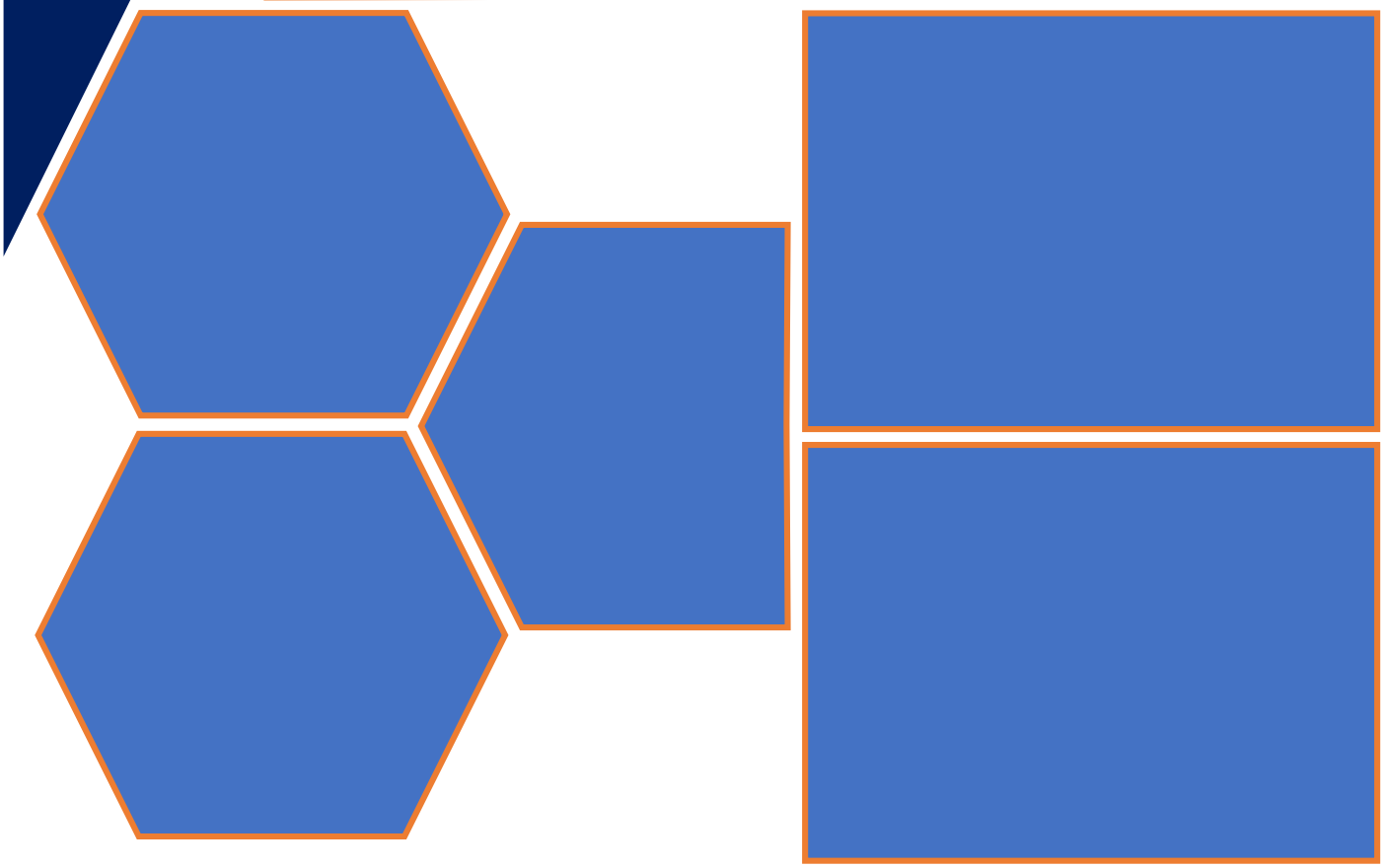
SHREE VASISHTHA VIDHYALAYA

CBSE – ENGLISH MEDIUM

2023-24

SUMMER ASSIGNMENT

CLASS – XII Science



Summer Assignment

Dear Students,

Greetings!

"Searching and learning is where the miracle process all begins". - Jim Rohn

Vacation is just one letter different than vocation. Summer vacation is the time when you can be more candid and creative with your studies. This is the time when intellectual and other skills can be nurtured and developed. Keeping the same thought these Holiday assignments are designed by your mentors to help you stay in touch with the concepts you've learned, to explore new skills and be creative in presentation.

Here are some ways by which you can make your holidays fun and productive.

- Read a newspaper daily. Explore some good books preferably related to the field you wish to pursue in future.
- Play indoor games like Ludo, carom board, scrabble, chess etc.
- Help your parents in small household chores like cleaning the cupboards, watering the plants, making the bed, etc.
- Complete the Holiday Home Work as per the instructions given.
- Most importantly: Limit your screen time.

Have an enjoyable Summer Vacation. Stay Safe.

Regards,

Dr. A. K. Gaur
Advisor

Ms. S. Srivastava
Principal

SUMMER ASSIGNMENT: 2023-24
Class: XII (Science Stream)

General Instructions:-

1. **All the subject assignments have to be done in separate files using project papers.**
2. **Submission date:- 14th June, (Wednesday)**
3. **The Summer Break is scheduled from 07th May 2023 – 11th June, 2023. The students will resume the school from 12th June, 2023.**

Note:- These assignments are a part of your internal assessment & will be marked accordingly out of 10.

ENGLISH CORE (301)

I. Read the passage given below and answer the questions that follow:

1. Twenty-six-year-old Verhaen Khanna is not your garden variety green crusader. He's on a mission to cure 'tree blindness'- the habit of not looking at trees. "People just walk past them," he complains, at his New Friends Colony residence office, clad in Batman pajamas and bathroom slippers. Khanna, as part of New Delhi Nature Society which he set up last year, is educating Delhiites about trees in a unique way- by teaching them how to climb them.

2. A generation ago, the practice was commonplace but with today's increasingly indoor living, learning to scale the neem next door sounds like a spot of daredevilry. Anuj Wadhwa, a 26-year-old garment exporter learnt to shimmy up trees a few months ago. "Spending time with nature and climbing trees become a spiritual exercise for me. Once you're in a tree, you become part of its ecosystem, which includes birds, insects, fruits and flowers," says Wadhwa who can spend 40-45 minutes hanging out on tree branches, sometimes with a cup of green tea in hand.

3. But it's all about barking up the right tree. "It depends on how and where you sit," Khanna points out. "You have to find a cosy nook, maybe a Y-or a V-shaped branch. Find a hook to rest your arm. Or, you can lie down. It can get so comfortable that I have to warn people from falling off to sleep." A trained commercial pilot, Khanna organises periodic campouts around Delhi - Jahanpanah city forest near GK-II, Asola Sanctuary, Lodhi Garden, Nehru Park, colony parks in New Friends Colony, Maharani Bagh, GK-I etc.- where he not only teaches members how to climb trees, but also to make a fire, count GPS satellites and stars.

