

[Time: Three Hours]

[Marks: 100]

Please check whether you have got the right question paper.

- N.B:** i) All questions are compulsory
 ii) Figures to the right indicate full marks
 iii) Draw neat and labeled diagrams whenever necessary

Q.1 A. Choose the correct option from the following: 10

- a) Reserve food material in chlorophyta is _____.
 i) oil ii) proteins iii) fats iv) starch
- b) *Spirogyra* belongs to order _____.
 i) oscillatoriales ii) zygnematales iii) heterosiphonales iv) ectocarpales
- c) The chloroplast of _____ is spiral shaped
 i) *Volvox* ii) *Nostoc* iii) *Spirogyra* iv) *Zygnema*
- d) *Nostoc* reproduces by _____ methods.
 i) vegetative and asexual ii) sexual and asexual iii) vegetative and sexual
 iv) vegetative, sexual and asexual
- e) The cell wall of the fungal hyphae is made up of _____.
 i) chitin ii) pectin iii) cellulose iv) lignin
- f) _____ are non motile spores formed in sporangia on sporangiophores.
 i) Aplanospores ii) Zoospores
 iii) Conidiospores iv) Zygosporangia
- g) Fungi growing on dung of various animals is known as _____.
 i) obligate parasite ii) facultative parasite iii) coprophilous iv) predacious
- h) Genus *Riccia* is a _____.
 i) bryophyte ii) pteridophyte iii) fungi iv) algae
- i) The antherozoids of *Riccia* are _____.
 i) quadriflagellate ii) uniflagellate iii) biflagellate iv) multiflagellate
- j) In *Riccia*, the sporophyte is made up of _____.
 i) foot ii) seta iii) capsule iv) foot, seta, capsule

B. Answer the following in **one sentence**:

- a) What is heterocyst?
- b) What is mycelium?
- c) State the different parts of *Rhizopus* thallus.
- d) Name the male and female sex organs of *Riccia*.
- e) What are the different pigments found in chlorophyta.

10

Q 2 Answer **any two** from the following :

- a) Explain sexual reproduction in *Spirogyra*.
- b) Describe the structure of *Nostoc* colony, single filament and single cell.
- c) Explain different shapes of chloroplasts observed in Chlorophyta.
- d) Give a brief account of economic importance of algae.

20

Q.3 Answer **any two** from the following:

- a) Give a detailed account of asexual reproduction of *Rhizopus*.
- b) Discuss the sexual reproduction of *Aspergillus*.
- c) Describe the different modes of nutrition in fungi.
- d) Give an account of economic importance of fungi.

20

Q.4 Answer **any two** from the following:

- a) Describe the structure of sporophyte in *Riccia*.
- b) Give the systematic position of *Riccia* and explain the internal structure of its thallus.
- c) Write a detailed note on general characters of Hepaticae.
- d) Describe the gametophytic generation of *Riccia*.

20

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

- a) Vegetative cell of *Spirogyra*
- b) Systematic position of *Nostoc*
- c) Harmful effects of Fungi
- d) Gametangia of *Rhizopus*
- e) Fertilization in *Riccia*
- f) Spore and its germination in *Riccia*

20

[Time: Three Hours]

[Marks. 100]

Please check whether you have got the right question paper.

- N.B:** i) **All questions are compulsory**
 ii) **Figures to the right indicate full marks**
 iii) **Draw neat and labeled diagrams whenever necessary**

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

- a. Dark reaction of photosynthesis takes place in _____ of chloroplast.
 i. grana ii. stroma iii. outer membrane iv. thylakoids
- b. Calcium and Magnesium pectates constitute the _____.
 i. primary cell wall ii. middle lamella
 iii. secondary cell wall iv. plasma membrane
- c. Linear DNA molecules with histone proteins are found in _____ cells.
 i. eukaryotic ii. prokaryotic iii. viral iv. plasmids
- d. _____ membranes are associated with enzyme systems showing detoxification properties.
 i. RER ii. Chloroplast iii. Nucleus iv. SER
- e. _____ polysaccharide is made up of glucose molecules linked by glycosidic bonds.
 i. Pectin ii. Cellulose iii. Lignin iv. Suberin
- f. The rate at which the heterotrophic organism synthesizes energy yielding substance is called _____.
 i. primary productivity ii. biomass productivity iii. net productivity
 iv. secondary productivity
- g. _____ consists of evergreen and tall trees.
 i. Desert ii. Swamp forest iii. Deciduous forest iv. Tropical Rain forest
- h. Each step in the food chain is a _____ level.
 i. strata ii. layer iii. trophic iv. component
- i. When F_1 is crossed with pure recessive parent, it is called as _____.
 i. back cross ii. reciprocal cross iii. test cross iv. check cross
- j. The genetic constitution of organism represents the _____.
 i. phenotype ii. behavioral traits iii. genotype iv. physical traits

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

10

- a. Define net primary productivity.
- b. Why chloroplasts are important plant cell organelle?
- c. Give any two functions of cell wall.
- d. What is heterozygote ?
- e. Define monohybrid ratio.

