G.D. Goenka Public School, Vasant Kunj
Holiday Engagement- 2020-21
CLASS XII

ENGLISH

To quote Philip Adams

"When people say to me: 'How do you do so many things? 'I often answer them, without meaning to be cruel: 'How do you do so little?'"

GENERAL INSTRUCTIONS:
Do the assignment in your blue writing skills notebook: Write an essay! Practice Brainstorming and outlining! Length is important! Top scoring SAT essays have averaged about 400-500 words. We need about 300-350 words from you on any ***ONE*** *of the four topics given below:*

1. 'The **harder the conflict, the more glorious the triumph. What we obtain too cheap, we esteem too lightly.' Thomas Paine**
   The statement above argues that we most value that which is difficult to attain.
   Write an essay supporting the statement and use examples from history, literature, and popular experience to support your position.
2. 'In **crisis is cleverness born' Chinese Proverb**
   The statement above implies crisis can benefit us by fostering creativity. Do you agree? Write an essay using observations and personal experience to support your view.
3. 'Teach **us to give and not to count the cost' Ignatius Loyola.**
   Does cost always mean money? Can it be an act or a gesture or services? What's the best gift you ever received? What's the best gift you have given? How did giving it make you feel? Put your answers together in the form of an essay.
4. 'Don't **look where you fall but where you slipped.' African Proverb.**
   Are there other ways of falling besides losing your balance? (Think of compromising beliefs, homework deadlines, unkept promises) and so on!
   Describe some of your 'falls'. How did you emerge as a better person? Put your views together in an essay.

NOTE : This essay / article will be included in your Internal Assessment CBSE marks.
The Practical component will be partially based on this assignment.

MATHEMATICS

G.D. GOENKA PUBLIC SCHOOL, VASANT KUNJ
HOLIDAY's H.W., 2020-21
CLASS-XII (MATHEMATICS)

Q-1	*Evaluate* $\begin{vmatrix} {}^{m}C_1 & {}^{m}C_2 & {}^{m}C_3 \\ {}^{n}C_1 & {}^{n}C_2 & {}^{n}C_3 \\ {}^{p}C_1 & {}^{p}C_2 & {}^{p}C_3 \end{vmatrix}$.
Q-2	If $A = \begin{bmatrix} 3 & 1 & 2 \\ 3 & 2 & -3 \\ 2 & 0 & -1 \end{bmatrix}$, find A^{-1} Hence, solve the system of equations : 3x + 3y + 2z = 1, x + 2y = 4, 2x−3y−z = 5 .
Q-3	Find the inverse of the following matrix using elementary transformations : $\begin{bmatrix} 2 & -1 & 3 \\ -5 & 3 & 1 \\ -3 & 2 & 3 \end{bmatrix}$.
Q-4	Solve the following system of equations, using matrix method : 5x−y + z = 4, 3x + 2y−5z = 2, x +3y−2z = 5 .
Q-5	Using properties of determinants, prove that $\begin{vmatrix} \frac{(a+b)^2}{c} & c & c \\ a & \frac{(b+c)^2}{a} & a \\ b & b & \frac{(c+a)^2}{b} \end{vmatrix} = 2(a+b+c)^3$.
Q-6	If $p \neq 0, q \neq 0$ and $\begin{vmatrix} p & q & p \propto +q \\ q & r & q \propto +r \\ p \propto +q & q \propto +r & 0 \end{vmatrix} = 0$, then, using properties of determinants, prove that at least one of the following statements is true : (a) p, q, r are in G.P. (b) ∝ is a root of the equation $px^2 + 2qx + r = 0$.
Q-7	If $A = \begin{bmatrix} 2 & 3 & 10 \\ 4 & -6 & 5 \\ 6 & 9 & -20 \end{bmatrix}$, find A^{-1}. Using A^{-1} solve the system of equations $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 2, \frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 5, \frac{6}{x} + \frac{9}{y} - \frac{20}{z} = -4$.
Q-8	If $A = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}$ *and* $B = \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & = 1 & 5 \end{bmatrix}$ are two square matrices, find AB and hence solve the system of linear equations x−y = 3, 2x + 3y + 4z = 17 and y + 2z = 7 .
Q-9	Using properties of determinants, prove that: $\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+3c \end{vmatrix} = a^3$.
Q-10	Given $A = \begin{bmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{bmatrix}, B^{-1} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$, compute $(AB)^{-1}$.
Q-11	Find matrix X so that $X \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} = \begin{bmatrix} -7 & -8 & -9 \\ 2 & 4 & 6 \end{bmatrix}$
Q-12	For what value (s) of x, the matrix product $\begin{bmatrix} 2 & 0 & 7 \\ 0 & 1 & 0 \\ 1 & -2 & 1 \end{bmatrix} \begin{bmatrix} -x & 14x & 7x \\ 0 & 1 & 0 \\ x & -4x & -2x \end{bmatrix}$ equals an identity matrix ?

