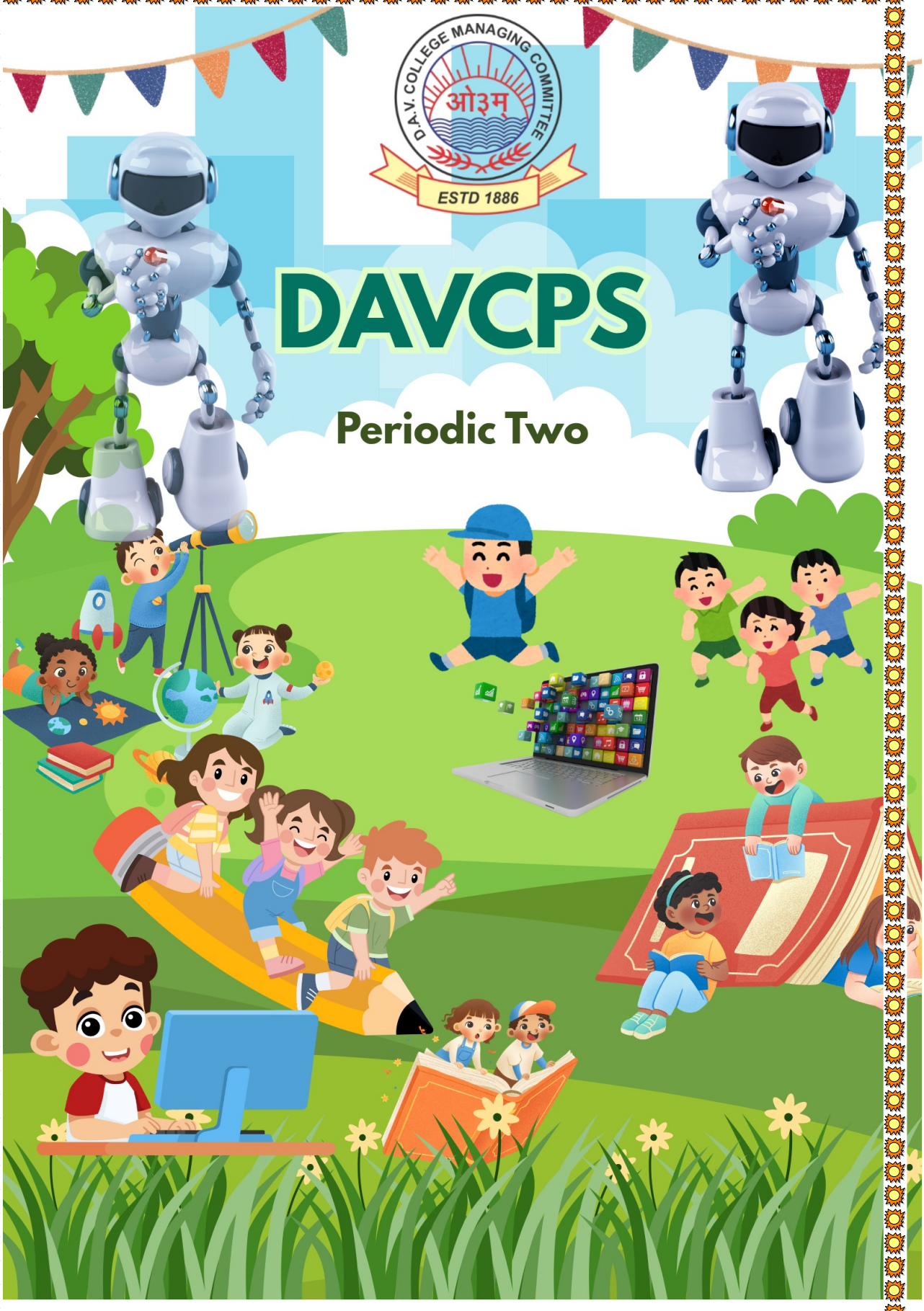
D.A.V. COLLEGE MANAGING COMMITTEE
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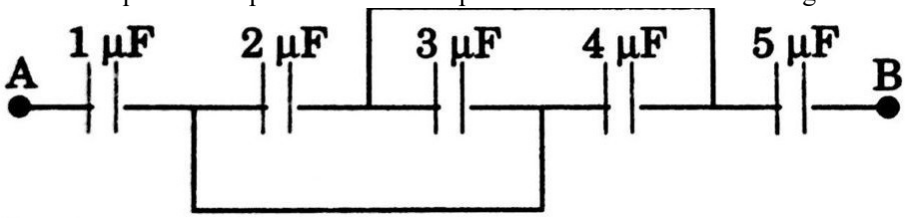
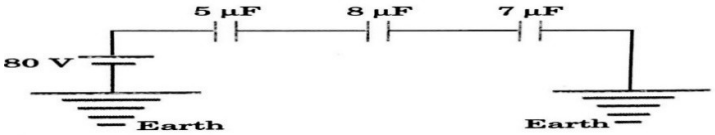
Physics Homework