4. While Khanna provides tents and other equipment on these free jaunts, participants must bring their own food. The tree-lover funds his woody ambitions with his day job as business developer, and as a light painting artist at OLE India- a collaborative of professionals and free thinkers. He has also uploaded tree-climbing tutorials on YouTube. When climbing a straight trunk (coconut or palm), ascend using both arms in tandem (like in a hug) instead of alternating them. But banyan trees, with thick, low lying branches and vines offer a relatively easy climb.

5. Anyone can join NDNS and it's free. The year-old society has been attracting members through word of mouth and sight- the image of men and women sitting atop trees in various city parks. Khanna has organized six outdoor camps in the past year and has taught around 30 people to climb trees. Once up, he briefs participants about the tree and its ecosystem. Details like what kind of fruit and flower it bears, their benefits, the shape and size of leaves, kinds of insects, birds and squirrels living on it, any folk tales associated with it are discussed and shared. Khanna says books, internet and hands-on experience working on farms is the source of his tree knowledge.

6. Tarun Mal, an agriculturist who lives in Gurgaon and runs a farm in Alwar, says the first time he climbed, he feared falling. "But once you're inside the canopy, it's a different world and you don't want to come down," he says. For Masrat Khan, a communication expert, the experience brings out the child in her. When not scaling trees, NDNS members are busy doing "guerilla gardening"-planting hardy local tree varieties like neem, babul and jamun wherever possible and often without permission. Their mission to cure tree blindness continues.

On the basis of your understanding of the passage answer the following questions with the help of the given options:

1) Verhaen Khanna is on a mission to cure

i. Night blindness
ii. Tree blindness
iii. Colour blindness
iv. Short sightedness

2) Spending time with nature and climbing trees has become a

i. spiritual exercise
ii. physical exercise
iii. aerobic exercise
iv. All the above

3) When climbing a straight trunk use

i. both arms in tandem
ii. both legs in tandem
iii. both arms and legs in tandem
iv. alternate arm and leg in tandem

4) When not scaling trees, NDNS members are busy doing

i. Tree Gardening
ii. Flower Gardening
iii. Guerrilla Gardening
iv. recruiting new members

5) Khanna is professionally a

i. tree climber
ii. businessman
iii. commercial pilot
iv. botanist

6) In addition to tree climbing what other activities does Khanna promote?

i. To make a fire, count GPS satellites and stars.
ii. To play outdoor games
iii. To read
iv. To plant trees

7) What education is being imparted to Delhiites by Verhaen Khanna?

i. is educating Delhiites about trees in a unique way- by teaching them how to do farming
ii. is educating Delhiites about trees in a unique way- by teaching them how to climb them
iii. is educating them to gain good knowledge about environment
iv. is educating them to gain good knowledge about environment through higher education

8) What is Anuj Wadhwa's opinion about nature and climbing trees?

i. It's an exciting experience
ii. It's always a great experience to feel relaxed
iii. It's a spiritual experience
iv. It's a wastage of time

9) What varieties of trees are planted by the NDNS members?

i. like neem, babul and jamun wherever possible
ii. Foreign varieties
iii. Regional varieties
iv. None of the above

10) Find words from the passage which mean the same as:

a) Biological environment (Para 2, 5)

i. Ecosystem
ii. Nature
iii. Ecological balance
iv. Biodiversity

11) Find words from the passage which mean the same as:

a) Excursion (Para 4)

i. Jaunts ii. Tutorials iii. Trips iv. Ambitions

II. Answer the following questions in 40-50 words each:

1) "This is your last French lesson." How did Franz react to this declaration of M.Hamel?
2) Is it possible for Mukesh to realize his dream? Justify your answer?
3) Why did Kamala Das add the image of merry children to her poem?
4) Why did the booking clerk refuse to accept the money in third level?
5) What sort of hunts did the Maharaja offer to organize for the high-ranking British officer? What trait of the officer does it reveal?

III. Answer the following questions in 120-150 words each:

1) Everybody during the last lesson is filled with regret. Comment.
2) What change did Anees Jung see in Saheb when she saw him standing by the gate of the neighborhood club?
3) Why does Kamala Das compare her mother to a late winter's moon?

4) What is a first day cover? What is being inferred from Sam's letter to Charley?
5) The astrologer's prediction about the death of the Tiger King came to be true. Do you agree with this statement? Explain why or why not.

IV. Attempt the following questions:

1) You are Amar/Amrita, Secretary, Cultural Club, Aryamba Public School, Kochi. A charity show has been arranged in your school in aid of cancer patients. Write a notice to be displayed on the school notice board informing the students of the show and asking them to cooperate and make it a success. Draft the notice in about 50 words giving all necessary details.
2) Water supply will be suspended for eight hours (10 am to 6 pm) on 6th of March for cleaning of the water tank. Write a notice in about 50 words advising the residents to store water for a day. You are Karan Kumar/Karuna Bajaj, Secretary, Janata Group Housing Society, Palam Vihar, Kurnool.
3) You are Navid/Nafeesa of 10, Nehru Nagar, Ahmedabad. The 60 – foot wide main road in Nehru Nagar Market remains congested throughout the day, because of massive encroachments on both sides of the road, causing a lot of inconvenience to pedestrians, especially children and women. Write a letter to the editor of a national daily requesting him to highlight the problems faced by the residents, giving concrete suggestions for improving the situation.
4) Lack of job opportunities in rural areas is forcing people to migrate to cities. Every big city thus has a number of slums in it. Life in these slums is miserable. Write a letter in 120 – 150 words to the editor of a national newspaper on how we can improve the living conditions in these slums. You are Karan/Karuna, M114, Mall Road, Delhi.

PHYSICS (042)

Q1. Two charges of equal magnitudes and at a distance r exert a force F on each other. If the charges are halved and distance between them is doubled, then the new force acting on each charge is _____.