Q-13	For the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$, verify that $A^3 - 6A^2 + 5A + 11I = O$. Hence find A^{-1}.
Q-14	Prove that $A^n = \begin{bmatrix} 3^{n-1} & 3^{n-1} & 3^{n-1} \\ 3^{n-1} & 3^{n-1} & 3^{n-1} \\ 3^{n-1} & 3^{n-1} & 3^{n-1} \end{bmatrix}$,n ∈ N , if $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$.
Q-15	Using the properties of determinants, prove that : $\begin{bmatrix} a & b-c & c+b \\ a+c & b & c-a \\ a-b & b+a & c \end{bmatrix} = (a+b+c)(a^2+b^2+c^2)$.
Q-16	Using the properties of determinants, prove that : $\begin{bmatrix} a+b+c & -c & -b \\ -c & a+b+c & -a \\ -b & -a & a+b+c \end{bmatrix} = 2(a+b)(b+c)(c+a)$
Q-17	Using properties of determinants, prove that : $\begin{vmatrix} (x+y)^2 & zx & zy \\ zx & (y+z)^2 & xy \\ zy & xy & (z+x)^2 \end{vmatrix} = 2xyz(x+y+z)^3$
Q-18	Two schools P and Q want to award their selected students on the values of Discipline, Politeness and Punctuality. The school P wants to award `x each, `y each and `z each for the three respective values to its 3, 2 and 1 students with a total award money of `1000. School Q wants to spend `1500 to award its 4, 1 and 3 students on the respective values (by giving the same award money for the three values as before). If the total amount of awards for one prize on each value is `600, using matrices, find the award money for each value.
Q-19	Mr. Nakul Saini has invested a part of his income in 10% (bond A) and another part of his income in 15% (bond B). His interest during a certain period is Rs.4000. Had he invested 20% more in bond A and 10% more in bond B, his interest would have been increased by Rs.500 for the same period. Then : (i) Represent the above situation by a matrix equation and form linear equations using matrix multiplication. (ii) Is it possible to solve the system of equations so obtained by matrices? If yes, solve it too.
Q-20	*If* $y = (2x+3)^{(3x-5)}$, *find* $\frac{dy}{dx}$.
Q-21	*Differentiate* $\log \sqrt{\frac{1+\cos^2 x}{(1-e^{2x})}}$ *w.r.t. x.*
Q-22	*If* $y = \sqrt{x^2+1} - \log\left\{\frac{1}{x} + \sqrt{1+\frac{1}{x^2}}\right\}$, *find* $\frac{dy}{dx}$.
Q-23	Differentiate $\sin^{-1}\left(\frac{2^{x+1}}{1+4^x}\right)$ w.r.t. x.
Q-24	Find $\frac{dy}{dx}$ when , $\sin xy + \frac{x}{y} = x^2 - y$
Q-25	If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, then prove that $\frac{dy}{dx} = -\frac{1}{(x+1)^2}$
Q-26	Differentiate $\cos^2 x$ *w.r.t.* $e^{\sin x}$.
Q-27	Find the derivative of the following w.r.t. x , at x=1: $f(x) = \cos^{-1}\left[\sin\sqrt{\frac{1+x}{2}}\right] + x^x$
Q-28	If $= \tan\left(\frac{1}{a}logy\right)$, *then show that* $(1+x^2)\frac{d^2y}{dx^2} + (2x-a)\frac{dy}{dx}$.
Q-29	If $x = acos\theta + bsin\theta$ and $y = asin\theta - bcos\theta$, then show that $y^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = 0$
Q-30	If $x = asin2t(1+cos2t)$ *and* $y = bcos2t(1-cos2t)$, then prove that $\left(\frac{dy}{dx}\right)_{at\ t=\frac{\pi}{4}} = \frac{b}{a}$. Also find the value of $\left(\frac{dy}{dx}\right)_{at\ t=\frac{\pi}{3}}$.

Q-31	If $y = log\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2$, then prove that $x(x+1)^2y_2 + (x+1)^2y_1 = 2$
Q-32	If e^y (x + 1) = 1 , then show that $\frac{d^2y}{dx^2} = \left(\frac{dy}{dx}\right)^2$
Q-33	Find $\frac{d}{dx}\left(\tan^{-1}\frac{4x}{1+5x^2} + \tan^{-1}\frac{2+3x}{3-2x}\right)$.
Q-34	If xcos(a + y) = cosy , then prove that $\frac{dy}{dx} = \frac{cos^2(a+y)}{sina}$. Hence find $\sin a\, y'' + \sin 2(a+y)\, y'$.
Q-35	Find $\frac{dy}{dx}$ if, $y = \sin^{-1}\left[\frac{6x - 4\sqrt{1-4x^2}}{5}\right]$.
Q-36	Find : $\frac{d}{dx}\left[\sec^{-1}\frac{1}{4x^3 - 3x}\right]$
Q-37	Find the derivative of the function $\cos^{-1}\left[\sin\sqrt{\frac{1+x}{2}}\right] + x^x$ w.r.t x, at x=1.
Q-38	Differentiate $x^{x^x} + (logx)^{logx}$ w.r.t. x .
Q-39	If xylog(x + y) = 1 then, prove that : $\frac{dy}{dx} = -\frac{y}{x}\left(\frac{x^2y + x + y}{xy^2 + x + y}\right)$.
Q-40	If $y = \sqrt{x^2+1} - log\left(\frac{1}{x} + \sqrt{1 + \frac{1}{x^2}}\right)$ then, prove that $\frac{dy}{dx} = \frac{\sqrt{x^2+1}}{x}$.
Q-41	*If* $y = (\sin x)^{\tan x} + (\cos x)^{\sec x}$, *find* $\frac{dy}{dx}$.
Q-42	*If* $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \ldots \text{ to } \infty}}}$, *prove that* $\frac{dy}{dx} = \frac{\cos x}{(2y-1)}$.
Q-43	*Differentiate* $\tan^{-1}\left\{\frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}}\right\}$ *w.r.t.* $\cos^{-1}x^2$.
Q-44	If $y = \tan^{-1}\frac{a}{x} + \log\sqrt{\frac{x-a}{x+a}}$, prove that $\frac{dy}{dx} = \frac{2a^3}{(x^4 - a^4)}$.
Q-45	If $y = \sin\left\{2\tan^{-1}\left(\sqrt{\frac{1-x}{1+x}}\right)\right\}$, show that $\frac{dy}{dx} = \frac{-x}{\sqrt{1-x^2}}$.

