Calculate its molar Conductivity ?
- Q:16) What is Grignard reagent? How it is prepared ?
Give reaction of conversion of methyl bromide into ethane.
- Q: 17) a) Write characteristics of complexion. Give structure of Sodium dicyanoaurate (I) Compound.
- Q:18) Define Zero order reaction. Derive integrated rate law for first order reaction
'A' \rightarrow product.
- Q:19) Give mechanism of intermolecular dehydration of ethyl alcohol into ethane.
- Q:20) State Raoult's law, and obtain expression for lowering of vapour pressure when non-volatile Solute is dissolved.

SECTION – D

(Attempt Any Two)

(4M Each)

- Q:21) a) What are alkyl halide ? What is the action of PCl_3 on ethyl alcohol ?
b) Distinguish between SN^1 and SN^2 reaction mechanism.
- Q:22) a) How will you prepare,
(i) 1- Bromopropane from propene. (ii) Ethyl bromide from ethanol.
b) Explain or give reason why ethyl alcohol is having higher boiling point than ethane.
c) i) haemoglobin is a complex of _____
ii) Chlorophyll is a complex of _____
- Q:23) a) Calculate the packing efficiency for BCC structure
b) What is the action of,
i) SOCl_2 on ethyl alcohol. ii) Conc. HNO_3 on Phenol ?
- Q:24) (i) Define ebullioscopic constant.
ii) 0.15 molal solution of a substance boils at 373.23K. Calculate molal elevation constant of water. (Given boiling of water = 373.15K)
iii) Calculate the osmotic pressure of 4.5g of glucose (Molar mass = 180 gmol^{-1}) dissolved in 100ml of water at 298 K. ($R = 0.0821 \text{ lit atmK}^{-1} \text{ mol}^{-1}$).

XXXX

XXXX

END.

First term exam 2019

Class: SYJC (science)

M.M: 50

Subject: Maths.

Time: 2 1/2 hours

Section A

Q.(1) Select and write the correct answer.[10]

(1) The principal solution of $\cos \theta = 1/2$ is,

(a) $\pi/3$ and $5\pi/3$, (b) $\pi/2$ and $4\pi/3$, (c) $2\pi/3$ and $5\pi/2$ (d) $\pi/3$ and $4\pi/3$

(2) The negation of the statement $(p \wedge q) \rightarrow (\sim p \vee q)$ is

(a) $p \wedge q \wedge \sim r$, (b) $p \vee q \wedge \sim r$, (c) $p \wedge q \vee \sim r$, (d) $p \vee q \vee \sim r$

(3) $f(x)$ is continuous at $x = 0$ where $f(x) = \frac{\sin 3x}{x}$, $x = 0$ then $x = \dots$

(a) 1. (b) -1. (c) 3. (d) -3

(4) If $y = \sin(\cos 3x)$ then dy/dx is

(a) -3. (b) 3. (c) $1/3$. (d) $-1/3$

(5) If $x = at^2$, $y = 2at$, then dy/dx is

(a) $1/t$, (b) t , (c) t^2 , (d) 1

Q.(2) Answer the following.[4]

(1) write the dual of the statement pattern, Ravi or Avinash went to Chennai.

(2) Find general solution of $\cos \theta = 1$.

(3) Differentiate $\cos(\log x)$ w.r.to x .

(4) Find $f(0)$, if $f(x)$ is continuous at $x = 0$ where $f(x) = \sin x - \cos x$, $x = 0$.

Section B

Attempt any eight of the following.[16]

Q.(3) If p, q, r are statement with truth value T, F, T respectively. Find truth value of $q \rightarrow (p \vee \sim r)$.

Q.(4) Solve the equations $x + 2y = 2$, $3x + 5y = 4$, by reduction method.

Q.(5) In ΔABC prove that $\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c} = \frac{a^2 + b^2 + c^2}{2abc}$

Q.(6) Find dy/dx , if $\sqrt{x} + \sqrt{y} = a$.

Q.(7) Find the approximate value of $\sqrt{8.95}$

Q.(8) A particle moves according to the law $S = t^3 - t^2 + 9t + 15$. Find velocity when $x = 0$.

Q.(9) Find the equation of tangent to the curve $x^2 + y^2 + dy = 3$ at $(1,1)$.

Q.(10) Find k if function is a p.m.f

$$P(x) = kx, x = 1,2,3.$$

$$= 0, \text{ otherwise.}$$

Q.(11) Using vector method, Find k if points $(3, -1)$, $(0, -3)$ and $(12, 5)$ are collinear.

