CLASS XII

SUBJECT- ENGLISH

1. You are Faiz/Falak Mazumdar living at 39, Udampur Colony, Shimla. You decide to hold a dinner party to congratulate your grandparents on their golden wedding anniversary. Draft a formal invitation in not more than 50 words to all family members to attend a grand dinner at home.

2. You are Harish/Harshita of 12, Seva Nagar, Pune. You want to sell your flat as you are shifting to another city for work. Draft a suitable advertisement in not more than 50 words to be published in *The Pune Times* under the classified columns.

3. You are Neeraj/Neeraja Shekhar, Principal, Vasant Public School, Pune. Your school has just started a music department. Write a letter to the Manager of Melody House, Pune, wholesale suppliers of musical instruments, placing an order for musical instruments for the school. Ask for a discount on the catalogue prices. (120 – 150 words).

4. Bal Vidya Public School, Bhilai, urgently requires a post-graduate teacher to teach political science for which they have placed an advertisement in *The Bhilai Express*. You are Sanjay/Sanjana Sharma from 21, Vasant Marg, Bhilai. Draft a letter including a CV, applying for the advertised post. (120 – 150 words).

5. Recent floods in many metropolitan cities of the country during the monsoon season laid bare the hollowness of the claims of the civic authorities of their preparedness. The poor had to bear the brunt of the problem while no one was ever held accountable. Write an article in 150 – 200 words on the common man's woes during the monsoons and the need for accountability of the officials concerned. You are Sumit/Smita Verma.

6. You are Ali/Alia, Head girl / Head boy of your school. You are deeply disturbed by the rising cases of aggressive behaviour of students in your school. You decide to speak during the morning assembly about it. Write a speech on 'Indiscipline in Schools'. (150 – 200 words).

7. ''Academic excellence is the only requirement for a successful career.'' Write a debate either for or against the motion. (120 – 150 words).

8. MMD School, Nashik, recently organised a science symposium on the topic : 'Effect of pollution on quality of life'. You are Amit/Amita Raazdan, editor of the school magazine. Write a report on the event for your school magazine. (120 – 150 words).

9. In one's approach to life one should be practical and not live in a world of dreams. How is Jansie's attitude different from that of Sophie ?

10. Fear is something that we must learn to overcome if we want to succeed in life. How did Douglas get over his fear of water?

11. At the end of the storytelling session, why does Jack consider himself 'caught in an ugly middle position'?

12. It may take a long time for oppression to be resisted, but the seeds of rebellion are sowed early in life. How did Zitkala-Sa face oppression as a child and how did she overcome it ?
13. How does the perception and attitude of the villagers of Raveloe towards Silas Marner change from the beginning to the end of the novel?
14. How is Godfrey Cass different from his younger brother, Dunstan?
15. Leadership is all about a strong concern for others. What light does Champaran episode throw on Gandhiji's leadership?
17. The people we meet in life leave an impression on us. How is the rattrap peddler affected by meeting the crofter and Edla?
18. Attempt a character sketch of the Governor in the story, 'Evans Tries an O-Level'. What was the only flaw in his handling of Evans?
19. How did Dr. Sadao face the dilemma he came across in his life ? What light does it throw on his character?
20. Who is a better person of the two, Godfrey or Dunstan? Why? Quote at least three examples from the novel, 'Silas Marner' in support of your view.
21. What is your impression of the role Nancy Lammeter plays in the novel, SilasMarner?
22. Hard work, not Intelligence paves the way to success in life. Write a debate. (150-200 words)
23. You are Ram/Rajani. Write a speech in 150-200 words on 'Importance of Morning Walk'.
24. Choice of course after clearing Senior School Examination produces a great deal of stress on the minds of our students. Counselling can be of great help to them. Write an article in 150-200 words on the topic, 'Role of counselling in choice of course'. You are Ram/Rajani.
25. You are Ram/Rajani, an N.C.C cadet who attended Republic Day Parade in Delhi. You study in Shyamala Public School, Salem. Write a report to be published in your school magazine, in 150-200 words on Republic Day Camp & Parade. Don't forget to mention the floats and how you enjoyed the occasion.

SUBJECT- PHYSICS

1. Draw a labelled ray diagram of a compound microscope and write an expression for its magnifying power.
2. The focal length of the objective and eye-lens of a compound microscope are 2 cm, 6×25 cm respectively. The distance between the lenses is 15 cm. (i) How far from the objective lens, will the object the be kept, so as to obtain the final image at the near point of the eye? (ii) Also calculate its magnifying power.
3. Draw a labelled ray diagram of an astronomical telescope, in the normal adjustment position and write the expression for its magnifying power.
4. An astronomical telescope uses an objective lens of focal length 15 m and eye-lens of focal length 1 cm. What is the angular magnification of the telescope?