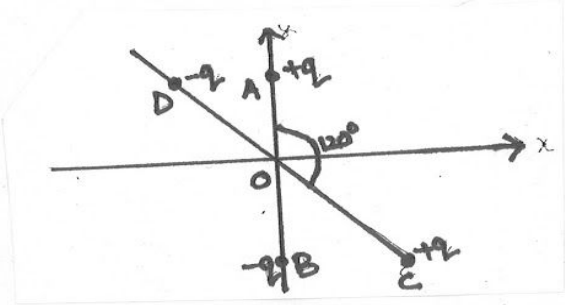
PHYSICS

GENERAL INSTRUCTIONS:

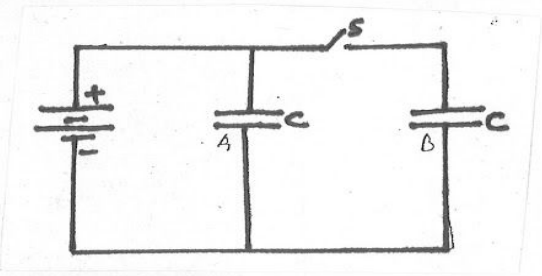
- *Prepare an investigatory project on any topic of your interest related to physics but do get it approved by your teacher. The format will be discussed in the group.This is a part of your board practical schedule.*
- *Complete the NCERT exercise for the first three chapters.*
- *Complete the given worksheet.*

1. If a copper wire is stretched to make it 0.1 % longer, what is the percentage change in its resistance? **[Ans. 0.2 percent]**

2. Two small identical electric dipoles AB and CD, each of dipole moment P are kept at an angle of 120° as shown in figure. What is the resultant dipole moment of this combination? If this system is subjected to electric field (E) directed along + X direction, what will be the magnitude and direction of the torque acting on this?



3. Figure shows two identical parallel plate capacitors connected to a battery with the switch S closed. The switch is opened and the free space between the plates of the capacitors filled with a dielectric of dielectric constant 3. Find the ratio of the total electrostatics energy stored in both capacitors before and after the introduction of the dielectric.

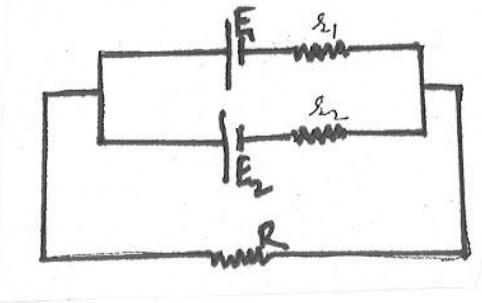


4. Twelve equal wires each of resistance r ohm form a cube. Find the resistance between the diagonally opposite corners. **[Ans. 5/6 rΩ].**

5. A 4 μF capacitor is charged to 200 V supply. It is then disconnected from the supply and is connected to another 2 μF uncharged capacitor. Calculate
   (a) Common potential difference
   (b) Amount of charge that flows to 2 μF
   (c) How much energy of first capacitor is lost in the form of heat and electromagnetic radiation. **[Ans. 2.67×10^{-2} J]**

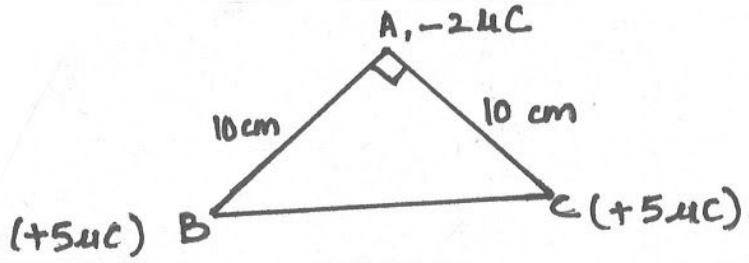
6. Find the emf and the internal resistance of a source which is equivalent to two batteries of emf's E_1 and E_2 and internal resistances r_1 and r_2 connected in parallel, as shown in Fig.

[Ans: $E = E_1r_2 + E_2r_1 / r_1 + r_2$; $r = r_1r_2 / r_1 + r_2$]



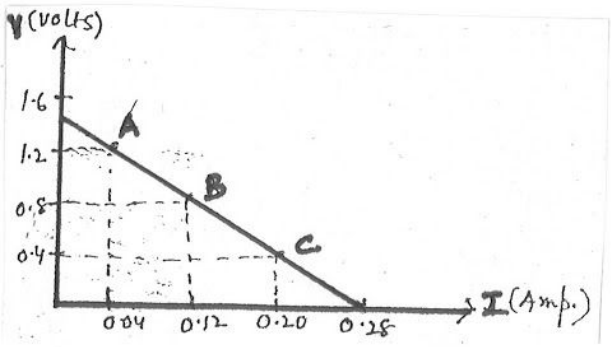
7. Three point charges are located at the corners of an isosceles triangle ABC right angled at A, as shown in figure. (i) Find the magnitude and direction of net force on the charge at C. (ii) What should be the sign and magnitude of the charge to be kept at the mid point of BC so that the charge at A remains at equilibrium.