Q.2. Answer any two of following. 20

- Explain the ultra structure of Plasma membrane. Add a note on its functions.
- Describe the ultra structure and functions of Endoplasmic reticulum.
- Explain the structure of a typical Eukaryotic plant cell.
- Write an account on the ultra structure and functions of chloroplast.

Q.3. Answer any two of following. 20

- Define ecosystem. Give an account of its different components.
- Give an account of tropical evergreen and temperate deciduous forests.
- Explain upright energy flow model.
- What is food chain and food web. Explain different types of food chain.

Q.4. Answer any two of following. 20

- Explain intermediate inheritance and co-dominance with suitable example.
- Define dihybrid ratio. Explain it with suitable example.
- Explain gene interaction with respect to comb pattern in fowl.
- In summer squashes gene 'W' is epistatic to gene 'Y' and 'y' and produces white colored fruits whenever present in homozygous or heterozygous dominant form **WW** or **Ww**. The gene 'Y' produces yellow colored fruits when present in dominant form **YY** or **Yy**. Homozygous recessive **yy** produces green colored fruits. Give the genotypes and phenotypes of progeny of the following crosses. Also give the phenotype of parents.

i. WwYy X WWYy ii. wwYy X wwyy

Q.5. Write short notes on any four 20

- Functions of cell wall
- Plasmodesmata and its functions
- Laws of thermodynamics
- Pyramid of Biomass
- Laws of Segregation
- Multiple alleles

Time: 3 Hours**Marks: 100****Please check whether you have got the right question paper.**

- 1) All the Questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) The use of log table / Non-programmable calculator is allowed.
- 4) Answers to the same question should be written together.

Q.1A) Select the correct option and complete the following sentences.**12****(Attempt any twelve)**

- i) _____ is a path function.
a) Energy b) Pressure c) Heat
- ii) _____ is an extensive property.
a) Temperature b) Pressure c) mass
- iii) 40g of NaOH in one dm^3 solution is _____.
a) 0.1N b) 0.01N c) 1M
- iv) _____ is a state function.
a) Work b) Heat c) Enthalpy
- v) A system that can exchange energy but not matter with surrounding is _____
a) closed b) Open c) isolated system
- vi) One mole of substance in 5dm^3 solution is _____.
a) 0.01M b) 0.2M c) 0.1N
- vii) The shell with $n=2$ is commonly referred to as _____.
a) K b) L c) M
- viii) The charge on the beta particle is _____.
a) neutral b) negative c) positive
- ix) According to Quantum theory $E=$ _____.
a) hc b) $h\nu$ c) $h/2\pi$
- x) The first period has only element/elements.
a) one b) two c) three
- xi) Slater proposed a set of rules for calculating
a) ionisation constant b) electronegativity c) shielding constant.

xiii) In ethanamine, nitrogen is ----- hybridized.

- a) sp^3 b) sp^2 c) sp

xiv) The carbocation is -----species.

- a) Neutral b) electron deficient c) electron rich

xv) The group exhibits -I effect.

- a) $-CN$ b) $-CH_3$ c) $C_6H_5O^-$

xvi) Cyclohexanol is alcohol.

- a) primary b) secondary c) tertiary

xvii) Anionic intermediate having a negative charge on trivalent carbon is known as ___

- a) carbocation b) carbanion c) carbon free radical

xviii) Nucleophiles are also known as

- a) Lewis acids b) Lewis bases c) neutral species

B) State whether the following sentences are true or false. (Attempt any three) 3

- i) Intensive properties depend on amount.
- ii) Enthalpy is a state function.
- iii) Electron enters in a shell in the order of increasing energy
- iv) Isoelectronic atoms or ions have same number of electrons.
- v) Monochloroacetic acid is a stronger acid than acetic acid.
- vi) Acetylene is non-linear molecule.