5. With the help of a suitable ray diagram, derive the mirror formula for a concave mirror.
6. What is T I R.Write the condition for it.
7. Derive the lens makers formula.
8. Derive the expression for refractive index for material of prism .Draw i-d curve.
9. How does the resistivity of a conductor and semiconductor vary with temperature? Give the reason.
10. Write the expression for the force on a charge moving in a magnetic field. Deduce the condition under which this force is minimum and maximum.
11. A wire of 10Ωresistance is gradually stretched to double its length. It is then cut into two equal parts. These parts are then connected in parallel to a battery of 3 volt. Find the current drawn from the battery.
12. State the conditions for total internal reflection to occur. Calculate the speed of light in the medium whose critical angle is 45^0.
13. Write the thin lens formula for a convex lens and draw the graph showing the variation of U and V for a convex lens.
14. Two insulated charged copper spheres A and B of identical size have charges q and -3q respectively. When they are brought in contact with each other and then separated, what the new charges on them?
15. What happens to energy stored in a capacitor if after disconnecting the battery, the plates of a charged capacitor are moved farther?
16. State Kirchhoff's laws for electric circuits.
17. Calculate the amount of work done in rotating a dipole of dipole moment $3x\ 10^{-8}$ Cm from its position of stable equilibrium to the position of unstable equilibrium in a uniform electric field of intensity 10^4 N/C.
18. Define magnifying power of a telescope. Write its expression.
19. A converging and a diverging lens of equal focal lengths f each are placed coaxially in contact. Find the power and focal length of combination.
20. The radii of curvature of the faces of a double convex lens are 10cm and15cm.If the focal length of the lens is 12 cm, find the refractive index of the material of the lens.
21. Two polaroids are placed 90^0 to each other and the transmitted intensity is zero. What happens when one more Polaroid is placed in between these two bisecting the angle between them? Take intensity of unpolarised light I_0.How will the intensity of transmitted light vary on further rotating the third Polaroid?
22. Light of wave length 500nmfallsfrom a distant source on a slit 0.50mm wide. Find the distance between the two dark bands on either side of the central bright band of the diffraction pattern observed on a screen placed 2m from slits.

23. Define resolving power of a compound microscope. How does the resolving power of a compound microscope change when (i) refractive index of medium between the object and objective lens increases.(ii)wave length of radiation used increases ?
24. State the principle of working of a potentiometer. Draw the circuit diagram to compare the emf of two cells. Write the formula used for comparing the emf.
25. Deduce the expression for electrical energy density of a capacitor.
26. A 800 Pf capacitor is charged by a 100V battery. After some time the battery is disconnected. The capacitor is then connected to another 800Pf capacitor. What is the electrostatic energy stored?
27. State Gauss theorem in electrostatics. Obtain the expression for electric field at a point due to an infinitely long thin uniformly charged straight wire of linear charge density λ Cm^{-1}.
28. Derive an expression for resistivity of a conductor in terms of number density of free electrons and relaxation time.
29. Explain the principle and working of a cyclotron with the help of a diagram. Write the expression for cyclotron frequency.
30. Solve all NCERT exercises of chapter 3,4,6 7 and 9.

SUBJECT- MATHS

1. Check the following function for one-one and onto:- f: R -> [-1, 1], f(x) = $\sin^2 x$
2. Prove that the relation R = { (a,b)∈ $\mathbb{Z} X \mathbb{Z} : a - b \ is \ divisible \ by \ n$ } is an equivalence relation. what does "Congruence modulo 2" means?
3. If f(x)= log(1+x/1-x) , show that f(x) + f(y) = f((x+y)/ (1+ xy))
4. Determine which of the following functions f: R ~> R are a) One-one b) Onto.
   i) f(x) = |x| + x ii) f(x) = x - [x]
5. Evaluate
$$\begin{pmatrix} 2\cos 60^\circ & -2\sin 30^\circ \\ -\tan 45^\circ & \cos 0^\circ \end{pmatrix}\begin{pmatrix} \cot 45^\circ & \operatorname{cosec} 30^\circ \\ \sec 60^\circ & \sin 90^\circ \end{pmatrix}$$
6. Find x and y if
$$\begin{pmatrix} 3 & -2 \\ -4 & 4 \end{pmatrix}\begin{pmatrix} 2x \\ 1 \end{pmatrix} + 2\begin{pmatrix} -4 \\ 5 \end{pmatrix} = 4\begin{pmatrix} 2 \\ 1 \end{pmatrix}$$
7. If (a × b)× c = a × (b × c), where a, b and c are any three vectors such that a · b ≠ 0 ,
   b · c ≠ 0 , then find the angle between a and c .
8. Evaluate the following integral : $\int \frac{e^{2x}}{2+e^{x}} dx$.

9. Two horses are considered for a race. The probability of selection of the first horse is 1/4 and that of the second is 1/3. What is the probability that : (a) both of them will be selected (b) only one of them will be selected (c) none of them will be selected.