(a) F/8 (b) F/4 (c) 4F (d) F/16

Q2. A particle of mass m and charge q is placed at rest in a uniform electric field E and then released, the kinetic energy attained by the particle after moving a distance y, will be

(a) q^2Ey (b) qEy (c) qE^2y (d) qEy^2

Q3. A charge Q is enclosed by a Gaussian spherical surface of radius R. If the radius is doubled, then the outward electric flux will

(a) Increases 4 times (b) Be reduced to half
(c) Remains the same (d) Be doubled

Q4. In a certain region, a uniform electric field exists along X-direction. The equipotential surfaces associated with this field will be

(a) Equidistant planes parallel to YZ-plane
(b) Equidistant planes parallel to XY-plane
(c) Equidistant planes parallel to XZ-plane
(d) Coaxial cylinders of increasing radii around the X-axis

Q5. 8 drops of Hg are combined to form a bigger single drop. The capacitance of a single small drop and that of the single big drop will be in the ratio of

(a) 1:2 (b) 1:8 (c) 8:1 (d) None of these

Q6. The insulation property of air breaks down at $E=3x10^6$ V/m. The maximum charge that can be given to a sphere of diameter 5 m is approximately (in coulomb)

(a) $2x10^{-2}$ (b) $2x10^{-3}$ (c) $2x10^{-4}$ (d) $2x10^{-5}$

Q7. The ratio of masses of three wires is 1:2:3 and that of their lengths is 3:2:1. If the wires are made of same material, the ratio of their resistances will be

(a) 1:1:1 (b) 1:2:3 (c) 9:4:1 (d) 27:6:1

Q8. A cell of internal resistance r connected across an external resistance R can supply maximum current when

(a) R = r (b) R > r (c) R = 2 r (d) R = 0

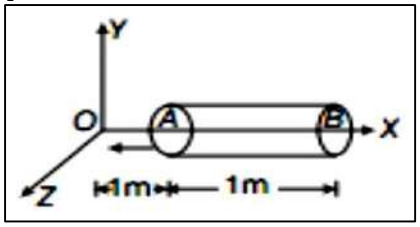
Q9. The element of a heater is rated (P, V). If it is connected across a source of voltage 2 V , then the power consumed by it will be

(a) P (b) 2P (c) P/2 (d) P/4

Short/long answer questions

Q10. Two concentric metallic spherical shells of radii R and 2R are given charge Q_1 and Q_2 respectively. The surface charge densities on the outer surfaces of the shells are equal. Determine the ratio $Q_1 : Q_2$

Q11. A hollow cylindrical box of length 1 m and area of cross section 25 cm^2 is placed in a three dimensional co-ordinate system as shown in fig. The electric field in the region is given by $\vec{E} = 50x\hat{\imath}$, where E is in N/C and x is in metre.



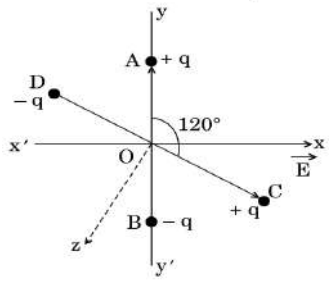
Find: (i) Net flux through the cylinder
(ii) Charge enclosed by the cylinder.

Q12. The magnitude of electric field (in N/C) in a region varies with the distance r $(in\ cm)$ as $E = 10r + 5$ by how much does the electric potential increase in moving from point at $r = 1\ m$ to a point at $r = 10m$?

Q13. Five thousand lines of force enter a certain volume of space and three thousand lines emerge from it. What is the total charge in coulomb within this volume?

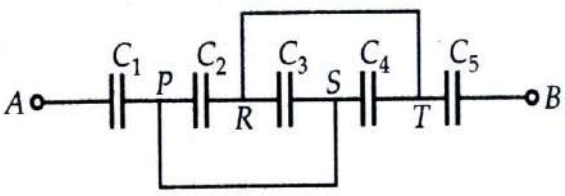
Q14. Define the term 'mobility' of charge carriers in a current carrying conductor. Obtain the relation for mobility in terms of relaxation time.

Q15. Two small identical electric dipoles AB and CD, each of dipole moment → p are kept at an angle of 120° to each other in an external electric field → E pointing along the x-axis as shown in the figure. Find the (a) dipole moment of the arrangement, and (b) magnitude and direction of the net torque acting on it



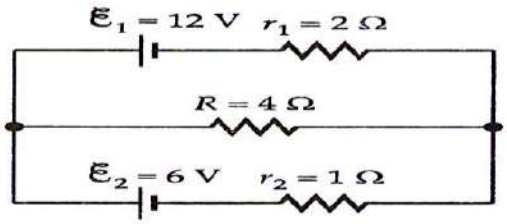
Q16. (i) Find equivalent capacitance between A and B in the combination given below. Each capacitor is of 2 μF capacitance.

(ii) If a dc source of 7 V is connected across AB, how much charge is drawn from the source and what is the energy stored in the network?



Q17. Plot a graph showing the variation of current density (j) versus the electric field (E) for two conductors of different materials. What information from this plot regarding the properties of the conducting material, can be obtained which can be used to select suitable materials for use in making (a) standard resistance and (b) connecting wires in electric circuits?

Q18. Find the potential difference across each cell and the rate of energy dissipation in R.



Q19. Differentiate between the random velocity and the drift velocity of electrons in an electrical conductor. Give their order of magnitudes.

A conductor of uniform cross-sectional area is connected across a dc source of variable voltage. Draw a graph showing variation of drift velocity of electrons (vd) as a function of current density (J) in it.

Q20. Differentiate between electrical resistance and resistivity of a conductor.

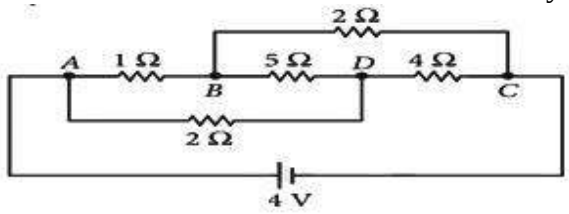
Two metallic rods, each of length L, area of cross A1 and A2, having resistivities ρ1 and ρ2 are connected in parallel across a d.c. battery. Obtain the expression for the effective resistivity of this combination.

Q21. An electric dipole of length 4 cm when placed with its axis making an angle of 60° with a uniform electric field, experiences a torque of 4 3 N-m. Calculate the potential energy of the dipole if it has a

charge of ± 8 nC

Q22. Two cells, of emf $2E$ and E, and internal resistance $2r$ and r respectively, are connected in parallel. Obtain the expression for the equivalent emf and the internal resistance of the combination.

Q23. Calculate the current drawn from the battery by the network of resistors shown in the figure

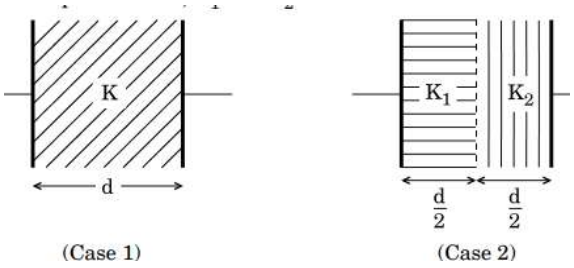


Q24. The electric field in a certain region of space is $5\hat{\imath} + 4\hat{\jmath} - 4\hat{k}\ N/C$. Calculate electric flux due to this field over an area of $2\hat{\imath} - \hat{\jmath}\ m^2$.