C) Match the following (attempt any five). 5

- | | |
|---------------------|--------------|
| 1) H | a) C^{5+} |
| 2) 1mg/L | b) BF_3 |
| 3) Hydrogenic atom. | c) RNH_2 |
| 4) Cs | d) 1ppm |
| 5) amide | e) CN^- |
| 6) electrophile | f) $U + PV$ |
| | g) $RCONH_2$ |
| | h) 55 |

Q.2 Attempt any four of the following.

A. Derive an equation for variation of heat of reactions with temperature. 5

B. Explain normality. What volume of 5M HNO_3 is required to prepare 100cm³ of 0.837M HNO_3 ? 5

C. Explain 1) Enthalpy 2) Internal Energy 5

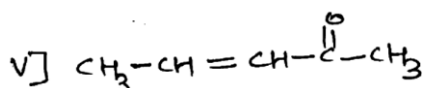
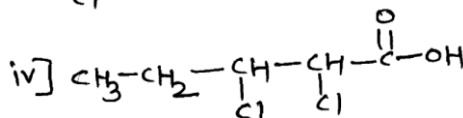
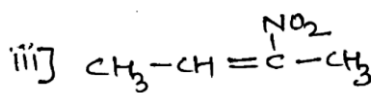
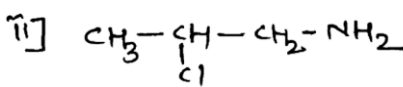
- D. Explain equivalent weight. Find the weight of H_2SO_4 required to prepare 250cm^3 of 0.05M H_2SO_4 solution. (At. Wt. H = 1, S=32, O=16). **5**
- E. What is heat of reaction? For reaction $\text{H}_2\text{F}_{2(\text{g})} \rightarrow \text{H}_{2(\text{g})} + \text{F}_{2(\text{g})}$ $\Delta E = -57.5 \text{ KJmol}^{-1}$ at 298 K. Calculate ΔH of reaction ($R = 8.31452 \text{ J.K}^{-1} \text{ mol}^{-1}$) **5**
- F. State first law of thermodynamics. Derive the mathematical expression for the same. **5**

Q.3 Attempt **any four** of the following.

- A. Discuss the postulates of Bohr's atomic model. **5**
- B. Write limitations of Rutherford's atomic model. **5**
- C. Calculate Z_{eff} faced by 2p electron in oxygen atom ($Z = 8$) for oxygen. **5**
- D. Describe in details about s and p block elements. **5**
- E. Discuss on the Mulliken's method for calculation of electronegativity. **5**
- F. Which factors affect the magnitude of enthalpy of ionisation? **5**

Q.4 Attempt **any four** of the following.

- A. Write IUPAC names of the following compounds: **5**



- B. Explain sp hybridization of carbon with suitable example. Draw orbital picture of ethene. **5**
- C. Discuss the stability of carbanion on the basis of resonance and inductive effect. **5**
- D. Explain the structure and shape of the dimethyl ether on the basis of hybridization of carbon and oxygen. **5**
- E. i) Define: electrophilic and nucleophilic reagents. Classify the following compounds as electrophilic and nucleophilic reagents: **3**
 AlCl_3 , SO_3 , CH_3OH , CH_3NH_2
- ii) Indicate the type of hybridization of C, O, N atoms in acetamide. **2**
- F. Draw the structure of the following compounds: **5**
- i) Cyclohexanamine ii) 2-methyl propanamide
- iii) Methyl cyclopentane carboxylate iv) 2-methyl-2-pentenoic acid
- v) Butanoyl chloride

Q.5 Attempt **any four** of the following.

A. Explain

i) ppm ii) ppb

B. Four moles of an ideal gas at 2 atm. & 28°C is compressed isothermally to one third of its volume by an external pressure of 4 atmosphere. Calculate the workdone ($R = 8.314JK^{-1}mol^{-1}$).

C. Write a note on Aufbau principle.

D. Give the classification of elements on the basis of their types.

E. What are free radicals? Explain the tertiary alkyl radicals are more stable than secondary and primary radicals.

F. Explain sp hybridization of nitrogen with suitable example. Draw orbital picture of methylamine.

[Time: Three Hours]

[Marks: 100]

Please check whether you have got the right question paper

- NB:** 1. All questions are compulsory.
 2. Answers to the same questions must be written together.
 3. Figures to the right indicate full marks.
 4. The use of log table/ non programmable calculator is allowed.