10. Solve the following linear equations using the matrix method : x+y+z=9, 2x+5y+7z=52, 2x+y-z=0.
11. If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \pi$ prove that : $x^2 - y^2 - z^2 + 2yz\sqrt{1-x^2} = 0.$

12. Find the area of the region bounded by the curves : $y = |x - 1|$ and $y = 3 - |x|$.
13. If $f(x + y) = f(x).f(y \forall x, y$ and $f(5) = 2, f'(0) = 3$, then the value of $f'(5)$ is ?
14. For what value of x, the sum of x and its inverse gives the minimum value of the sum ?
15. The value of the integral $I = \int X(1-x)^n \, dx$ where lower limit =0 and upper limit = 1.
16. Find the area of the region bounded by the curves $y = |x - 2|$, $x = 1$, $x = 3$ and the x axis.
17. The area enclosed between the curve $y = \log e (x + e)$ and the coordinate axes is ?
18. A die is tossed 5 times. Getting an odd number is considered a success. Then the variance of distribution of success is?
19. The probability that *A* speaks truth is 4/5, while this probability for *B* is 3/4. Find the probability that they contradict each other when asked to speak on a fact .
20. The mean and the variance of a binomial distribution are 4 and 2 respectively. Then find the probability of 2 successes .
21. Three houses are available in a locality. Three persons apply for the houses. Each applies for one house without consulting others. Find the probability that all the three apply for the same house .
22. The d.r. of normal to the plane through (1, 0, 0), (0, 1, 0) which makes an angle $\pi/4$ with plane $x + y = 3$ are ?
23. A tetrahedron has vertices at *O* (0, 0, 0), *A* (1, 2, 1), *B* (2, 1, 3) and *C* (–1, 1, 2). Then find the angle between the faces *OAB* and *ABC* .
24. The line passing through the points (5, 1, *a*) and (3, *b*, 1) crosses the *yz* plane at the point $(0, \frac{17}{2}, \frac{13}{2})$ .Find a and b .
25. Find the distance between two the planes $2x + y + 2z = 8$ and $4x + 2y + 4z + 5 = 0$.

SUBJECT- CHEMISTRY

Haloalkanes and Haloarenes

Q 1:Name the following halides according to IUPAC system and classify them as alkyl, allyl, benzyl (primary, secondary, tertiary), vinyl or aryl halides :

(i)$(CH_3)_2CHCH(Cl)CH_3$
(ii)$CH_3CH_2CH(CH_3)CH(C_2H_5)Cl$
(iii)$CH_3CH_2C(CH_3)_2CH_2I$
(iv)$(CH_3)_3CCH_2CH(Br)C_6H_5$
(v)$CH_3CH(CH_3)CH(Br)CH_3$
(vi)$CH_3C(C_2H_5)_2CH_2Br$
(vii) $CH_3C(Cl)(C_2H_5)CH_2CH_3$

(viii) $CH_3CH=C(Cl)CH_2CH(CH_3)_2$

(ix) $CH_3CH=CHC(Br)(CH_3)_2$

(x) p-$ClC_6H_4CH_2CH(CH_3)_2$

(xi) m-$ClCH_2C_6H_4CH_2C(CH_3)_3$

(xii) o-Br-$C_6H_4CH(CH_3)CH_2CH_3$

Q8: How will you bring about the following conversions?
(i) Ethanol to but-1-yne
(ii) Ethane to bromoethene
(iii) Propene to 1-nitropropane
(iv) Toluene to benzyl alcohol
(v) Propene to propyne
(vi) Ethanol to ethyl fluoride
(vii) Bromomethane to propanone
(viii) But-1-ene to but-2-ene
(ix) 1-Chlorobutane to n-octane
(x) Benzene to biphenyl.
Q2: Explain why ;
(i) Cyclohexyl Chloride has a higher dipole moment than chlorobenzene.
(ii) alkyl halides, despite being polar are not miscible with water.
(iii)Grignard reagents are prepared under anhydrous conditions.
Q3: Arrange the compounds of each set in order of reactivity towards SN2 displacement:
(i) 2-Bromo-2-methylbutane, 1-Bromopentane, 2-Bromopentane
(ii) 1-Bromo-3-methylbutane, 2-Bromo-2-methylbutane, 3-Bromo-2-methylbutane
(iii) 1-Bromobutane, 1-Bromo-2,2-dimethylpropane, 1-Bromo-2-methylbutane, 1Bromo-3- methylbutane.
Q4: How the following conversions can be carried out?
(i) Propene to propan-1-ol
(ii) Ethanol to but-1-yne
(iii) 1-Bromopropane to 2-bromopropane
(iv) Toluene to benzyl alcohol
(v) Benzene to 4-bromonitrobenzene
(vi) Benzyl alcohol to 2-phenylethanoic acid
(vii) Ethanol to propanenitrile