Q25. Draw equipotential surfaces for

i. Positive point charge
ii. Electric dipole
iii. Two equal positive charges
iv. Uniform electric field

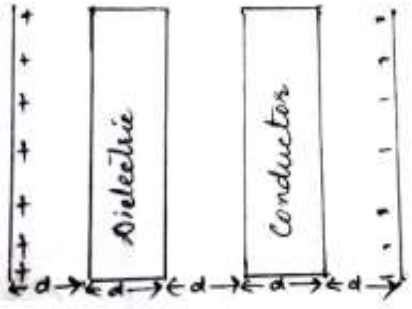
Q26. The space between the plates of a parallel plate capacitor is completely filled in two ways. In the first case, it is filled with a slab of dielectric constant K. In the second case, it is filled with two slabs of equal thickness and dielectric constants K_1 and K_2 respectively as shown in the figure. The capacitance of the capacitor is same in the two cases. Obtain the relationship between K, K_1 and K_2.



Q27. Compare the individual dipole moment and the specimen dipole moment for H_2O molecule and O_2 molecule when placed in

(i) Absence of external electric field.
(ii) Presence of external electric field. Justify your answer.

Q28. Given two parallel conducting plates of area A and charge densities $+\sigma$ & $-\sigma$. A dielectric slab of constant K and a conducting slab of thickness d each are inserted in between them as shown. (i) Find the potential difference between the plates. (ii) Plot E versus *x* graph, taking $x = 0$ at positive plate and $x = 5d$ at negative plate.



CHEMISTRY (043)

Q1. The experimental molecular weight of an electrolyte will always be less than its calculated value of Van't Hoff factor, 'i' is:

(a) Greater than 1 (b) Less than 1 (c) One (d) Zero

Q2. If α is the degree of dissociation of K_2SO_4, the van't Hoff factor (i) used for calculating the molecular mass is

(a) 1 - 2 α (b) 1 + 2 α (c) 1- α (d) 1 + α

Q3. The porous membrane used in reverse osmosis plant is made up by

(a) Cellulose acetate (b) Potassium nitrate
(c) Mercuric iodide (d) Starch

Q4. If two substances A and B have $P^0_A : P^0_B = 1 : 2$ and have mole fraction in solution 1 : 2, then mole fraction of A in vapours is

(a) 0.33 (b) 0.25 (c) 0.52 (d) 0.2

Q5. If molality of the dilute solution is doubled, the value of the molal depression constant will be

(a) doubled (b) halved (c) tripled (d) unchanged

Q6. In a lead storage battery, the electrolyte H_2SO_4 solution is

(a) 38% (b) 62% (c) 80% (d) 48%

Q7. The emf produced by a voltage cell is

(a) Electrode potential (b) Reduction potential

(c) Cell potential (d) Oxidation potential

Q8. The cell constant of a conductivity cell

(a) Changes with change in concentration of electrolyte
(b) Changes with the nature of electrolyte
(c) Changes with change in temperature of electrolyte
(d) Remains constant for a cell.

Q9. When initial concentration of reactant is double in a reaction, the half-life period is not affected. The order of reaction is

(a) Second (b) Zero

(c) First (d) More than zero but less than first

Q10. The first order rate constant for the decomposition of N_2O_5 is 6.2×10^{-3} sec^{-1}. The $t_{1/2}$ of the decomposition

(a) 117.7 sec (b) 111.7 sec (c) 228.4 sec (d) 168.9 sec

Q11. Gases tend to be less soluble in liquids as the temperature is raised. Why?

Q12. What is reverse osmosis? Give one large scale use of it.

Q13. What is a semi permeable membrane?

Q14. Under what condition is van't Hoff factor less than one?

Q15. Why is glycol and water mixture used in car radiators in cold countries?

Q16. Given reason for the following :–

(a) Aquatic species are more comfortable in cold waters than in warm waters.

(b) To avoid bends scuba divers use air diluted with helium.

(c) Cold drinks bottles are sealed under high pressure of CO_2.

Q17. For a dilute solution containing 2.5 g of a non-volatile non-electrolyte solute in 100 g of water, the elevation in boiling point at 1 atm pressure is 2°C. Assuming concentration of solute is much lower than the concentration of solvent, determine the vapour pressure (mm of Hg) of the solution.

Q18. Osmotic pressure of a 0.0103 molar solution of an electrolyte was found to be 0.75 atm at 27°C. Calculate Van't Hoff factor.

Q19. What is meant by cell constant?

Q20. Define the term molar conductivity.

Q21. Which type of cell is lead storage battery? Write its electrode reaction.

Q22. Which type of cell is mercury cell? Write its electrode reaction.

Q23. Calculate the equilibrium constant for the reaction

$Cu(s) + 2Ag^+(aq) \rightarrow Cu^{2+} + 2Ag(s)$ $\quad E^0_{cell}=0.46$ V.

Q24. The standard electrode potential for Daniell cell is 1.1 V. Calculate the standard Gibbs energy for the reaction:

$Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$

Q25. What do you understand by rate of a reaction?

Q26. Distinguish between order and molecularity of a reaction.

Q27. Rate of a reaction is given by the equation: Rate = $[A]^2[B]$.

What are the units for the rate and rate constant for this reaction?

Q28. Name the factors on which the rate of a particular reaction depends.

Q29. The rate constant for a first order reaction is 60 s^{-1}. How much time will it take to reduce the initial concentration of the reactant to its 1/16th value?

Q30. During nuclear explosion, one of the products is ^{90}Sr with half-life of 28.1 years. If 1μg of ^{90}Sr was absorbed in the bones of a newly born baby instead of calcium, how much of it will remain after 10

years and 60 years if it is not lost metabolically.

MATHEMATICS (041)

Q1. The mapping $f: N \rightarrow N$ given by $f(n) = 1 + n^2, n \in N$ when N is the set of natural numbers, is

(a) one-one and onto (b) onto but not one-one

(c) one-one but not onto (d) neither one-one nor onto

Q2. Let $f: R \rightarrow R$ be defined by $f(x) = 3x^2 - 5$ and $g: R \rightarrow R$ by $(x) = \frac{x}{x^2+1}$. Then gof is

(a) $\frac{3x^2-5}{9x^4-30x^2+26}$ (b) $\frac{3x^2-5}{9x^4-6x^2+26}$ (c) $\frac{3x^2}{x^4+2x^2-4}$ (d) $\frac{3x^2}{9x^4+30x^2-2}$

Q3. f: X →Y is onto, if and only if

(a) range of f = Y (b) range of f ≠ Y (c) range of f < Y (d) range of f ≥ Y

Q4. If $\sin^{-1}(x^2 - 7x + 12) = n\pi$, n ϵI, then x =

(a) –2 (b) 4 (c) –3 (d) 5

Q5. The value of expression $2\sec^{-1} 2 + \sin^{-1}(\frac{1}{2})$ is

(a) $\frac{\pi}{6}$ (b) $\frac{5\pi}{6}$ (c) $\frac{7\pi}{6}$ (d) 1

Q6. If $A = \begin{bmatrix} a & b \\ b & a \end{bmatrix}$ and $A^2 = \begin{bmatrix} \alpha & \beta \\ \beta & \beta \end{bmatrix}$ then:

(a) $\alpha = a^2 + b^2, \beta = ab$ (b) $\alpha = a^2 + b^2, \beta = 2ab$

(c) $\alpha = a^2 + b^2, \beta = a^2 - b^2$ (d) $\alpha = 2ab, \beta = a^2 + b^2$

Q7. What is true about matrix multiplication?