- Q 1 (A)** Select the correct option and complete the following statements (Any twelve) **(12)**
- Which of the following rate law of reactant 'A' and 'B' is second order?
 - Rate = $k [A] [B]^2$
 - Rate = $k[A] [B]$
 - Rate = $k [A]^2 [B]^2$
 - The half life time of a second order reaction is _____ to the initial concentration.
 - directly proportional
 - independent
 - inversely proportional
 - The unit of rate constant of a first order reaction involves _____.
 - only time
 - time and concentration
 - time and square of concentration
 - In general, the viscosity _____ with temperature.
 - decreases
 - increases
 - remains the same
 - Increasing molecular mass of a liquid, the viscosity _____.
 - increases
 - decreases
 - no effect
 - Among the following _____ has maximum viscosity.
 - water
 - ethyl alcohol
 - glycerine
 - Outer electronic configuration of group 16 elements is _____.
 - ns^2np^2
 - ns^2np^3
 - ns^2np^4
 - Oxidation state of sulphur in H_2SO_4 is _____.
 - +6
 - +5
 - 5
 - Which one of the following best defines the word "allotropes"?
 - Different structural forms of an element with same chemical properties.
 - Elements that possess properties intermediate between those of metals and non-metals.
 - The different phases (solid, liquid or gas) of a substance
 - Number of electrons in the valence shell of the O^{2-} ion are _____.
 - 2
 - 8
 - 10
 - Which one of the following shows catenation property?
 - Carbon
 - Lithium
 - Magnesium
 - Among the following, _____ can cause global warming.
 - H_2
 - O_2
 - CO_2
 - The isomer which rotates the plane of plane polarized light in clockwise direction is _____ isomer.
 - laevo
 - meso
 - dextro

- xiv) Molecule with one asymmetric carbon has _____ optical isomers.
 a) 2 b) 3 c) 4
- xv) n- butane has _____ conformations due to rotations about C₂-C₃ bond.
 a) 4 b) 6 c) 3
- xvi) In Z-E nomenclature, if high priority groups are on the same side of the double bond , then the isomer is called as _____ isomer.
 a) Z b) E c) Z-E
- xvii) Absolute configuration of (+)Tartaric acid can be detected using _____.
 a) colorimeter b) polarimeter c) X-ray diffraction
- xviii) The process of separating a racemic mixture into its component enantiomers is called _____.
 a) resolution b) solvation c) desolution

(B) State whether the following statements are **True** or **False** (3)
(Any Three)

- i) The rate constant of a reaction is the change in concentration of the any of the reactant per unit time.
- ii) Poise is the S.I unit of Viscosity.
- iii) Group 13 to 18 elements are known as s block elements.
- iv) CO produces toxic effect on human being due to its irreversible reaction with haemoglobin in the blood.
- v) Optical rotation is measured using polarimeter.
- vi) Horizontal lines in Fischer projection formula represents bonds that project above the plane of paper.

(C) Match the following columns **(Any Five)** (5)

(i)	Example of a bimolecular reaction is	(a)	Argon
(ii)	Smectic liquid crystals-	(b)	optically inactive
(iii)	Noble gas	(c)	$2\text{NO} \rightarrow \text{N}_2 + \text{O}_2$
(iv)	Peroxides	(d)	geometrical isomerism
(v)	Olefins	(e)	diamagnetic
(vi)	Racemic mixture	(f)	ethyl p-azoxy cinnamate
		(g)	paramagnetic
		(h)	$3\text{NO} \rightarrow \text{N}_2\text{O}$
		(i)	optically active

Q. 2 Attempt any Four of the following

- (A) Define i) order ii) molecularity iii) rate and iv) half life time of a reaction (5)
- (B) A reaction $\text{A} \rightarrow \text{Products}$ follows a first order reaction with (5)
 $k = 2.0 \times 10^{-2} \text{ s}^{-1}$. Calculate the concentration of A remaining after 100 seconds, if the initial concentration of A is 1.2 mol/L.
- (C) Derive the integrated rate equation of a second order reaction having equal (5)
 concentration of the reactants.