[8.02N, 52.5^0 : -3.54C}



8. Potential differences across terminals of a cell were measured (in volt) against different currents (in ampere) flowing through the cell. A graph was drawn which was a straight line ABC, as shown in figure below. Determine from the graph
   (a) emf of the cell.
   (b) maximum current obtained from the cell, and
   (c) internal resistance of the cell.

[Ans. (a)1.4V (b)0.28A (C)5Ω]

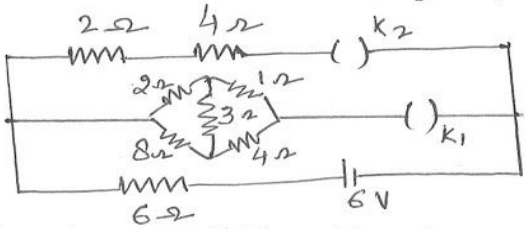


9. In the circuit diagram shown in the figure, Calculate:

(a) The current supplied by the cell and the potential difference between the point A and P, when both the keys K_1 and K_2 are closed

(b) The current supplied when K_1 is closed and K_2 is open.

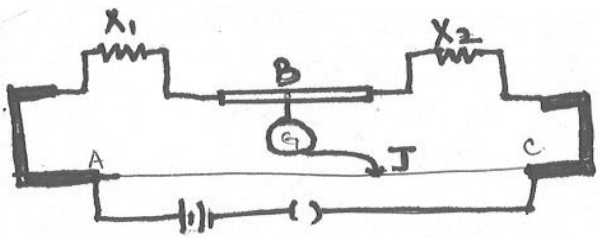
[0.6A, 0.33A]



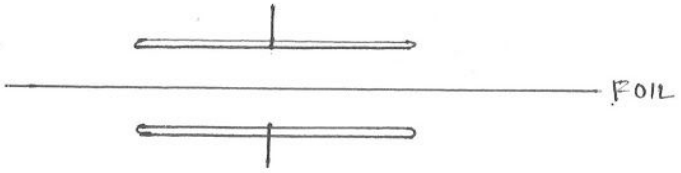
10. In the figure , there is a meter bridge with resistances X_1 and X_2 in the arms AB and BC respectively. A sensitive galvanometer G shows no deflection when movable contact J touches the meter bridge at D such that AD = 40cm.

If resistance X_2 is shunted by a resistance of 30Ω , the null point is found to shift by 10cm. Determine (i) the value of X_1 and X_2 and (ii) position of null point if X_1 was shunted by 30Ω.

[X_1= 10Ω : X_2 = 15Ω : 33.3cm from A]



11. A sheet of aluminium foil of negligible thickness is placed between the plates of a capacitor, as shown in figure below. What effect has it on the capacitance if (i) the foil is electrically insulated, and (ii) the foil is connected to the upper plate with a conducting wire?



12. There are two concentric spheres of radius R and r; R > r. The space between them is filled with a material of Resistivity ρ. Show that the resistance between the two concentric spheres is

$\rho/4\pi\ (1/r - 1/R)$

CHEMISTRY

GENERAL INSTRUCTIONS:

- *One Investigatory project needs to be prepared based on the theory syllabus.*
  - *The project should be self-explanatory housing the most innovative ideas.*
  - *The format of the project should be strictly based on CBSE format.*
- *Complete the practical file records as discussed in the class and leave blank spaces for observations.*
- *Complete the assignment sheet enclosed in a separate folder.*

ASSIGNMENT

1. 3-Bromocyclohexene is more reactive than 4-Bromocyclohexene towards hydrolysis with Aq NaOH. Why?
2. Write the chemical reaction for the preparation of phenol from Cumene.
3. Give the structures of compounds with following IUPAC names:
   - Cyclohexyl methanol
   - 1-Phenylpropan-2-ol
4. Describe the chemical test to distinguish between the following pairs of compounds:
   a. Butan- 2- ol and Butanol
   b. Propanol and phenol
   c. Ethyl methyl ether and propanol
5. Show how you will synthesize the following alcohols from appropriate Alkenes.
   a. Cyclohexyl Butan-2-ol .
   b. 4-Methylheptan-4-ol .
6. Write the mechanism of the reaction of HI with methoxyethane.
7. How will you bring about the following conversions?
   a. Propene to Propyne,
   b. Toluene to Benzyl Alcohol
   c. Butene to iodobutane.
8. (i) o-nitrophenol is steam volatile whereas p-nitrophenol is not. Explain.
   (ii)Phenol is more easily nitrated than benzene. Why?
9. (i)p-nitrochlorobenzene undergoes nucleophilic substitution faster than chlorobenzene. Explain giving the Resonating structures.
   (ii) A hydrocarbon C_4H_8 does not react with chlorine in dark but gives a monochloro compound in the presence of sunlight .Identify the hydrocarbon and write the reaction involved.
10. Account for the following:
    a. Chlorobenzene is deactivated towards electrophilic substitution reaction, yet it is ortho-, para- directing.
    b. Neopentyl bromide undergoes nucleophilic substitution reactions with difficulty.
    c. Phenols cannot be used for preparation of Chlorobenzene with HCl and ZnCl2.