(viii) Aniline to chlorobenzene
(ix) 2-Chlorobutane to 3, 4-dimethylhexane
(x) 2-Methyl-1-propene to 2-chloro-2-methylpropane
(xi) Ethyl chloride to propanoic acid
(xii) But-1-ene to n-butyliodide
(xiii) 2-Chloropropane to 1-propanol
(xiv) Isopropyl alcohol to iodoform
(xv) Chlorobenzene to p-nitrophenol
(xvi) 2-Bromopropane to 1-bromopropane
(xvii) Chloroethane to butane
(xviii) Benzene to diphenyl
(xix) tert-Butyl bromide to isobutyl bromide
(xx) Aniline to phenylisocyanide

Q5: Primary alkyl halide C4H9Br (a) reacted with alcoholic KOH to give compound (b). Compound (b) is reacted with HBr to give (c) which is an isomer of (a). When (a) is reacted with sodium metal it gives compound (d), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (a) and write the equations for all the reactions.

Alcohols, Phenols and Ethers

Q1 : Give the structures of the compounds whose IUPAC names are given below :

(i) 2 – Methylbutan – 2 – ol

(ii) 1 – Phenylpropan – 2 – ol

(iii) 3 , 5 – Dimethylhexane – 1 , 3 , 5 – triol

(iv) 2, 3 – Diethylphenol

(v) 1 – Ethoxypropane

(vi) 2 – Ethoxy – 3 – methylpentane

(vii) Cyclohexylmethanol

(viii) 3 – Cyclohexylpentan – 3 – ol

(ix) Cyclopent – 3 – en – 1 – ol

(x) 3 – Chloromethylpentan – 1 – ol.

Q 2: Explain with a suitable example the hydroboration – oxidation reaction?
Q 3: Write the mechanism of hydration of ethene to yield ethanol.
Q4: Give a detailed explain for each of the following.

(i) Kolbe's reaction.
(ii) Reimer – Tiemann reaction.
(iii) Williamson ether synthesis.
(iv) Unsymmetrical ether.

Q 5: Give a detailed explanation of acid – catalyzed dehydration of ethanol to yield ethene.

ALDEHYDES, KETONES AND CARBOXYLLIC ACID

Q1: What do you mean by the following terms? Give an example of the reaction.

(i) Cyanohydrin

(ii) Acetal

(iii) Semicarbazone

(iv) Aldol

(v) Hemiacetal

(vi) Oxime

(vii) Ketal

(vii) Imine

(ix) 2,4-DNP-derivative

(x) Schiff's base

Q2: Name the following compounds according to IUPAC system of nomenclature:

(i) $CH_3CH(CH_3)CH_2CH_2CHO$

(ii) $CH_3CH_2COCH(C_2H_5)CH_2CH_2Cl$

(iii) $CH_3CH=CHCHO$

(iv) $CH_3COCH_2COCH_3$

(v) $CH_3CH(CH_3)CH_2C(CH_3)_2COCH_3$

(vi) $(CH_3)_3CCH_2COOH$

(vii)$OHCC_6H_4CHO$-p

Q3: An organic compound with the molecular formula $C_9H_{10}O$ forms 2, 4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction. On vigorous oxidation, it gives 1, 2- benzenedicarboxylic acid. Identify the compound.

Q4: An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolysed with dilute sulphuric acid to give a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid produced (B). (C) on dehydration gives but-1-ene.Write equations for the reactions involved.

Q5: Arrange the following compounds in increasing order of their property as indicated:

(i) Acetaldehyde, Acetone, Di-tert-butyl ketone, Methyl tert-butyl ketone (reactivity towards HCN)

(ii) $CH_3CH_2CH(Br)COOH$, $CH_3CH(Br)CH_2COOH$, $(CH_3)_2CHCOOH$, $CH_3CH_2CH_2COOH$ (acid strength)

(iii) Benzoic acid, 4-Nitrobenzoic acid, 3,4-Dinitrobenzoic acid, 4-ethoxybenzoic acid (acid strength)

Q6: Give simple chemical tests to distinguish between the following pairs of compounds.

(i) Propanal and Propanone

(ii) Acetophenone and Benzophenone

(iii) Phenol and Benzoic acid

(iv) Benzoic acid and Ethyl benzoate

(v) Pentan-2-one and Pentan-3-one

(vi) Benzaldehyde and Acetophenone

(vii) Ethanal and Propanal

Q7: How will you bring about the following conversions in not more than two steps?

(i) Propanone to Propene

(ii) Benzoic acid to Benzaldehyde

(iii) Ethanol to 3-Hydroxybutanal

(iv) Benzene to m-Nitroacetophenone

(v) Benzaldehyde to Benzophenone

(vi) Bromobenzene to 1-Phenylethanol

(vii) Benzaldehyde to 3-Phenylpropan-1-ol

(viii) Benazaldehyde to α-Hydroxyphenylacetic acid

(ix) Benzoic acid to m- Nitrobenzyl alcohol

Q8: Describe the following:

(i) Acetylation

(ii) Cannizzaro reaction

(iii) Cross aldol condensation

(iv) Decarboxylation

Q9: Give plausible explanation for each of the following:

(i) Cyclohexanone forms cyanohydrin in good yield but 2, 2, 6 trimethylcyclohexanone does not.