1. 27 Spherical drops, each carrying a charge of 10^{-3}uC that are at a potential of 1000 V are combined to form a bigger drop. What would be the potential of this bigger drop?

2. Find the equivalent capacitance between points A and B for the following network of capacitors.



3. Find the potential difference developed across each of the capacitors shown in the following



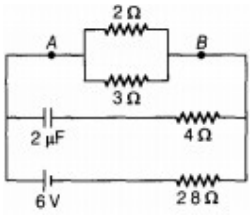
arrangement.

4. Electric Field of 10^5 N/C exists in-between the plates of an air capacitor, which are separated by a distance of 4 cm.
(i) What will be the potential difference between the plates of the capacitor?
(ii) A metal plate of thickness 1 cm is introduced between the plates. Calculate the potential difference between the plates after the plate is introduced.
(iii) What will be the potential difference between the plates if there is a dielectric slab of dielectric constant 4 instead of metal plate?

5. A conducting sphere of radius 5 cm is charged to 15 μC. Another uncharged sphere of radius 10 cm is allowed to touch it for enough time. After the two are separated, the surface density of charge on the two spheres will be in the ratio?

6. What are the dimensions of capacitance?

7. Calculate the steady current through the 2Ω2Ω resistor in the circuit shown in the figure.



8. Two conducting wires X and Y of same diameter but different materials are joined in series across a battery. If the number density of electrons in X is twice than that in Y, then find the ratio of drift velocity of electrons in the two wires.

9. If 10^9 electrons move out of a body to another body every second, how much time is required to get a total charge of 1C on another body?

10. What is meant by 'charging by induction'? Why we can't charge an insulator by this method?

11. Explain the meaning of the statement 'electric charge of a body is quantized'

12. Define Electric flux and write its S.I units

13. An infinitely long positively charged straight wire has a linear charge density λ Cm^{-1}. An electron revolves around the wire as its centre with a constant velocity in a circular path in a plane perpendicular to the wire. Find the expression for its kinetic energy and also plot the graph of K.E as a function of λ.

14. 8 charged water droplets each with a radius of 1mm and charge of 10^{-9} C Coalesce to form a single drop. calculate the potential of bigger drop.

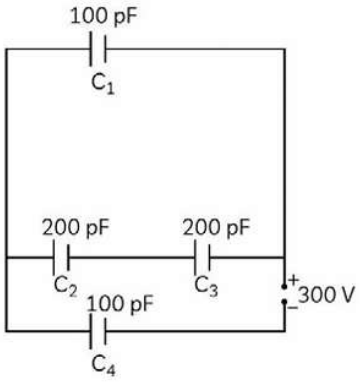
15. 3 concentric metallic shells A, B and C of radii a, b and c (a<b<c) have surface charge densities $+\sigma$, $-\sigma$ and $+\sigma$ respectively. Find the potential of the 3 shells A, B and C.

16. 3 point charges Q, -4Q and 2Q are placed at the vertices of an equilateral triangle ABC of side *l*. Find the work done to separate the charges at infinite distance.

17.

(A) Derive an expression for the capacitance of a parallel plate capacitor with air present between the two plates.

(B) Obtain the equivalent capacitance of the network shown in figure. For a 300 V supply, determine the charge on each capacitor.



[CBSE SQP 2023]

18. What are ohmic and non-ohmic devices? Explain

19. The resistance of a conductor at 20 ^{0}C is 6.3 Ω and at 100 ^{0}C it is 7.5 Ω. Calculate the resistance of the conductor at 0 ^{0}C and its temp coeff. Of resistance

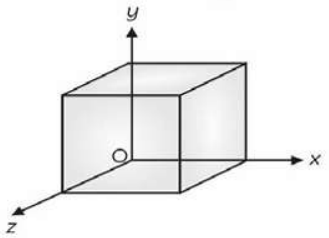
20. State the condition under which ohm's law is not applicable

21. A cube of side 20 cm is kept in a region as shown in the figure. An electric field E exists in the region such that the potential at a point is given by $V = 10x + 5$, where V is in volt and x is in m.