- (D) Define Viscosity of a liquid. How is it determined using a Ostwald's viscometer? (5)
- (E) In a Stalagmometer experiment, the same volume of organic liquid and water formed 30 and 25 drops respectively. If the surface tension of water is $7.2 \times 10^{-2} \text{ Nm}^{-1}$. Calculate surface tension of organic liquid. The density of organic liquid is $0.85 \times 10^3 \text{ kg m}^{-3}$ and that of water is $1.0 \times 10^3 \text{ kg m}^{-3}$. (5)
- (F) What are Liquid Crystals ? Discuss the classification of liquid crystals. (5)

Q. 3

Attempt any Four of the following

- (A) What is diagonal relationship between elements? Explain it with respect to beryllium and aluminium. (5)
- (B) How does nitrogen differ from other group 15 elements? (5)
- (C) How is sodium carbonate prepared? State any two each of its properties and uses. (5)
- (D) Formulate the hydroxides of alkali metals and compare their basic strengths. (5)
- (E) Give important applications of quick lime (any five). (5)
- (F) What are carbides ? How are alkali metal carbides prepared? (5)

Q. 4

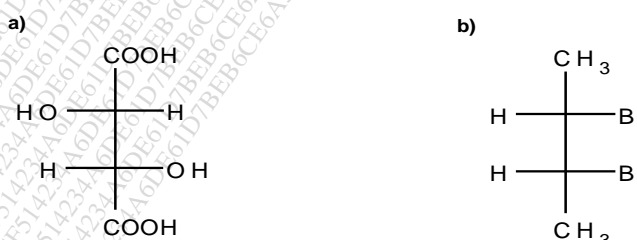
Attempt any Four of the following

- (A) Explain the terms with suitable examples:
a) Threo isomer b) Erythro isomer (5)
- (B) i) Distinguish between Enantiomers and Diastereoisomers. (3)
ii) Assign R or S descriptors (2)



- (C) i) Give the structures of the following (2)
a) D – glyceraldehyde
b) Cis -2 butene
ii) Identify chiral and achiral molecules (3)
a) CH_3CHBr_2
b) $\text{CH}_3\text{CH}(\text{OH})\text{Br}$
c) $\text{C}_2\text{H}_5\text{CH}(\text{Cl})\text{CH}_3$

- (D) Draw the conformations of n-Butane for rotation about $\text{C}_1\text{-C}_2$ bond and discuss their relative stabilities. (5)
- (E) Convert the following molecules from Fisher projection formula to Sawhorse formula. (5)



- (F) i) What are the characteristics of Meso isomers? (3)
ii) Discuss the causes of geometrical isomerism (2)

Q 5

Attempt any Four of the following

- (A) Explain how Graphical method is used to determine the first order and second order of a reaction. (5)
- (B) What do you mean by an optically active compound? The refractive index of a liquid at 25°C is 1.6 and its density is 0.87 g cm⁻³. Find the molar refraction of the liquid. (Molecular mass of the liquid is 78). (5)
- (C) Name any two oxides of Carbon. Write any two sources and control measures for each oxides of carbon. (5)
- (D) Write a brief note on Acid Rain. (5)
- (E) What is conformational analysis? Draw the various conformations of Ethane using Saw horse and Newman projection formula. (5)
- (F) Explain optical isomerism in Lactic acid. (5)

(2 ½ hours)

Total marks: 75

N. B (1) All questions are compulsory

(2) All questions have internal choice

(3) Figures to the right indicate full marks

1. A) Choose the correct alternative: **(any eight)** (8)

1. With reference to language, India officially follows a -----
(One national language policy, three language policy, multi-language policy)
2. The constitution of India recognizes minority on the basis of -----
(Age and religion, Caste and religion, Language and religion)
3. Limbu, Kota, Munda, Meena are....
(Textiles of India, Tribes of India, Hilly areas in North East India)
4. The most popular symbol of Baha'i faith in India is the
(Qutub Minar, Synagogue, Lotus temple)
5. Chandigarh, Lakshadweep, Puducherry are ----- of India.
(State capitals, States, Union Territories)
6. In Government aided higher educational institutions -----per cent is reserved for persons with disabilities.
(One, two, five)
7. Secularism in India means -----
(Equal treatment to all religions, power distribution among religious groups, state recognition of caste identities)
8. -----is a national party.
(Aam Aadmi Party, Asom Gana Parishad, Bahujan Samaj Party)
9. -----was formed as a separate state from Andhra Pradesh.
(Chattisgarh, Telangana, Hyderabad)
10. Right to privacy is now a -----in the constitution.
(Fundamental Right, Fundamental Duty, Economic policy)

1. B) State whether the following statements are True or False **(any seven):** (7)

1. The legendary leader Potti Sriramulu took fast unto death for a separate state for Telugu speakers.
2. Article 15 enables the government for affirmative action of SC/ST in terms of reservation in education and job.