(ii) There are two $-NH_2$ groups in semicarbazide. However, only one is involved in the formation of semicarbazones.

(iii) During the preparation of esters from a carboxylic acid and an alcohol in the presence of an acid catalyst, the water or the ester should be removed as soon as it is formed.

Q10: An organic compound contains 69.77% carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollens' reagent but forms an addition compound with sodium hydrogensulphite and

give positive iodoform test. On vigorous oxidation it gives ethanoic and propanoic acid. Write the possible structure of the compound.

AMINES

Q1 : Give IUPAC names for the compounds given below & categorize them into primary, secondary & tertiary amines.

(i) $(CH_3)_2 CH NH_2$

(ii) $CH_3 (CH_2)_2 NH_2$

(iii) $CH_3 NH CH (CH_3)_2$

(iv) $(CH_3)_3 CNH_2$

(v) $C_6H_5 NH CH_3$

(vi) $(CH_3 CH_2)_2 N CH_3$

(vii) m – Br $C_6 H_4 NH_2$

Q 2 : Mention chemical tests to differentiate between the pairs of compounds given below.

(i) dimethylamine & Methylamine

(ii) Tertiary amines & Secondary

(iii) Aniline & Ethylamine

(iv) benzylamine & Aniline

(v) N – methylaniline & Aniline

Q 3 : Reason the following statements given below :

(i) p K_b of methylamine is lesser than that of aniline .

(ii) Aniline is not soluble in water whereas Ethylamine is.

(iii) Methylamine in water when made to react with ferric chloride precipitates hydrated ferric oxide.

(iv) Aniline when nitrated gives a substantial amount of m – nitroaniline, while amino group is o, p – directing in aromatic electrophilic substitution reactions.

(v) Aniline does not take Friedel – Crafts reaction.

(vi) On comparing the stabilities, we observe that, the stability of Diazonium salts of aromatic amines is more than that of aliphatic amines.

(vii) Gabriel phthalimide synthesis is usually preferred for synthesizing primary amines.

Q 4 : Answer the questions given below :

(i) Arrange the following compounds in the decreasing order of the p K_b values :
$C_2 H_5 NH_2$, $C_6 H_5 NH CH_3$, $(C_2 H_5)_2 NH$ & $C_6 H_5 NH_2$

(ii) Arrange the following compounds in the escalating order of basic strength :
$C_6 H_5 NH_2$, $C_6 H_5 N (CH_3)_2$, $(C_2 H_5)_2 NH$ & $CH_3 NH_2$

(iii) Arrange the following compounds in the escalating order of basic strength :

(a) p – nitroaniline , Aniline, & p – toluidine

(b) $C_6 H_5 NH_2$, $C_6 H_5 NH CH_3$, $C_6 H_5 CH_2 NH_2$.

(iv) Arrange the following compounds in decreasing order of basic strength in gas phase :

$C_2 H_5 NH_2$, $(C_2 H_5)_2 NH$, $(C_2 H_5)_3 N$ & NH_3

(v) Arrange the following compounds in escalating order of boiling point :

$C_2 H_5 OH$, $(CH_3)_2 NH$, $C_2 H_5 NH_2$

(vi) Arrange the following compounds in escalating order of solubility in water :

$C_6 H_5 NH_2$, $(C_2 H_5)_2 NH$, $C_2 H_5 NH_2$.

Q 5 : How will you convert :

(i) Ethanoic acid into methanamine

(ii) Hexanenitrile into 1 – aminopentane

(iii) Methanol to ethanoic acid

(iv) Ethanamine into methanamine

(v) Ethanoic acid into propanoic acid

(vi) Methanamine into ethanamine

(vii) Nitromethane into dimethylamine

(viii) Propanoic acid into ethanoic acid

Q6: Explain the following given below :

(i) Carbylamine reaction

(ii) Diazotisation

(iii) Hofmann's bromamide reaction

(iv) Coupling reaction

(v) Ammonolysis

(vi) Acetylation

(vii) Gabriel phthalimide synthesis.

Q7: Give structures for the following conversions:

(i) Nitrobenzene to benzoic acid

(ii) Benzene to m – bromophenol

(iii) Benzoic acid to aniline

(iv) Aniline to 2, 4 ,6 – tribromofluorobenzene

(v) Benzyl chloride to 2 – phenylethanamine

(vi) Chlorobenzene to p – chloroaniline

(vii) Aniline to p – bromoaniline

(viii) Benzamide to toluene

(ix) Aniline to benzyl alcohol.