(a) It is commutative. (b) It is associative.

(c) Both of the above. (d) None of the above.

Q8. If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ is the sum of a symmetric matrix B and a skew symmetric matrix C, then C is

(a) $\begin{bmatrix} 1 & -5/2 \\ 5/2 & 0 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & -5/2 \\ 5/2 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 0 & -5/2 \\ 5/2 & 0 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & -3/2 \\ 5/2 & 1 \end{bmatrix}$

Q9. If $A = \begin{bmatrix} 1 & 0 & 3 \\ 2 & 1 & 1 \\ 0 & 0 & 2 \end{bmatrix}$, then the value of |adj(adjA)| is

(a) 14 (b) 16 (c) 15 (d) 12

Q10. **Assertion:** $\Delta = a_{11}A_{11} + a_{12}A_{12} + a_{13}A_{13}$ where, A_{ij} is cofactor of a_{ij}.

Reason: Δ= Sum of the products of elements of any row (or column) with their corresponding cofactors.

In the above question, a statement of assertion (A) is followed by a statement of Reason (R).

Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

Q11. Show that the relation R defined by $(a, b)R(c, d) \Rightarrow a + d = b + c$ on the set N X N is an equivalence relation.

Q12. A relation R is defined on a set of real number R as $R = \{(x, y): x.y \text{ is an irrational number}\}$. Check whether R is reflexive, symmetric and transitive or not.

Q13. Consider $f: R_+ \rightarrow [-5, \infty)$ given by $f(x) = 9x^2 + 6x - 5$. Show that f is invertible with $f^{-1}(y) = \left(\frac{\sqrt{y+6}-1}{3}\right)$.

Q14. Given that $f(x) = \sin x$ check if function f is one-one for (i) $(0, \pi)$ (ii) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$.

Q15. If $f: R \rightarrow R$ and $g: R \rightarrow R$ are defined respectively as $f(x) = x^2 + 3x + 1$ and $g(x) = 2x - 3$, find fog.

Q16. Evaluate: $sin - 1\,(sin\,\frac{3\pi}{4}) + cos\, -1(cos\pi) + tan - 1\,(1)$.

Q17. Show that: $\tan\left(\frac{1}{2}\sin^{-1}\frac{3}{4}\right) = \frac{4-\sqrt{7}}{3}$.

Q18. Write the principal value of $\tan^{-1}(\sqrt{3}) - \cot^{-1} -(\sqrt{3})$.

Q19. Write the value of $\tan^{-1}\left[2sin\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right]$.

Q20. Solve the following for x: $\cos^{-1}(sin(\cos^{-1}x)) = \frac{\pi}{3}$.

Q21. To promote the making of toilets for women, an organization tried to generate awareness through (i) House call (ii) letters and (iii) announcements.

The cost of each mode per attempt is given below:

(i) Rs.50 (ii) Rs.20 (iii) Rs.40

The number of attempts made in three villages X, Y and Z are given below:

	(i)	(ii)	(iii)
X	400	300	100
Y	300	250	75
Z	500	400	150
X	400	300	100

Find the total sum incurred by the organization for the three villages separately, using matrices.

Q22. If $A = \begin{bmatrix}\cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha\end{bmatrix}$, then for what value of α is A an identity matrix?

Q23. Find the matrix A such that: $\begin{bmatrix}2 & -1 \\ 1 & 0 \\ -3 & 4\end{bmatrix}A = \begin{bmatrix}-1 & -8 \\ 1 & -2 \\ 9 & 22\end{bmatrix}$.

Q24. If the matrix $\begin{bmatrix}0 & a & 3 \\ 2 & b & 1 \\ c & 1 & 0\end{bmatrix}$ is a skew symmetric matrix, find the values of a, b and c.

Q25. If $A = \begin{bmatrix}1 & 5 \\ 7 & 12\end{bmatrix}$ and $B = \begin{bmatrix}9 & 1 \\ 7 & 8\end{bmatrix}$, find a matrix C such that $3A + 5B + 2C$ is a null matrix.

Q26. If the points (a, 0), (0, b) and (1, 1) are collinear, prove that $a + b = ab$.

Q27. If the matrix $A = \begin{bmatrix}1 & -1 & 2 \\ 3 & 1 & -2 \\ 1 & 0 & 3\end{bmatrix}$, find $|adjA|$ without computing $adjA$.

Q28. If $A = \begin{bmatrix}1 & 5 \\ 7 & 12\end{bmatrix}$, find adj A and verify that $A(adj\ A) = |A|\ I_2 = (adj\ A)A$.

Q29. If $A = \begin{bmatrix}0 & 1 & 3 \\ 1 & 2 & x \\ 2 & 3 & 1\end{bmatrix}$ and $A^{-1} = \frac{1}{2}\begin{bmatrix}1 & -8 & 5 \\ -1 & 6 & -3 \\ 1 & 2y & 1\end{bmatrix}$, find the value(s) of x and y.

Q30. Using matrix method, solve the system of equations

$3x + 2y - 2z = 3, x + 2y + 3z = 6, 2x - y + z = 2.$

BIOLOGY (044)

DO THE FOLLOWING QUESTIONS OF CHAPTER IN BIO COPY

Q1. Ovulation takes place on of Menstrual cycle.

(a) 5th day (b) 14th day (c) 7th day (d) 28th day

Q2. In uterus, implantation occurs in the layer called …….

Q3. Note the relationship between first two terms and suggest a suitable term for the fourth place.
Progesterone: Corpus luteum HCG: .....

Q4. Structural and functional unit between mother and foetus is called …….

Q5. Match the columns A and B.

A	B
Corpus Luteum	Embryo
Leydig cells	Implantation
Blastocyst	Progesterone

Inner cell mass	Androgens
	Prolactin

Q6. Fusion of sperm with ovum is called .....

Q7. Fertilisation takes place in

(a) Ampullary region of fallopian tube (b) Endometrial lining of uterus (c) Cervical

Q8. Which of the following is mismatched?

i. Anther----Microsporangia ii. Pistil---Pollen grains

iii. Ovary---Fruit iv. Ovule---Seeds

Q9. Which of the following is a triploid structure?

i. Microspore ii. Megaspore iii. Polar nuclei iv. Endosperm

Q10. (a) Can a plant flowering in Mumbai be pollinated by pollen grains of the same species growing in New Delhi? Provide explanation to your answer.