3. For the purpose of Census, a person who can both read and write with understanding in any language, is treated as literate.
4. In modern India, the percentage of rural population is more than urban population.
5. 'Sons of the soil' theory implies jobs for all in a state.
6. India has a federal system with single citizenship.
7. Both Fundamental Rights and Directive Principles of State Policy are enforceable by court.
8. 73rd amendment to the Indian constitution refers to urban local bodies.
9. 1/3rd seats are reserved for women in Gram Panchayat.
10. Judicial Review means stands for the Supreme Court's right to declare a law passed in legislature as null and void.

2. A. Discuss the reasons for gender disparity in India and give reasons to combat the same. (15)

OR

B. Explain the term physical disability and discuss the problems of persons with disabilities (PwD) in India.

3. A. Discuss the inter-group conflicts caused due to caste inequalities in India society. Suggest measures to eradicate caste conflicts. (15)

OR

B. Comment on various issues regarding communalism in India.

4. A. Discuss the various features of the Indian constitution. (15)

OR

B. Write a note on the significance of Fundamental Duties for the realization of modern India.

5. A. Comment on the contribution of women towards Indian politics and suggest measures for increased participation. (15)

OR

B. Write short notes on **any three** of the following:

- i. Multiculturalism
- ii. India's literacy rates
- iii. Efforts towards achieving communal harmony
- iv. Multiparty system in India
- v. Panchayati Raj

वेळ: २ तास ३० मी.

गुण: ७५

सूचना: १.सर्व प्रश्न अनिवार्य आहेत.

२. उजवीकडील अंक पूर्ण गुण दर्शवितात.

३.आवश्यकता वाटल्यास इंग्रजी प्रश्नपत्रिका पहावी.

प्रश्न १.अ) रिकाम्या जागी योग्य शब्द लिहा.(कोणतेही आठ)

०८

१. भाषांच्या संदर्भात,भारतात अधिकृतपणेचे पालन केले जाते.
(एक राष्ट्रीय भाषा धोरण, त्री भाषीय धोरण, बहुभाषीय धोरण)
२. भारतीय राज्यघटनेने अल्पसंख्याकांना.....च्या आधारावर अधिकृत मान्यता दिली आहे.
(वय आणि धर्म, जाती आणि धर्म, भाषा आणि धर्म)
३. लिंबू,कोटा,मुंडा,मीना हेआहेत.
(भारतातील वस्त्रप्रकार, भारतातील आदिवासी, ईशान्य भारतातील डोंगराळ क्षेत्र)
४. भारतातील बहाई श्रद्धेचे सर्वात मोठे प्रतिकआहे.
(कुतुब मिनार,ज्युंके उपासनास्थान, लोटस मंदिर)
५. चंदीगड,लक्षद्वीप,पुदुचेरी हे भारतातील.....आहेत.
(राज्यांच्या राजधान्य, राज्य, केंद्रशासित प्रदेश)
६. शासन सहाय्यित उच्च शिक्षण संस्थांमध्ये विकलांग लोकांकरिता.....टक्के आरक्षण आहे.
(एक, दोन,पाच)
७. भारतातील धर्मनिरपेक्षता म्हणजेहोय.
(सर्व धर्मांना समान वागणूक, धार्मिक समूहांना सत्तेचे वितरण, जातीच्या स्वत्वासाठी राज्यांची अधिकृत मान्यता)
८.हा एक राष्ट्रीय पक्ष आहे.
(आम आदमी पार्टी, आसाम गण परिषद, बहुजन समाज पार्टी)
९. आंध्रप्रदेश पासून हे वेगळे राज्य निर्माण झाले.
(छत्तीसगड, तेलंगाना, हैदराबाद)
१०. गोपनीयतेचा हक्क हा आता राज्यघटनेतीलआहे.
(मुलभूत हक्क,मुलभूत कर्तव्य, आर्थिक धोरण)

१.ब) खालील विधाने चूक कि बरोबर आहेत ते सांगा.(कोणतेही सात)