Q8: An aromatic compound 'A' on treatment with aqueous ammonia & heating forms compound 'B' which on heating with Br_2 & KOH forms a compound ' C ' of

molecular formula C_6H_7N. Write the structures & IUPAC names of compounds A , B & C.

Q9: Give detailed explanation for the following statements given below :

(i) Why are alcohols more acidic than amines of comparable molecular masses?

(ii) Why do tertiary amines have lower boiling point than primary amines?

(iii) Why are aromatic amines weaker bases than aliphatic amines ?

BIOMOLECULES

Q1. Explain monosaccharide?

Q 2. Explain reducing sugars?

Q 3. What are two main functions of carbohydrates in plants?

Q 4. Categorise the given carbohydrates into monosaccharides and disaccharides.

2-deoxyribose, Ribose, maltose, lactose , galactose and fructose

Q 5. What is meant by the term glycosidic linkage?

Q 6. Explain glycogen. What are the difference between starch and glycogen?

Q 7. What will be the product after hydrolysing the (a) sucrose and (b) lactose?

Q 8. What is the difference in structures between cellulose and starch?

Q 9. What will happen when a D – glucose is treated with the reagents given below?

(a) HI

(b) Bromine water

(b) HNO3

Q 10. List all the reactions of D- glucose which a open chain structure can't be explain.

Q 11. Explain what an essential amino acid is and what a non – essential amino acid is? Also give two examples for each the types.

Q 12. Relate the following with proteins.

(a) Primary Structure (b) Peptide Linkage (c) Denaturation

Q 13. What are the common types of secondary structure of proteins?

Q 14. What type of bonding helps in stabilising the α -helix structure of proteins?

Q 15. Differentiate between fibrous and globular proteins.

Q 16. Explain atmospheric behaviour of amino acid?

Q 17. Explain what is an enzyme?

Q 18. What will be the outcome of denaturatuion on the structure of proteins?

Q 19. How can vitamins be classified? Name the vitamin which is a reason for the coagulation of blood.

Q 20. Vitamin C and Vitamin C are essential to use. Why? Also list their important sources.

Q 21. What are nuclic acids? Give their two important functions.

Q 22. What is the difference between a nucleotide and a nucleoside?

Q 23. Explain the term “The two strands in DNA are not identical but are complementary”.

Q 24. Differentiate between NDA and RNA on the basis of their functions and structures. .

Q25: State the different types of RNA found in the cell

POLYMER

Q1: Define the following terms: monomer and polymer.

Q3: Differentiate between homo-polymer and co-polymer by giving example of each.

Q4: Briefly explain the functional of a monomer?

Q5: Explain the term polymerization.

Q6: Determine whether (−NH—CHR—C0−)n , is a homo-polymer or a co-polymer?

Q7: Determine the classes in which the polymers are classified on the basis of molecular forces?

Q8: Differentiate between condensation and addition polymerization?

Q9: Explain co-polymerization with the help of two examples.

Q10: Explain free radical mechanism for polymerisation of the ethene.

Q 11: Define thermosetting and thermoplastics polymers? Give two examples of thermosetting and thermoplastics polymers?

Q 12: List out the monomers used for obtaining the below polymers.
(1) Polyvinyl chloride (2) Teflon (3) Bakelite

Q 13: Write the name and structure of one common initiators, which are used in free radical ddition polymerisation.

Q 14: How do the presence of double bonds in rubber molecules influence their structure and reactivity?

Q 15: Discuss the main purpose of vulcanization of rubber.

Q 16: Give the monomeric repeating units of Nylon-6 and Nylon-6, 6?

Q 17: List out the names and its structures of the monomers for the following polymers:
(i) Buna-S (ii) Buna-N (iii) Dacron (iv) Neoprene

Q 18: How can dacron be obtained from terephthalic acid and ethylene glycol?

Q 19: What is a biodegradable polymer? Give an example of a biodegradable aliphatic polyester.

CHEMISTRY IN EVERYDAYLIFE

Q1: Why should we distinguish drugs in different ways?

Q2: Explain drug targets or target molecules used in medicinal chemistry.

Q3: Give some macromolecules that are chosen as drug targets.

Q4: Medicine should not be taken without consulting a doctor. Why is it like that?

Q5: What is chemotherapy?

Q 6: Name the forces which are involved in holding the drugs to the active site of enzymes?

Q7: Antacids and antiallergic drugs intervene with the function of the histamines, and why do they not intervene with each other?

Q8: Level of noradrenaline if low can cause depression. Name the kind of drugs used to solve this problem? Give the names of two drugs.

Q 9: Explain the term 'broad spectrum antibiotics?

Q 10: How are antiseptics different from disinfectants? Give one example of each.

Q11: Ranitidine and cimetidine better antacids than sodium hydrogen carbonate or aluminum hydroxide or magnesium. Explain

Q12: Which substance can be used as an antiseptic as well as a disinfectant?

Q13: What are the main constituents of dettol?

Q14: What meant by tincture of iodine? Mention its use?