Section C

Attempt any four of the following [12]

Q.(12) Using truth table prove that $p \leftrightarrow q = (p \wedge q) \vee (\sim p \wedge \sim q)$.

Q.(13) Find the inverse of the matrix by adjoint method.

$$\begin{bmatrix} 1 & 0 & 0 \\ 3 & 3 & 0 \\ 5 & 2 & -1 \end{bmatrix}$$

Q.(14) In ΔABC with usual notations, prove that, $a(b \cos C - c \cos B) = b^2 - c^2$.

Q.(15) If $f(x)$ is a continuous function at $x=0$ where

$$f(x) = x + 1 - b, \text{ for } x < 0$$

$$= 1, \text{ for } x = 0$$

$$= \frac{\sin 2x}{x} + a, \text{ for } x > 0. \text{ Find } a \text{ and } b.$$

Q.(16) ~~Three~~ ³ coins are tossed, if random variable X denotes number of heads. Obtain the probability distribution of X .

Section D

Attempt any two of the following [8]

Q. (17) If A and B are two points having position vectors a and b , a point C divides segment AB in the ratio $m:n$ internally then prove that, $\vec{c} = \frac{mb + na}{m+n}$ where \vec{c} is position vector of C .

Q.(18) Verify the Roll's theorem for the function $f(x) = x^2 - 4x + 10$ on $[0, 4]$.

Q.(19) If $ax^2 + 2hxy + by^2 = 0$ then show that $d^2y/dx^2 = 0$.

**I TERM EXAMINATION - 2019
SUB - BIOLOGY**

STD. XII

MARKS - 50

SUB - BIOLOGY

TIME - 2HRS

General instructions

1. All questions are compulsory.
2. Section A contain Q1 of multiple choice type of questions carrying one mark each. Q2 of very short answer type of questions carrying one mark each.
3. Section B contain Q3 to Q13 of short answer type of questions carrying two marks each.
4. Section C contain Q14 to Q19 of short answer type question carrying three mark each.
5. Section D contain Q20 to Q23 of long answer type question carrying four mark each.

Section A

Q.No.1 Select and write the correct answer.

(07)

- i. _____ is the branch of biology that deals with heredity and variation.
a) Genetics b) Cistron c) muton d) recon
- ii. _____ is the triplet of nucleotides present on the anticodon loop of t-RNA which is complementary to the codon of rn-RNA.
a) Codogen b) codon c) Anticodon d) sense codon
- iii. Which of the following shows chloroplast dimorphism? _____
a) Sugar cane b) Sugar beet c) potato d) Papaya
- iv. Each molecule of NADH₂ through ETS yields. _____
a) 1 ATP b) 2.ATPs c) 3ATPs d) 4ATPs
- v. Colorblindness is a _____.
a) Deficiency disease b) X-Linked disease c) Y-linked disease d) XY- linked disease.
- vi. In early days, insulin was extracted from _____.
a) Liver of pigs b) pancreas of pigs c) pancreas of pigs and cattle d) liver of horse
- vii. Typhoid is caused by _____.
a) Salmonella b) Ascaris c) fugus d) Entamoeba

Q.No.2 Answer the following.

(07)

- i. Name the plasma protein which initiates blood coagulation.
- ii. Name the secretion of sebaceous gland.
- iii. Give the function of ureter.
- iv. Define Monohybrid cross.
- v. What is the distance between two poly nucleotide chains of DNA?
- vi. What is Plastidome?

vii. What is the RQ i.e. Respiratory Quotient of carbohydrate.

Section B

Answer the following. (Any 8)

(16)

Q3. You are conducting an artificial hybridization on Pea and Papaya. Which one of them needs emasculation? Why?

Q4. Give the chemical component of Nucleic Acid (DNA).

Q5. Explain Griffith Experiments.

Q6. Give the scientific name of malarial parasite that causes malignant (severe) malaria. Which human organ and blood cells are infected by parasite in its life cycle?

Q7. Give the significance of respiration.

Q8. Give the causes of Deforestation.

Q9. Give the scientific and commercial value of transgenic animals.

Q10. Describe the types of chromosomes according to position of the centromere.

Q11. Distinguish between artery and vein.

Q12. In C4 plants, Photorespiration is avoided. Give reason.

Q13. Sketch and label ultra-structure of mitochondria.

Section C

Answer the following. (Any 4)

(12 M)

Q14. Define Dihybrid Cross. Explain Dihybrid cross with the help of chart.

Q15. Explain mechanism of H.S.K pathway with chart.

Q16. Describe "Terminal oxidation".

Q17. Explain the regulation of kidney function.