Q11. Why is fertilization in an angiosperm referred to as double fertilization? Mention the policy of the cells involved.

Q12. Name and explain the role of inner and middle walls of human uterus.

Q13. Draw a diagrammatic sectional view of the female reproductive system of human and label the parts.

(a) Where the secondary oocyte develops?

(b) Which help in collection of ova after ovulation.

(c) Mention the hormones and their functions involved in maturation of ovum.

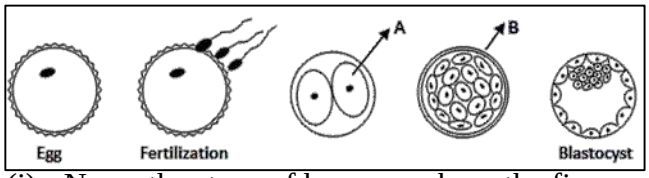
Q14. A woman has certain queries as listed below, before starting with contraceptive pills. Answer them.

(i) What do contraceptive pills contain and how do they act as contraceptives?

(ii) What schedule should be followed for taking these pills?

Q15. A couple where both husband and wife are producing functional gametes, but the wife is still unable to conceive, is seeking medical aid. Describe any one method that you can suggest to this couple to become happy parents.

Q16. Study the given figure below and answer the questions that follows.



(i) Name the stage of human embryo the figure represents.

(ii) Identify the figure and label the parts.

(iii) Mention the fate of the inner cells after implantation in the uterus.

(iv) Where are the stem cells located this embryo?

Q17. Describe endosperm the development in angiosperm.

Q18. Meiosis is an essential event in the sexual cycle of any organism. Give two reasons.

Q19. A flower of tomato plant following the process of sexual reproduction produces 240 viable seeds. Answer the following questions giving reasons:

(a) What is the minimum number of pollen grains that must have been involved in the pollination of its pistil?

(b) What would have been the minimum number of ovules present in the ovary?

(c) How many megaspore mother cells were involved?

Q20. Explain the events after pollination leading to the formation of a seed in angiosperms.

Q21. List any three outbreeding devices that flowering plants have developed and explain how they help to encourage cross-pollination.

Q22. Mature seeds of legumes are non-albuminous. Then, can it be assumed that double fertilisation does not occur in legumes? Explain your answer.

Q23. An anther with malfunctioning tapetum often fails to produce viable male gametophytes. Why?

Q24. What is the effect of high conc. of LH on a mature Graafian follicle?

Q25. How is Placenta formed in the human female? Name the hormones secreted b it and their function.

Q26. How does 'Cu T' act as an effective contraceptive?

Q27. Draw labelled diagrams for the following:

(a) T.S. of Testis. (b) Sectional view of human ovary.

(c) a fertilised embryo sac of a dicot flower (d) typical anatropous ovule

(i) MAKE THE BIOLOGY INVESTIGATORY PROJECT ON THE SELECTED TOPIC OF YOUR INTEREST AND SUBMIT IT AFTER THE SUMMER BREAK.

(ii) WRITTEN WORK OF PRACTICAL FILES TO BE COMPLETED.

INFORMATICS PRACTICES (065)

Q1. The Doc_name Column of a table Hospital is given below: **(Board-2011)**

Docname
Avinash
Hariharan
Vinayak
Deepak
Sanjeev

Based on the information, find the output of the following queries:

(i) Select doc_name from Hospital where doc_name like "%v";

(ii) Select doc_name from Hospital where doc_name like ":%e%";

Q2. Sarthak, a student of class XII, created a table "Class". Grade is one of the columns of this table. To find the details of students whose Grades have not been entered, he wrote the following MySql query, which did not give the desired result. **(Board-2011)**

SELECT * FROM Class WHERE Grade="Null";

Help Sarthak to run the query by removing the errors from the query and write the correctQuery.

Q3. In a database there are two tables "ITEM" and "CUSTOMER" as shown below:

Table: Employee

EmpId	Name	Sal	Deptno
T001	Vishakha	34000	10
T001	Mridul	32000	50
T001	Manish	45000	20

Table: Dept

Deptno	DName	LocationId
10	Lights	HH02
20	Dance	FF02
30	Production	AB01

Write the command in SQL queries for the following:

(i) To display the details of Items whose Price is in the range of 40 and 95 (Both values included)

(ii) To display the CustomerName, City from table Customer and ItemName and Price from table Item, with their corresponding matching ID.

To increase the price of all the products by 50.

Q4. Mr. Sanghi created two tables with CITY as Primary key in Table1 and Foreign Key in Table2. While inserting a row in Table2, Mr. Sanghi is not able to enter a value in the column CITY. What could be the possible reason for it? **(Board-2012)**

Q5. Write a SQL command to view the constraints of EMP table. **(Board-2012)**

Q6. What is the difference between CURDATE () and DATE () functions? **(Board-2013)**

Q7. Mrs. Kumar is using table STUDENTS with the following columns: **(Board-2014)**

RNO, ADMNO, NAME, AGGREGATE

She wants to display all information of students in descending order of name and within ascending order of aggregate. She wrote the following SQL query and she did not get the desired output:

SELECT * FROM STUDENTS ORDER BY NAME, AGGREGATE DESC;

Q8. A numeric column MONEY contains 34567.7896. Write a command to truncate MONEY. **(Board-2014)**

(i) Up to 2 decimal places. (i.e. expected result 34567.78)

(ii) Up to -3 places (i.e expected result 34000)

Q9. While using SQL pattern matching, what is the difference between '_' (underscore) and '%' wildcard symbols? **(Board-2015)**

Q10. (i) Name 2 Group (Aggregate) functions of SQL. **(Board-2016)**

(ii) Consider the table:

Table: Company

CompanyCode	Donations
C101	13000
C102	NULL
C104	7000
C105	4000

What output will be displayed by the following SQL statement:

SELECT AVG(Donations) FROM Company;

Q11. How is HAVING clause similar to WHERE clause? How is HAVING clause different from WHEREclause? Explain with the help of examples of each. **(Board-2017)**

Q12. Consider the table EXAM given below. Write commands in MySql for(i) to (iv) and output for (v) to (vii)

No	Name	Stipend	Subject	Average	Division
1	Karan	400	English	68	FIRST
2	Aman	680	Mathematics	72	FIRST
3	Javed	500	Accounts	67	FIRST
4	Bishakh	200	Informatics	55	SECOND
5	Sugandha	400	History	35	THIRD
6	Suparna	550	Geography	45	THIRD

(i) To list the names of those students, who have obtained Division as FIRST in the ascending order of NAME?

(ii) To display a report listing NAME, SUBJECT and Annual stipend received assuming that the stipend column has monthly stipend.