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१. तेलगु भाषिकांकरिता वेगळ्या राज्यासाठी पोटी श्रीरामूलू यांनी आमरण उपोषण केले होते.
२. राज्यघटनेचे कलम १५ हे अनुसूचित जाती आणि अनुसूचित जमातीच्या शिक्षण आणि नोकरी च्या संदर्भात सरकारची सकारात्मक क्रिया सक्षम करते.
३. जनगणनेच्या दृष्टीने जी व्यक्ती कोणतीही भाषा वाचू आणि लिहू शकतो त्याबरोबरच समजू शकतो,त्याला साक्षर असे म्हणतात.
४. आधुनिक भारतात,नागरी लोकसंख्येपेक्षा ग्रामीण लोकसंख्येचे प्रमाण जास्त आहे.
५. 'धरतीपुत्रांची मागणी' सिद्धांत राज्यातील सर्वाना रोजगार सुचवते.
६. भारतात एकेरी नागरीकत्वासोबत संघराज्य पद्धती आहे.
७. मुलभूत हक्क आणि राज्य धोरण निर्देशक तत्वे दोन्ही न्यायालयीन अंमलबजावणीयोग्य आहेत.
८. भारतीय राज्यघटनेची ७३ वी घटनादुरुस्ती नागरी स्थानिक संस्थांशी संदर्भित आहे.
९. ग्रामपंचायत मध्ये स्त्रियांकरिता १/३ जागा आरक्षित आहेत.
१०. न्यायिक पुनरावलोकन म्हणजे विधिमंडळात संमत झालेले कायदे रद्दबातल घोषित करण्याचा सर्वोच्च न्यायालयाचा अधिकार होय.

२.अ) भारतातील स्त्री-पुरुष लिंगोत्तर विषमतेच्या कारणांची चर्चा करा आणि त्याच्या निराकरणासाठीची कारणे द्या.

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किंवा

ब) शारीरिकदृष्ट्या विकलांग हि संकल्पना स्पष्ट करा आणि विकलांग व्यक्तींच्या समस्यांची चर्चा करा.

३.अ) भारतीय समाजातील जातीय विषमतेमुळे निर्माण झालेल्या आंतर गट संघर्षाच्या कारणांची चर्चा करा.जातीय संघर्ष नष्ट करण्यासाठी उपाय सुचवा.

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किंवा

ब) भारतातील सांप्रदायिकतावादाशी संबंधित विविध समस्यांवर भाष्य करा.

४.अ) भारतीय राज्यघटनेच्या विविध वैशिष्ट्यांची चर्चा करा.

१५

किंवा

ब) आधुनिक भारताच्या परिपूर्तीसाठी मुलभूत कर्तव्यांचे महत्व यावर टीप लिहा

५.अ) भारतीय राजकारणासाठी स्त्रियांच्या योगदानावर भाष्य करा आणि सहभाग वाढविण्यासाठीचे उपाय सुचवा.

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किंवा

ब) टीपा लिहा (कोणत्याही तीन)

१५

- १) बहसंस्कृतीवाद
- २) भारताचा साक्षरता दर
- ३) जातीय सलोख्यासाठी प्रयत्न
- ४) भारतातील बहुपक्ष पद्धती
- ५) पंचायत राज

Q.P. Code : 00028

[Time: Three Hours]

[Marks:100]

Please check whether you have got the right question paper.

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

Q.1 A. Fill in the blanks by choosing the correct option given in the bracket.

05

- a) _____ build snares made up of silk fibers coated with mucus.
(Glow Worm/Firefly/Noctiluca)
- b) Rufous humming birds follows a _____ type of migration.
(Altitudinal/Loop/Longitudinal)
- c) The word 'Biodiversity' was coined by _____ in 1985.
(Shapiro/Wilson/W.G.Rosen)
- d) The Earth Summit was held in June 1992 at the Rio de Janeiro in _____
(Brazil/India/U.S.A)

Q. 1 B. Match the columns I & II and rewrite :

05

- | I | II |
|--------------------------------|-------------------------|
| a) <i>Pinctada vulqaris</i> | i) White Revolution |
| b) Anamalai Wildlife sanctuary | ii) Tamil Nadu |
| c) Sunderban National Park | iii) Water Conservation |
| d) Dr.Varghese Kurian | iv) West Bengal |
| e) Anna Hazare | v) Pearl formation |

Q. 1 C. State whether True or False.

05

- a) The female of Great Egg fly is the Batesian mimic of the distasteful common crow.
- b) In Sea horse parental care is exhibited by the female.
- c) Cryopreservation is conservation at low temperature in liquid nitrogen.
- d) Dr.Salim Ali was a renowned ornithologist of India.
- e) Ashokwan is a center for rehabilitation of Leprosy patients