11. Arrange the compounds of each set in increasing order of the property indicated against each set:
    a. Chlorobutane, 2-Methyl-2-Chloro propane, 2-Methyl-1-Chloropropane (Reactivity towards S_N^1)
    b. p-Cresol, o-Cresol, m-Cresol, Phenol (Acidic nature)
    c. Chloroform, Dichloromethane, Carbon tetrachloride. (Dipole Moment)
12. (i) Describe the following in brief:
    a. Sandmeyer reaction.
    b. Swarts reaction
    (ii) The treatment of alkyl chloride with KCN and AgCN, gives different products. Explain.
13. Compound 'A' with molecular formula C_4H_9Br is treated with aq KOH solution.The rate of this reaction depends upon the concentration of the compound 'A' only. When another isomer 'B' of this compound, which is optically active,was treated with aq KOH the rate of reaction was found to be dependent on concentration of compound and KOH both.
    a. Write down the structural formula of both compounds 'A' and 'B'.
    b. What will be the stereochemical aspect of the product formed from compound 'A' and 'B'?
14. Write chemical reaction for the following:
    a. Preparation of 2-methoxy-2-methylpropane by Williamson synthesis.
    b. Reduction of C6H5CH=CHCHO with H2 + Ni .
    c. Bromination of phenol in aqueous solution.
15. A compound 'A' having molecular formula $C_4H_{10}O$ does not react with sodium metal or $KMnO_4$. On heating with excess of HI it gives an alkyl halide only.Deduce the structure of 'A' and write the reactions involved.

BIOLOGY

GENERAL INSTRUCTIONS:

1. *All experiments to be written in the practical file.*
2. *Submit your project (as discussed in the class) in July. The project should be hand written with a case file attached to it.*
3. *The given assignments to be done in the Biology notebook.*

UNIT- 7 : TOPIC –Principles of Inheritance and variation and Mol. basis of inheritance

Very Short Answer Questions [1 mark]

1. What is a Mutagen?
2. What is point mutation? Give an example?

3. Name the event during cell division cycle that results in gain or loss of chromosomes.
4. Why are hnRNA required to undergo splicing?
5. How is the length of DNA calculated?
6. How does HIV differ from bacteriophage?
7. Mention the contribution of genetic maps in the Human genome project?

Short Answer Questions **[2 marks]**

8. State any two differences between male and female heterogamety.
9. Explain pleiotropy with the help of an example?
10. How do histones acquire a positive charge ?
11. State the dual role of Deoxyribonucleotide triphosphate during DNA replication.
12. What is the role of ribosomes in peptide bond formation/How does ATP facilitate it ?
13. Explain the Down syndrome.State its symptoms and cause.
14. Describe the function of the following:
    (i) VNTR (ii) poly -A tail (iii) methylated guanine cap.
15. Draw a labeled diagram of(a) nucleosome(b)Replication fork(c)structure of the transcription unit.
16. Briefly describe polygenic inheritance with the help of suitable examples.
17. Draw a diagrammatic, labeled sketch of a structure of DNA,tRNA, hnRNA, transcription.
18. Explain the following:
    (a) DNA replication is semiconservative.
    (b) Genetic code is unambiguous,universal,contiguous,and degenerative.
    (c) Transformation experiment.
19. Why is tRNA called an adapter molecule?

Long Answer Questions **[5 marks]**

20. Explain Mendel's law of independent assortment by taking a suitable example
21. Explain how did Morgan show the deviation in inheritance pattern in Drosophila with respect to Mendel's law of independent assortment?
22. Draw the structure of the Transcription unit,Explain the function of each component of the unit in the process of transcription .
23. (a) Describe the Griffith series of experiments where he witnessed transformation in bacteria he worked with.
    (b) Write the contribution of Avery ,Macleod and McCarthy to the transforming principle .
24. Draw and explain the Hershey and Chase's experiment that proved that DNA is the hereditary materials

UNIT-6 : TOPIC –Sexual Reproduction in flowering plants

Very Short Answer Questions **[1 mark]**

1. Name the component cell of the 'egg apparatus' in an embryo sac.
2. Which cells degenerate after fertilization in an embryo sac?
3. Name the triploid tissue in the seed.
4. What is self – incompatibility?
5. Which technical term is used for the transfer of pollen grains from the anther of one flower to the stigma of another flower on the same plant?
6. What is the function of germ pore?
7. Banana is a parthenocarpic fruit whereas oranges show polyembryony. How are they different from each other with respect to seeds?

Short Answer Questions **[2 marks]**

8. What is meant by monosporic development of a female gametophyte?
9. What is triple fusion? Where and how does it take place? Name the nuclei involved in triple fusion.
10. Why are pollen grains well preserved as fossils?
11. Draw a labelled diagram of L.S. of an apple.
12. List two strategies that a bisexual chasmagamous flower can evolve to prevent self pollination.
13. Draw a diagram of a typical dicot embryo and label any four parts including the reduced suspensor.
14. Describe in sequence the process of microsporogenesis in angiosperms.
15. Differentiate between:
    (a) Hypocotyl and epicotyl
    (b) Coleoptile and coleorhiza (Perisperm and pericarp)
16. What is meant by emasculation? When and why does a plant breeder employ this technique?
17. How many haploid cells are present in a mature female gametophyte of a flowering plant? Name them.
18. Write the difference between the tender coconut water and the thick, white kernel of a mature coconut and their ploidy.
19. Name the cell from which the endosperm of coconut develops. Give the characteristic features of endosperm of coconut.
20. What is apomixes? How is the phenomenon useful to the farmer?

Long Answer Questions **[5 marks]**

21. With a neat labelled diagram, describe the parts of a mature angiosperm embryo sac. Mention the role of synergids.
22. (a) Explain the process of double fertilization in angiosperms.