Q15: What are Food preservatives?

Q16: Why is aspartame used for cold foods and drinks only?

Q 17: What are artificial sweetening agents? Give two examples.

Q18: Give the sweetening agent which is used in the preparation of sweets for diabetic patients.

Q19: What is the disadvantage in using alitame as an artificial sweeten?

Q20: Why is synthetic detergents better than soap?

Q 21: illustrate with examples the cationic detergent, anionic detergent and non-ionic detergent

Q 22: What are biodegradable and non-biodegradable detergents? Give one example of each.

Q23: Explain why soaps do not work in hard water?

Q 24: Which one should be used for finding the hardness of water, soaps or synthetic detergents?

Q 25: Explain the cleansing action of soaps?

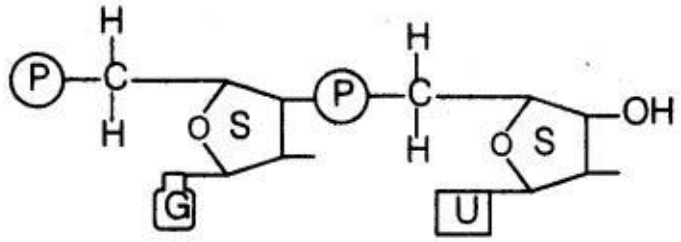
NOTE:

1. Write the answers in a separate note copy.
2. All the questions are given from chemistry part-II book keeping in mind the CBSE board exam.

SUBJECT- BIOLOGY

MOLECULAR BASIS OF INHERITANCE

1. What is a cistron?
2. Name the enzyme and state its property that is responsible for continuous and discontinuous replication of the two strands of a DNA molecule.
3. Describe the structure of a RNA polynucleotide chain having four different types of nucleotides.
4. Answer the questions based on the dinucleotide shown below



   (a) Name the type of sugar guanine base is attached to.
   (b) Name the linkage connecting the two nucleotides.
   (c) Identify the 3' end of the dinucleotide. Give a reason for your answer.

5. Following are the features of genetic codes. What does each one indicate? Stop codon; Unambiguous codon; Degenerate codon; Universal codon.
6. Describe Meselson and Stahl's experiment that was carried in 1958 on *E.Coli.* Write the conclusion they arrived at after the experiment.
7. (a) Describe the process of transcription in bacteria

   (b) Explain the processing the hnRNA needs to undergo before becoming functional mRNA eukaryotes.

8. Differentiate between the genetic codes given below:

   (a) Unambiguous and universal

   (b) Degenerate and initiator

9. (a) Describe the structure and function of a t-RNA molecule. Why is it referred to as an adapter molecule?

   (b) Explain the process of splicing of hn RNA in an eukaryotic cell.

10. Write the different components of a lac-operon in E.coli. Explain its expression while in an 'open' state.
11. (a) Describe the various steps of Griffith's experiment that led to the conclusion of the 'Transforming Principle'.

    (b) How did the chemical nature of the 'Transforming Principle' get established?

12. State the difference between the structural genes in a Transcription Unit of Prokaryotes and Eukaryotes.
13. Explain the process of transcription in prokaryotes. How is the process different in eukaryotes?
14. Name the scientists who proved experimentally that DNA is the genetic material. Describe their experiment.
15. (a) A DNA segment has total of 1000nucleotides, out of which 240 of them are adenine containing nucleotides. How many pyrimidine bases this DNA segment possesses?

    (b) Draw a diagrammatic sketch of a portion of DNA segment to support your answer.
16. The base sequence in one of the strands of DNA is TAGCATGAT.
    (i) Give the base sequence of the complementary strand.
    (ii)How are these base pairs held together in a DNA molecule?
    (iii)Explain the base complementarity rule. Name the scientist who framed this
17. **(**i)Name the enzyme that catalyses the transcription of hnRNA.

    (ii)Why does the hnRNA needs to undergo changes? List the changes hnRNA undergoes and where in the cell such changes take place.
18. i) Explain the process of DNA replication with the help of a schematic diagram.
    (ii) In which phase of the cell cycle does replication occur in eukaryotes? What would happen if cell division is not followed after DNA replication?
19. (i) Explain DNA polymorphism as the basis of genetic mapping of human genome.

    (ii) State the role of VNTR in DNA fingerprinting.
21. Explain the role of regulatory gene in a lac operon. Why is regulation of lac operon called negative regulation?
22. (i) Name the enzyme responsible for the transcription of tRNA and the amino acid, the tRNA gets linked with.

(ii) Explain the role of initiator tRNA in intiation of protein synthesis.