(iii) To count the number of students, who have either accounts or informatics as subject?

(iv) To insert a new row in the table EXAM: 6,"Mohan",500,"English",73,"Second"

(v) SELECT AVG(Stipend) FROM EXAM WHERE DIVISION="THIRD"

(vi) SELECT COUNT(DISTINCT Subject) FROM EXAM;

SELECT MIN(Average) FROM EXAM WHERE Subject="English";

Q13. A table STUDENT has 4 rows and 2 columns and another table TEACHER has 3 row and 4 columns. How many rows and columns will be there if we obtain the Cartesian product of these two tables? **Board-2012**

Q14. In the Database –SAMS and VENDOR are two tables with the following information. Write MySQL queries for (i) to (iii), based on the tables SAMS and VENDORS. **Board-2014**

Table: SAMS

ICode	IName	Price	Colour	VCode
S001	Refrigerator	20000	Blue	P01
S002	Mobile Phone	45000	Black	P02
S003	LCD	60000	Silver	P03
S004	Washing Machine	12500	Smoke	P01
S005	Air Conditioner	16000	White	P03

Table: VENDOR

VCode	VName
P01	Satish

P02	Manoj
P03	Subodh
P04	Jacob

(i) To display ICode, IName and VName of all the Vendors, who manufacture "Refrigerator"
(ii) To display IName, ICode, VName and Price of all the products whose price is more than 20000.
(iii) To display vendor names and names of all items manufactured by vendor whose code is "P03"

Q15. In a database company, there are two tables given below **Board-2015**

Table: SALES

SALESMANID	NAME	SALES	LOCATIONID
S1	ANITA SINGH ARORA	250000	102
S2	Y.P.SINGH	1300000	101
S3	TINA JAISWAL	1400000	103
S4	GURDEEP SINGH	1250000	102
S5	SIMI FAIZAL	1450000	103

Table: Vacation

LOCATIONID	LOCATIONNAME
101	Delhi
102	Mumbai
103	Kolkata
104	Chennai

Write SQL queries for the following:

(i) To display SalesmanID, names of salesmen, LocationID with corresponding locationnames.
(ii) To display names of salesmen, sales and corresponding location names who have achieved Sales more than 1300000.
(iii) To display names of those salesmen who have 'SINGH' in their names.
(iv) Identify Primary key in the table SALES. Give reason for your choice.
(v) Write SQL command to change the LocationID to 104 of the Salesman with ID as S3 in the table 'SALES'.

PHYSICAL EDUCATION (048)

VERY SHORT TYPE OF QUESTION:-

Q1. How many rounds will be played according to knock out basis if the number of teams are 33?

Q2. How many teams are kept in first quarters if the total number of teams are 29?

Q3. How many teams are kept in first and third quarters if the total number of teams are 30?

Q4. How many types of Amenorrhea are there?

Q5. In which triad female athlete tries to lose their body weight?

Q6. How many types of Eating disorder are there?

DESCRIPTIVE TYPE OF QUESTION:-

Q1. How many functions are there of sporting events, explain it briefly.

Q2. Describe a role of any five committees to organize a sports events.

Q3. Draw a fixture of 23 teams on the basis of knock out method.

Q4. Draw a fixture of 12 teams on the basis of knock out method.

Q5. Draw a fixture of 26 teams on the basis of knock out method.

Q6. Draw a fixture of 20 teams on the basis of knock out method and 4 teams are to be kept as a special seeded teams.

Q7. Draw a fixture of 24 teams on the basis of knock out method and 4 teams are to be kept as a special seeded teams.

Q8. Draw a fixture of 28 teams on the basis of knock out method and 2 teams are to be kept as a seeded teams.

Q9. Draw a fixture of 14 teams on the basis of knock out method and 2 teams are to be kept as a seeded teams.

Q10. Draw a fixture of 8 teams on the basis of cyclic method.

Q11. Draw a fixture of 11 teams on the basis of staircase method.

Q12. Write causes, precautions and any four remedies of Kyphosis.

Q13. Write causes, precautions and any four remedies of Scoliosis.

Q14. Write causes, precautions and any four remedies of Knock knee.

Q15. Write causes, precautions and any four remedies of Bow leg.

Q16. Write causes, precautions and any four remedies of Round shoulder.

Q17. Define Kyphosis and Lordosis.

Q18. Define Scoliosis and Flat foot.

Q19. Define Bow leg and Knock knee.

Q20. Define Menarche and Menstrual dysfunction.

Q21. Define Osteoporosis and Amenorrhea.

Q22. Describe the factors of Amenorrhea.

Q23. Explain the types of eating disorder.

Q24. Explain the factors of Osteoporosis.

ECONOMICS (030)

Q1. Assume there are only three industries in the imaginary economy, namely A, B and C. The following data about their transaction are given below:

(i) A buys ₹100 worth goods from B, sells ₹ 200 worth of goods to C and ₹ 100 worth of goods to households.

(ii) C sells ₹ 400 worth of goods to household.

Calculate the value of output and income generation by each of the above industries.

Q2. An economy has only two firms A and B. On the basis of following information about the firms, find out (a) Value added by firm A and B (b) GDP_{MP}.

	Particulars	**₹ in crores**
(i)	Exports by firm A	20
(ii)	Imports by firm A	50
(iii)	Sales to households by firm A	90
(iv)	Sales to firm B by firm A	40
(v)	Sales to firm Aby firm B	30
(vi)	Sales to household by firm B	60

Q3. Calculate GNP_{FC} by (a) Income Method (b) Expenditure Method:

	Particulars	**₹ in crores**
(i)	Sales by firm A	100
(ii)	Purchases from firm B by firm A	40
(iii)	Purchases from firm A by firm B	60
(iv)	Sales by firm B	200
(v)	Closing stock of firm A	20
(vi)	Closing stock of firm B	35
(vii)	Opening stock of firm A	25
(viii)	Opening stock of firm B	45
(ix)	Indirect taxes paid by both the firms	30

Q4. Calculate NVA_{FC}.

Particulars	**₹ in crores**

Price per unit of output	25
Output sold	1000
Excise duty	5000
Depreciation	1000
Change in stock	(-)500
Intermediate cost	7000

Q5. From the following data about a firm X for the year 2000-01, calculate the net value added at market price during that year:

	Particulars	₹ in crores
(i)	Sales	90
(ii)	Closing stock	25
(iii)	Opening stock	15
(iv)	Indirect taxes	10
(v)	Depreciation	20
(vi)	Intermediate consumption	40
(vii)	Purchases of raw material	15
(viii)	Rent	5

Q6. Calculate value added by firm A and firm B.