(c) List the changes each part of the fertilized ovule undergoes to develop into a seed.

23. (a) With the help of a labelled diagram depict the organization of a typical embryo sac just after double fertilisation.
    (b) How are seeds advantageous to angiosperms?
24. (a)Draw a diagram of a fertilised embryo sac of a dicot flower. Label all its cellular components.
    (b)Explain the development of a mature embryo from this embryo sac.
25. Angiosperm flowers may be monoecious, cleistogamous or show self – incompatibility. Describe the characteristic features of each one of them and state which one of these flowers promotes inbreeding and outbreeding respectively.

UNIT – 8: TOPIC – Microbes In Human Welfare

1. Define biofertilizers.
2. Name the first organic acid produced by microbial fermentation.
3. Which bacterium contains insecticidal crystal protein – thurioside and kills a wide range of insects.
4. What is the botanical name of baker's yeast?
5. Name the group of organisms and the substrate they act on to produce biogas.
6. What are the harmful effects of untreated sewage?
7. What is BOD? What does it mean if a water sample has more BOD?
8. What is the function of an aeration tank in the treatment of sewage?
9. What are the different uses of biogas?
10. Name any two cyanobacteria and explain how they serve as main sources of biofertilizers.
11. How does addition of a small amount of curd to fresh milk help formation of curd? Mention a nutritional quality that gets added to the curd.
12. (a) How does activated sludge get produced during sewage treatment?
    (b) Explain how this sludge is used in biogas production.
13. Name the genus to which baculoviruses belong. Describe their role in the integrated pest management programmes.
14. (a) Why are the fruit juices bought from the market clearer as compared to those made at home?
    (b) Name the bioactive molecules produced by Trichoderma polysporum and Monascus purpureus.
15. During morning walk one day. Hemant asked his uncle, who was a plant pathologist, that he wanted to control pests as these were destroying his garden. But, he did not want to use chemicals due to their long term harmful effect on the environment. His uncle suggested him to go for biological control methods.
    (i) What are biopesticides?
    (ii) Name any biological control agent that helps to control mosquito larvae.

(iii) What value is displayed by Hemant?

TOPIC – Strategies For Enhancement In Food Production

1. What is gene pool?
2. Define the terms – (a) somatic embryo and (b) somatic hybrids.
3. What is totipotency?
4. Name two plants which have been produced by artificial selection.
5. What is emasculation?
6. List any two economically important products for humans obtained from Apis indica.
7. Write the importance of MOET.
8. What is selection? Name the two methods of selection.
9. What are intervarietal and interspecific hybridizations?
10. Give a brief account of micropropagation.
11. What is meristem culture?
12. What is aquaculture? Give the example of an animal that can be multiplied by aquaculture.
13. What is meant by germplasm collection? What are its benefits?
14. Write an explanatory note on single cell protein.
15. Write a note on apiculture.
16. What is the meaning of sterilization? Why sterilization is essential in tissue culture and recovery of complete plants.
17. Explain the efforts which must be put into improving the health, hygiene and milk yield of cattle in a dairy farm.
18. (a) Explain how to overcome inbreeding depression in cattle.
    (b) list three advantages and one disadvantage of cattle.
    (c)Name an improved breed of cattle.
19. Rohit was a milkman. Once, he asked his father that he has heard about high milk yielding cows but has no idea from where he can procure such a variety of cow. Rohit's father, being an agricultural scientist, solved his son's problem.
    Read the above passage and answer the following questions:
    (a) What is artificial insemination?
    (b) Name two superior varieties of cows.
    (c) How did his father help his son Rohit?

TOPIC – Human Health And Disease

1. Name the causative organism of following diseases?
2. What are the symptoms of the following diseases?
3. What causes chills in malarial?
4. Give an example of Primary lymphoid organs?
5. Expand the term AIDS.
6. What is the causative organism of AIDS?

7. What is the mode of HIV infection?
8. What is the diagnostic test for AIDS?
9. Expand the terms – NACO, NGO, WHO.
10. Which of the following is passive immunity and why? Natural infection, vaccine, mother colostrums.
11. Classify lymphoid organs on the basis of the maturation and proliferation of lymphocytes.
12. What are lymph nodes? What is their role?
13. What are carcinogens? Give examples.
14. How is biopsy done?
15. Write a short not on the following diseases their causative, symptoms and mode of transmission.
    (i) Malaria
    (ii) Typhoid
    (iii) Amoebiasis
    (iv) Elephantiasis
16. Distinguish between the following
    (i) Primary response and secondary response
    (ii) B – Lymphocytes and T – lymphocytes
    (iii) Active and passive immunity
17. Complete the following table

S.No.	Disease	Causative	Symptoms
(i)	Ascariasis	A	Internal bleeding and muscular pain
(ii)	B	C	Inflammation and severe swelling in one of lower limbs
(iii)	Amoebiasis	D	e
(iv)	F	Microsporum	g

18. Complete the following table.

S.No.	Disease	Causative	Symptoms
(i)	Typhoid	a	Sustained high fever
(ii)	b	c	Fever with chills
(iii)	Cold	d	Sore throat and cough
(iv)	e	Plasmodium vivax	f
(v)	g	Entamoeba	Stools
(vi)	Ascariasis	Ascaris	b
(vii)	i	Wuchereria	j
(viii)	k	Trichophyton	Itching, dry skin

ECONOMICS

Please follow the guidelines enlisted below for the project work which you have to do for the Board Examination 2020-21. Do carry out research, read extensively, explore and think 'out of the box' to make your project unique and more meaningful.