23. Prepare an Investigatory project related to any topic from class XII biology syllabus.

SUBJECT- COMPUTER SCIENCE

1. (*a*) Write two major differences between Object Oriented Programming and Procedural Programming.
(*b*) Name the header files, to which following built-in functions belong to:
(*i*) isalnum() (*ii*) gets() (*iii*) fabs() (*iv*) strlen()

(*c*) Find the syntax error(s), if any, in the following program:

```
#include (iostream.h)
void main( )
{
int X, Y;
cin >> X;
for (Y = 0; y < 10, Y++)
If X == Y
cout << Y+X;
else
cout >> Y;
}
```

(*d*) Give the output of the following program:

```
char *NAME = "CoMPutER";
for (int x = 0; x < strlen(NAME); x++)
if (islower(NAME[x]))
NAME[x] = toupper(NAME[x]);
else
if (isupper(NAME[x]))
if (x%2==0)
NAME[x] = tolower(NAME[x]);
else
NAME[x] = NAME[x-1];
puts(NAME);
```

(*e*) Write the output of the following program:

```
#include<iostream.h>
void Execute(int &B, int C = 100)
{
int TEMP = B+C;
B += TEMP;
if(C != 200)
cout << TEMP << B << C << endl;
}
void main ( )
{
int M = 90, N = 10;
Execute(M);
cout << M << N << endl;
Execute(M, N);
cout << M << N << endl;
}
```

(*f*) Write a C ++ function having two value parameters U and n with result type float to find the sum of

series given below :
1 – U + ½!U2 – 1/3! U3 + ¼! U4 +..... –.....+.....–

Q2. (*a*) What do you understand by constructor and destructor functions used in classes ? How are these
functions different from other member functions ?
(*b*) Define a class employee with the following specifications :
private members of class employee
empno integer
ename 20 characters
basic, hra, da float
netpay float
calculate() A function to calculate basic + hra + da with float return type
public member function of class employee
havedata() function to accept values for empno, sname, basic, hra, da and invoke
calculate() to calculate netpay.
dispdata() function to display all the data members on the screen.
(*c*) Consider the following declarations and answer the questions given below :

```
class WORLD
{
        int H;
protected :
        int S;
public :
        void INPUT(int);
        void OUTPUT();
};
class COUNTRY : private WORLD
{
        int T;
protected :
        int U;
public :
        void INDATA( int, int)
        void OUTDATA();
};
class STATE : public COUNTRY
{
        int M;
public :
        void DISPLAY (void);
};
```

(*i*) Name the base class and derived class of the class COUNTRY.
(*ii*) Name the data member(s) that can be accessed from function DISPLAY().
(*iii*) Name the member function(s), which can be accessed from the objects of class STATE.
(*iv*) Is the member function OUTPUT() accessible by the objects of the class COUNTRY ?

Q3. (a) What is polymorphism ? Give an example in C++ to show its implementation in C++.
(b) Write the name of header files to which the following belong :
(i) sqrt() (ii) strcpy() (iii) isalpha() (iv) open()
(c) Rewrite the corrected code for the following program, underline each correction (if any) :

```
#include<iostream.h>
void main()
{
int a,b;
cin>>a>>b;
int s = sum(a,b);
cout<<s;
}
void sum(int a,int b)
{
cout<<(a+b);
}
```

(d) Find the output of the following program, assuming that all required header files have been included:

```
void change(int x[4], int i) {
x[I] = x[I] * i;
}
void main() {
int x[] = {11, 21, 31, 41};
for(int i =0;i<4;i++) {
change(x, i);
cout<<x[i]<<"\n";
}
}
```

(e) Find the output of the program assuming all the required header files have been included :

```
void main() {
int x[] = {10, 20, 30, 40,50};
int *p, **q;
int *t;
```

```
p = x;
t = x + 1;
q = &t;
cout<<*p<<","<<**q<<","<<*t++;
}
```

(f) Write definition for a function SumSeries() in C++ with two arguments/ parameters – double x and int n. The function should return a value of type double and it should perform sum of the following series:

$x – x^2/2 + x^3/!3 + x^4/!4- ..... upto N terms$

Q4 .(a) What is the difference between nesting and inheritance ? Explain with the help of an example.

(b) Define a class with complete function definitions COMPETITION in C++ with following specifications:

private members

event_no	integer
description	char(30)
score	integer
qualified	char
public	members
input()	To take input for event_no, description and score
Award ( )	To award qualified as ‘y’ if score is more than the cut off score passed as int to the function else award ‘N’
show()	To display all details

(c) Consider the following class definitions and answer the questions following it :

```
class Base {
int A1;
void BF1( );
protected :
int B1;
void BF2( );
public:
int C1;
void BF3( );
} ob1;
class Middle : private Base {
int A2;
protected :
int B2;
void MF1( );
public:
int C2;
void MF3( );
```

```
} ob2;
class Derived : protected Middle
{
void DF1();
int A3;
public:
int B3;
void DF2( );
} ob3;
```

(i) Name the member functions accessible to the objects of Derived.
(ii) Name the data members that are accessible in function DF1().
(iii) What would be the size of class derived objects ?
(iv) Name the data members that are accessible in function F1( ).