Q.P. Code : 00028

- Q. 1 D. Answer in **one** Sentence only. 05
- What is Echolocation?
 - What is Autotomy?
 - Define the term Endemism.
 - Write the full form of CITES?
 - Who established Biocon in 1978 at Bangalore?
- Q.2 A. Describe Parental care and breeding in Pisces and Amphibians with one example each. 10
- OR**
- A. What is Regeneration? Explain with any two examples. 10
- Q. 2 B. Write Short notes on **any two**: 10
- Advantages and disadvantages of migration.
 - Mechanism of Bioluminescence.
 - Types of Coral reef
 - Desert adaptations in Camel.
- Q.3 A. Give an account of therats to biodiversity. 10
- OR**
- A. What is Biodiversity hotspot? Describe the prominent features of Indo-Burma hotspot. 10
- Q. 3 B. Write short notes on **any two**: 10
- Convention on Biological Diversity.
 - In-situ Conservation.
 - Indirect use value of biodiversity.
 - Man Wildlife conflict.
- Q.4 Answer **any two** of The Following 20
- Describe the life sketch of Dr.Varghese Kurian.
 - Give an account of work and achievements of Anna Hazare.
 - Describe the life sketch and achivements of Baba Amte.
 - Elaborate on Gadre fishery and its Surimi based value added products.
- Q.5 Write short notes **any four** 20
- Types of migration in bird.
 - National biodiversity action plan.
 - Significance of national park in conservation.
 - Awards won by Dr. Hargobind Khorana.
 - Lok Biradari Praklap.

Q.P. Code : 00028

Time: 3 hours

Marks: 100

Q1) A) Fill in the blanks choosing the correct options given in the bracket and rewrite the sentence:

(5 Marks)

- In the statistical term _____, the data divided in to two sides, in which one is greater and the other is smaller. (Mode, Median, Mean)
- _____ is the gram molecular weight of solute dissolved in one kilogram of solvent. (Normality, Molarity, Molality)
- _____ method of transgenesis is used to insert the DNA fragment into the embryonic stem cell.
(Cloning, DNA microinjection, Embryonic stem cell transplant)
- Insulin hormone is secreted by _____ of pancreas.
(β cells, δ cells, λ cells)
-) _____ instrument is used to count the hydrogen ion concentration in the solution.
(Electrophoresis, pH meter, colorimeter)

B) Match the **columns I and II** and rewrite:

(5 Marks)

Column I

Column II

- | | |
|-----------------------------|------------------------|
| a) Biohazards | i) Bar Diagram |
| b) Graphical representation | ii) DNA Fingerprinting |
| c) Celsius | iii) Pathogenic virus |
| d) RFLP | iv) Gene therapy |
| e) Cystic fibrosis | v) Temperature scale |

C) State whether **true or false**.

(5 Marks)

- Oxidising chemicals can destroy body tissue and metal parts.
- Mode value is always the middle value of the sample data.
- Deficiency of ADA enzyme causes Cystic fibrosis.
- PAGE electrophoresis method can be used to separate mixture of carbohydrate samples.
- Compound microscope can be used to magnify up to 10000X magnification.

D) Answer the following in **one sentence**:

(5 Marks)

- Define Normality
- Describe Mode
- What is VNTRs ?
- Describe chromatography
- Describe Ultra centrifuge

Q2) A) Answer **any one** of the following:

(10 Marks)

A) Describe the uses of safety symbols and explain the following pictogram Irritants, flammable and Oxidising agent.

OR

A) Explain simple, subdivided and multiple bar diagrams with suitable example.

- Q2) B) Write note on any two from the following: (10 Marks)**
- a) Molarity
 - b) Scope of Biostatistics.
 - c) Pie diagram
 - d) Safe laboratory measures

- Q3) A) Answer any one of the following: (10 Marks)**
- A) Describe the method of DNA finger printing.

OR

- A) Give the achievements in of Biotechnology in the field of Aquaculture/ Animal Husbandry/ Medical.

- Q3) B) Write note on any two from the following: (10 Marks)**
- a) Ethical issues of transgenesis
 - b) Cloning
 - c) Describe the method of animal cloning
 - d) In-vivo Gene therapy

- Q4) Answer any two from the following: (20 Marks)**
- a) Describe the principle and application of centrifuge.
 - b) Explain the principle and application of Colorimeter.
 - c) What is pH? Give principle and application of pH meter.
 - d) Describe the components of a compound microscope.

- Q5) Write short notes on any Four. (20 Marks)**
- a) What are Biohazards
 - b) Characteristics of solution
 - c) Green Florescent Protein Gene
 - d) Method of Nuclear transplantation
 - e) Explain the applications of PAGE
 - f) Write Principle and application of spectroscopy