The project will give you added benefit and required exposure for university admissions too. You will be evaluated out of 20 marks for these project files and a viva

Good Luck to you!! Happy Holidays

Stay healthy and be safe.

GUIDELINES FOR PROJECT WORK

At the end of the stipulated session, each student will present the work in the Project File (with viva voice) to the External examiner.

DATE OF SUBMISSION: 10 JULY 2020

The expectations of the project work are that:

- Learners will complete only ONE project in each academic session
- Project should be of 3,500-4,000 words (excluding diagrams & graphs), preferably hand-written
- It will be an independent, self-directed piece of study
- Scope of the project: Student may work upon the following lines:
    - Content/Index
    - Acknowledgement
    - Certificate
    -

Students are supposed to pick any ONE of the suggested projects.

1. Micro and Small Scale Industries
2. Impact of COVID-19 on the Indian Economy
3. Impact of Coronavirus Outbreak on the global economy
4. Cyber-crime and its impact on Indian Economy
5. Disinvestment policy of the government
6. Make in India – The way ahead
7. Sarva Siksha Abhiyan – Cost Ratio Benefits
8. Government Budget & its Components
9. Golden Quadrilateral- Cost ratio benefit
10. Organic Farming – Back to the Nature
11. Currency War – reasons and repercussions
12. Monetary policy in India
13. Foreign Exchange Rate
14. Digital India- Step towards the future
15. Waste Management in India – Need of the hour

16. Foreign Direct Investment in India –" First Develop India"
17. Role of RBI in Control of Credit
18. Medical Tourism in India
19. Rural Credit –Analysis of Credit Facilities to Small Scale Farmers
20. Impact of Information Communication Technology (ICT) on Economic Development of India
21. Green Revolution: Making India Self Sufficient in Food
22. Critical analysis of New Economic Policy in 1991
23. Indian Economy- Then and Now (1947-2019)
24. Comparative Development Experiences of India and its Neighbours
25. Inflation in India – reasons and repercussions
26. Environment and Sustainable Development
27. Oligopoly-cellular networks industry with emphasis on the price wars started by reliance JIO
28. Venezuelan crisis
29. Oil price instability and balance of payment situation 2004–2016
30. The impact of cashless policy on the economic growth of India
31. Special economic zones
32. Start-up India and its impact

Following essentials are required to be fulfilled in the project.

Cover page (Topic Name, Picture related to project, Name of the Students, Board Roll No. Academic year 2020-2021)

- Introduction
- Details of the topic
- Pros and Cons of the economic event/happening.
- Major criticism related to the topic (if any)
- Students' own views/perception/ opinion and learning from the work
- Any other valid idea as per the perceived notion of the student who is actually working and presenting the Project-Work.
- Case Study
- Bibliography
- About Student

Arrange a presentation of the project file

PSYCHOLOGY

1. **CASE STUDY FILE**

Case study is an in-depth analysis of a person. You are required to choose a person on whom you want to do your case study. The person should be 16-18 years of age and willing to cooperate with you.

TOPICS TO BE COVERED IN FILE WORK

- Introduction
- Methods used for psychological assessment
- Problems faced during adolescence
- Psychological tools
- Case history
- Physical health
- Non participant observation
- Interviews – with mother, sibling, teachers, best friend and with the subject

2. **PRACTICAL FILE**

Complete writing the following in the practical file :

a. Raven's Standard Progressive Matrices
b. Maudsley's Personality Inventory
c. Global Adjustment Scale
d. Self Concept Questionnaire
e. Sodhi's Attitude Scale

3. **In school register complete the question answers of chapters 1,2,3 and 4 (given at the end of each chapter in NCERT book).**
4. **Watch any film depicting a psychological disorder/ learning disability.** (Recommended movies – Karthik Calling Karthik, My Name Is Khan, Taare Zameen Par, Rain man, Beautiful Mind, As Good As It Gets, Dear Zindagi etc.).

COMPUTER SCIENCE

GENERAL INSTRUCTIONS:

- *Write the solutions of the following questions in a google doc.*
- *The name of the google doc should be Holidays_Task_2020*
- *Share the link in the Google Classroom*

1.	Explain the following terms in RDBMS: I. Tuple II. Degree III. Attribute IV. Cardinality

	V. Domain VI. Primary Key VII. Foreign Key VIII. Unique Key IX. Composite Key X. Alternate Key XI. Candidate Key XII. Cartesian Product
2.	Consider the following tables and answer a) and b) parts of this question: Table : Company **CID** | **NAME** | **CITY** | **PRODUCTNAME** 111 | SONY | DELHI | TV 222 | NOKIA | MUMBAI | MOBILE 333 | ONIDA | DELHI | TV 444 | SONY | MUMBAI | MOBILE 555 | BLACKBERRY | MADRAS | MOBILE 666 | DELL | DELHI | LAPTOP Table : Customer **CUSTID** | **NAME** | **PRICE** | **QTY** | **CID** 101 | Rohan Sharma | 70000 | 20 | 222 102 | Deepak Kumar | 50000 | 10 | 666 103 | Mohan Kumar | 30000 | 5 | 111 104 | Sahil Bansal | 35000 | 3 | 333 105 | Neha Soni | 25000 | 7 | 444 106 | Sonal Aggarwal | 20000 | 5 | 333 107 | Arjun Singh | 50000 | 15 | 222
2 a)	i) To add one more column “total_price” of type float to the table customer.
	ii) To display those company names which are having price less than 30000.
	iii) To reduce the price by 10% if the quantity purchased is more than 10.
	iv) To display the name of the companies in reverse alphabetical order.
	v) To display Company ID, its name and the name of the customer if the quantity purchased is more than 10.
	vi) To display the total quantity purchased from each Company.
	vii) To insert a tuple in the table Customer.
	viii) To display the details of the customers according to quantity purchased in