	Particulars	₹ in crores
(i)	Domestic sales by firm A	4,000
(ii)	Exports by firm A	1,000
(iii)	Purchases by firm A	1,200
(iv)	Sales by firm B	2,940
(v)	Purchases by firm B	1,800

Q7. Calculate GVA_{FC}

	Particulars	₹ in crores
(i)	Sales	180
(ii)	Rent	5
(iii)	Subsidies	10
(iv)	Change in stock	15
(v)	Purchases of raw material	100
(vi)	Profits	25

Q8. Calculate 'intermediate consumption'

	Particulars	₹ in crores
(i)	Value of output	200
(ii)	Net value added at factor cost	80
(iii)	Sales tax	15
(iv)	Subsidies	5
(v)	Depreciation	20

Q9. Calculate 'intermediate consumption'

	Particulars	₹ in crores
(i)	Net value added at factor cost	300
(ii)	Intermediate consumption	200
(iii)	Indirect tax	20
(iv)	Depreciation	30
(v)	Change in stock	(-)50

Q10. Calculate GDP_{MP}

	Particulars	₹ in crores
(i)	Private final consumption expenditure	15,000
(ii)	Government final consumption expenditure	11,500
(iii)	Gross fixed capital formation	1,000
(iv)	Increase in stock	200

(v)	Exports	500
(vi)	Imports	700
(vii)	Capital consumption allowances	650
(viii)	Net indirect taxes	500

Q11. Calculate National income:

	Particulars	(₹)
(i)	Opening stock	50
(ii)	Closing stock	60
(iii)	Consumption of fixed capital	10
(iv)	Private final consumption expenditure	500
(v)	Net exports	(-)25
(vi)	Net factor income from abroad	10
(vii)	Compensation of employees	100
(viii)	Direct purchases of non-durable goods from abroad by general government	10
(ix)	Net purchases of goods and services by general government in domestic market	100
(x)	Net capital formation	160
(xi)	Net indirect taxes	150

Q12. Calculate National income:

	Particulars	₹ in crores
(i)	Private final consumption expenditure in domestic market	1750
(ii)	Government final consumption expenditure	100
(iii)	Consumption of fixed capital	25
(iv)	Net exports	(-) 25
(v)	Net factor income from abroad	(-) 20
(vi)	Gross fixed capital formation	300
(vii)	Change in stock	50
(viii)	Direct purchases from abroad by resident household	50
(ix)	Direct purchases by non-resident in domestic market	100
(x)	Net indirect taxes	100

Q13. Calculate NNP_{MP}

	Particulars	₹ in crores
(i)	Private final consumption expenditure	200
(ii)	Net indirect taxes	20
(iii)	change in stock	(-) 5
(iv)	Net current transfer from abroad	(-) 10
(v)	Government final consumption expenditure	50
(vi)	Consumption of fixed capital	15
(vii)	Net fixed capital formation	30
(viii)	Net factor income from abroad	5
(ix)	Net imports	10

Q14. Calculate NNP_{FC}

	Particulars	₹ in crores
(i)	Government final consumption expenditure	60
(ii)	Net exports	10
(iii)	Change in stock	5
(iv)	Consumption of fixed capital	20
(v)	Private final consumption expenditure	250
(vi)	Net factor income from abroad	(-) 5
(vii)	Net domestic capital formation	40
(viii)	Net current transfers from abroad	10
(ix)	Net indirect taxes	15

Q15. Calculate GNP_{MP}

	Particulars	₹ in crores
(i)	Imports	20

(ii)	Government final consumption expenditure	60
(iii)	Net factor income from abroad	(-) 5
(iv)	Net current transfer from abroad	5
(v)	Private final consumption expenditure	200
(vi)	Subsidies	10
(vii)	Indirect taxes	40
(viii)	Net domestic capital formation	70
(ix)	Exports	20
(x)	Consumption of fixed capital	15

Q16. Calculate GNP_{FC}

	Particulars	**₹ in crores**
(i)	Net change in stock	50
(ii)	Government final consumption expenditure	100
(iii)	Net current transfer to abroad	30
(iv)	Gross domestic fixed capital formation	200
(v)	Private final consumption expenditure	500
(vi)	Net imports	40
(vii)	Depreciation	70
(viii)	Net factor income to abroad	(-) 10
(ix)	Net indirect taxes	120
(x)	Net capital transfer to abroad	25

Q17. Calculate NNP_{FC}

	Particulars	**₹ in crores**
(i)	Private final consumption expenditure	900
(ii)	Profit	100
(iii)	Government final consumption expenditure	400
(iv)	Net indirect taxes	100
(v)	Gross domestic capital formation	250
(vi)	Change in stock	50
(vii)	Net factor income from abroad	(-) 40
(viii)	Consumption of fixed capital	20
(ix)	Net imports	30

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Understanding Chat-GPT, And Why It's Even Bigger Than You Think

BY JOSHBERSIN · PUBLISHED JANUARY 22, 2023 · UPDATED FEBRUARY 28, 2023

Everyone has an opinion about Chat-GPT and AI. Engineers and entrepreneurs see it as a new frontier: a bold new world to invent products, services, and solutions. Social scientists and journalists are worried, with one prominent NYT author Ezra Klein calling it an "information warfare machine." What has god wrought?
Let me just say up front, I see enormous possibilities here. And as with all new technologies, we cannot fully predict the impact quite yet. There will be problems and failures, but the ultimate story is "hooray."

What Is Chat-GPT?

To put it quite simply, this technology (and there are many others like it) is what is often called a "language machine" that uses statistics, reinforcement learning, and supervised learning to index words, phrases, and sentences. While it has no real "intelligence" (it doesn't know what a word "means" but it knows how it is used), it can very effectively answer questions, write articles, summarize information, and more.
Engines like Chat-GPT are "trained" (programmed and reinforced) to mimic writing styles, avoid certain types of conversations, and learn from your questions. In other words, the more advanced models can refine answers as you ask more questions, and then store what it learned for others. (Read Terry Sejnowski's just-released in-depth explanation to understand why they seem human.)
While this is not a new idea (we've had chatbots for a decade, including Siri, Alexa, Olivia, and more), the level of performance in GPT-3.5 (the latest version) is astounding. I've asked it questions like "what are the best practices for recruiting" or "how do you build a corporate training program" and it answered pretty well. Yes, the answers were quite elementary and somewhat incorrect, but with training they will clearly get better.

And it has lots of other capabilities. It can answer historic questions (who was president of the US in 1956), it can write code (Satya Nadella believes 80% of code will be automatically generated), and it can write news articles, information summaries, and more.

One of the vendors I talked with last week is using a derivative of GPT-3 to create automatic quizzes from courses and serve as a "virtual Teaching Assistant." And that gets me to the potential use cases here.

(PS in some ways the chatbot itself may be a commodity: there are at least 20 start-ups with highly funded AI teams building derivative or competing products.)

Read the rest of the article at: https://joshbersin.com/2023/01/understanding-chat-gpt-and-why-its-even-bigger-than-you-think/