Q18. Explain the different types of WBC's.

Q19. Describe the V.S of kidney and name the hormone secreted by kidney.

Section D

Answer the following. (Any 2)

(8M)

Q20. i) Why does the left ventricle has thicker wall than the right ventricle?

ii) Why there is no mixing of oxygenated and deoxygenated blood in mammalian heart?

iii) Why human heart is called myogenic?

Q21. Describe the development of female gametophyte with the help of neat labeled diagram.

Q22. Explain the Replication of DNA with neat labeled diagram.

Q23. Fill in the blanks with appropriate answer.

Sr. No.	Pollinating agents	Type of Pollination
1.	Honey bee	
2.	Bat	
3.	Wind	
4.	Water	

- NOTE: 1. All questions are compulsory.
 2. Draw neat diagrams wherever necessary.
 3. Figures to the right indicate full marks
 4. Use of any type of calculator is not allowed
 5. Due credit will be given for the programs with appropriate comments
 6. Write both the papers in the same answer sheet

Paper I

Q.1. Answer any two of the following: 10

- a. Explain the following OOP concepts with an example of each:
 (i) Inheritance (ii) Polymorphism (iii) Data Abstraction
- b. Explain <A> and <big> tags with suitable Example
- c. Write a Short note on Segmentation.

Q. 2. Answer any one of the following: 5

- a. Write a short note on Operating System. Explain LINUX.
- b. Explain the difference between Worm and Virus.

Q. 3. Answer any two of the following: 10

- a. Write a program in C++ to replace the blank spaces in the string with an hyphen (-).
- b. Write a program in C++ to check whether the entered number is a Palindrome or not.
- c. Write a note on Constructor and Destructor. Explain with Examples

OR

Q. 3. Answer any two of the following: 10

- d. Write a program in C++ to swap two numbers inputted by the user using swap function.
- e. Explain how you will create ordered lists and unordered lists in HTML with examples.
- f. Write the HTML code for the following output.

		Year		
		1998	1999	2000
Sales	Units	500	400	1000
	Income	1000	800	2000

Q.1) Fill in the blank [10 M]

- 1) _____ tag is used to create textbox.
- 2) In Inline css style is used as an _____.
- 3) Video file can be added in a web page using _____ tag with control.
- 4) To limit content in text box _____ attribute is used.
- 5) Cords is an attribute of _____ tag.
- 6) In css to put a line above the text _____ property is used.
- 7) In Ecommerce product attributes are selected by _____.
- 8) IIS stands for _____.
- 9) For image mapping _____ types of images are used.
- 10) _____ is a paperless exchange of information.

Q.2) State true or false [10 M]

- 1) Addres see is the person who sends the message.
- 2) To give coordinate in active area of image map cords attribute is used.
- 3) Trade cycle is a series of exchange between consumer and business.
- 4) Using pirated software is ethical.
- 5) Ecommerce is an old method of doing business.
- 6) <frameset> divides the screen into numbers of section.
- 7) Using copyrighted material for personal use is fair use.
- 8) Search is the presale activity in trade cycle.
- 9) EDI is widely used by retailer.
- 10) Patent is a part of intellectual property right.

Q.3) Select the single correct answer [10 M]

- 1) _____ tag is used to create inline frame
a) <frame> b) <frameset> c) <no frame> d) <iframe>
- 2) _____ property specifies the exact location to write text.
a) Absolute b) Relative c) position d) none

Q-.2. Attempt any two of the following. [10]

- i) Draw a block diagram of OPAMP and explain the function of each block.
- ii) Explain with the help of diagram the working of Transistorised voltage regulator.
- iii) Draw the circuit diagram of Inverting amplifier and derive the expression for voltage gain.

Q.3 Attempt any Two of the following. [10]

- i) Explain working of a bridge Rectifier circuit.
- ii) Draw circuit diagram of Differentiator using OPAMP. Derive the expression for output voltage.
- iii) Explain working of Pi filter. Draw diagram.

Q.4. Attempt any TWO of the following. [10]

- i) Define Logic Gate. Draw Symbols and Truth table of any 4 Derived gates.
- ii) Why NAND Gates and NOR Gates are called universal gates. Prove for NAND Gate.
- iii) Compare Half adder with Full adder.

Q.5) Attempt any Two of the following- [10]

- i) Which type of MUX will be required to implement $F(A, B, C, D) = (0, 1, 4, 6, 9, 12, 15)$. Draw diagram.
- ii) Draw the circuit diagram of BCD to 7 segment decoder. Explain its working..
- iii) Write a note on Encoder.