	descending order and within that price in ascending order.
	ix) To display the Customer ID, Name and the City from where the purchasing is done.
	x) To display the number of unique products from the table Company.
2 b)	Find the output: [Note : Please consider the original tables for finding the output given above]
	i) SELECT PRODUCTNAME, CITY, PRICE FROM COMPANY, CUSTOMER WHERE COMPANY.CID = CUSTOMER.CID AND PRODUCTNAME = ”MOBILE”;
	ii) SELECT AVG(QTY) FROM CUSTOMER WHERE NAME LIKE “%r%;
	iii) SELECT MIN(PRICE), MAX(PRICE) FROM CUSTOMER WHERE QTY>10 ;
	iv) SELECT COUNT(*) ,CITY FROM COMPANY GROUP BY CITY;
3.	Differentiate between DDL and DML commands.
4.	Explain any four options available with Alter table command.

INFORMATICS PRACTICES

GENERAL INSTRUCTIONS:

- *Write the answers of the following questions in your register.*
- *Perform the SQL programming questions on your computer and then write the solutions.*

1. Draw and compare various types of networking topologies.
2. Mention the Various types of Networks. Explain each with its advantages and limitations.
3. A company has 3 departments namely Administrative, Sales, Production. Out of telephone cable, Optical Fiber, Ethernet Cable, which communication medium is best for high speed communication between departments ?
4. Identify the following devices :
   a. An intelligent device that connects several nodes to form a network and redirects the received information only to intended node(s).
   b. A device that regenerates (amplifies) the received signal and re-transmits it to its destination.
   c. What is the name of the network topology in which each node is connected independently using a switch ?

5. What is the purpose of SQL?
6. State difference between date functions NOW( ) and SYSDATE( ) of MySql.
7. How is the ALTER table statement different from an UPDATE statement?
8. Mr. Manav, a database administrator in "Global Educational and Training Institute" has created following table named "Training" for the upcoming training schedule:

Training

Training_Id	Name	Email_Id	Topic	City	Fee
ND01	Mr. Rajan	raj@gmail.com	Cyber Security	New Delhi	10000
GU01	Ms. Urvashi	urv@yahoo.com	ICT in Education	Gurugram	15000
FD01	Ms. Neena	neenarediff.com	Cyber Security	Faridabad	12000
ND02	Mr. Vinay	NULL	ICT in Education	New Delhi	13000
GU02	Mr. Naveen	nav@gmail.com	Cyber Security	Gurugram	NULL

   a. Help him in writing SQL query for the following purpose:
      i. To count how many female candidates will be attending the training.
      ii. To display a list of free trainings.
      iii. To display all the cities where Cyber Security training is scheduled along with its fee.
      iv. To add column feedback with suitable data type.

   b. Observe the table named "Training" given above carefully and predict the output of the following queries:
      i. Select city from training where topic = 'Cyber Security';
      ii. Select count(Training_Id) from training where email_id like '%gmail% ';
      iii. Select AVG (Fee) from training where Topic = 'Cyber Security';
      iv. Select name from training where INSTR (Email_Id, '@')=0;
      v. What is the degree and cardinality of the above given table named 'Training'.

9. In a Bank's database, there are two tables 'Customer' and 'Transaction' as shown below.

Customer

Acc_No	Cust_Name	Cust_City	Cust_Phone	Open_Bal
2101001	Sunita	Ambala	9710557614	10000
2201002	Sandhya	Patna	8223545233	15000
2301003	Vivek	New Delhi	9972136576	13000
2401004	Meena	New Delhi	9321305453	10000

Transaction

Trans_Id	Acc_No	Transaction_Type	Amount
Tr001	2301003	Credit	15000
Tr002	2201002	Credit	20000
Tr003	2101001	Debit	3500
Tr004	2301003	Credit	26000
Tr005	2301003	Credit	24000

a. Consider these tables while attempting the questions given below:
   i. Identify the candidate keys of the Customer table.
   ii. Briefly explain the concept of Candidate keys.
   iii. Which column can be considered as foreign key column in the Transaction table?
   iv. Identify Primary Key column of Transaction table.

b. With reference to the above given tables, attempt the questions given below:
   i. Write a query to display the customer's name who has withdrawn the money.
   ii. Write a query to display the customer's name along with their transaction details.
   iii. Write a query to display customer's names who have not done any transaction yet.
   iv. How many rows and columns will be there in the Cartesian product of the above given tables.
   v. Mention the degree and cardinality of the Cartesian product of the above given tables.
   vi. Select Acc_No, sum(Amount) from Customer c, Transaction t where c.Acc_No=t.Acc_No group by c.Acc_No having Transaction_Type="Credit";
   vii. Discuss the significance of having a clause with a group by statement with suitable Example.

10. Write the output of the following SQL queries :
    a. SELECT RIGHT('software', 2);
    b. SELECT INSTR('twelve','lv');
    c. SELECT DAYOFMONTH('2014-03-01');
    d. SELECT ROUND(76.987, 2);