Find the:

(A) electric field E and,

(B) total electric flux through the cube



[CBSE 2020]

22.

A steady current of 8 mA flows through a wire. The number of electrons passing thou a cross-section of the wire in 10 s is:

(a) 4.0×10^{16}
(b) 5.0×10^{17}
(c) 1.6×10^{16}
(d) 1.0×10^{17}

[CBSE 2023]

23.

A potential difference of 200 V is maintained across a conductor of resistance 100Ω. T number of electrons passing through it in 1 s is:

(a) 1.25×10^{19}
(b) 2.5×10^{18}
(c) 1.25×10^{10}
(d) 2.5×10^{16}

[CBSE 2023]

24.

The temperature (T) dependence of resistivity of material A and material B is represented by fig (i) and fig (ii) respectively.

Identify material A and material B.

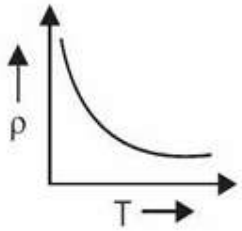


fig. (i)

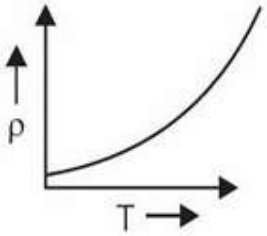


fig. (ii)

(a) material A is copper and material B is germanium.

(b) material A is germanium and material B is copper.

(c) material A is nichrome and material B is germanium.

(d) material A is copper and material B is nichrome.

25.

An electric current is passed through a circuit containing two wires of same material, connected in parallel. If the lengths and radii of the wires are in the ratio of 3: 2 and 2: 3, then the ratio of the current passing through the wire will be:

(a) 2: 3
(b) 3: 2
(c) 8: 27
(d) 27: 8

26. A battery is connected to the conductor of non-uniform cross-section area. The quantities or quantity which remains constant is:

(a) electric field only

(b) drift speed and electric field

(c) electric field and current

(d) current only

27. Which of the following has negative temperature coefficient of resistivity?

(a) Metal

(b) Metal and semiconductor

(c) Semiconductor

(d) Metal and alloy

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

29. A potential difference V is applied across the ends of copper wire of length l and diameter D. What is the effect on drift velocity of electrons if:

(A) V is halved?

(B) l is doubled?

(C) D is halved?

30. Define the term drift velocity of charge carriers in a conductor and write its relationship with the current flowing through it.

31.

Estimate the average drift speed of conduction electrons in a copper wire of cross-sectional area 1.0×10^{-7} m^2 carrying a current of 1.5 A. Assume the density of conduction electrons to be 9×10^{28} m^{-3}.

[CBSE 2014]

Chemistry Homework

1. Made a concept map of chapter solution and electrochemistry.

2. The chemistry of corrosion of iron is essentially an electrochemical phenomena .Explain the reactions occurring during the corrosion of iron in the atmosphere.

3. Mention the reaction occurring at anode and cathode during working of a Mercury cell why does the voltage of a Mercury cell remains constant during its operation?

4. Answer the following

a) which cell is used in hearing AIDS?

b) which cell was used in Apollo space program?

c) which cell is used in automobiles and inverters?

d) which cell does not have long life?

5. Define limiting molar conductivity why conductivity of an electrolyte solution decreases with decrease in concentration.

6. What is the necessary to use a Salt bridge in a galvanic cell?

7. Elevation of boiling point of 1 molar KCL solution is nearly double then that of 1 molars sugar solution.

8. Why does a solution containing non volatile solute have higher boiling point then the pure solvent why is elevation of boiling point a colligative property?

9. What is advantage of using osmotic pressure as compared to other colligative properties for the determination of molar masses of solute in solutions.

10. Explain why a solution of chloroform and acetone shows negative deviation from Raoult's law.

11. Why are alkyl halides insoluble in water

12. Why does paradiglorobenzene have a higher melting point then its author and meta isomers.

13. Write down the basic difference between SN1 and SN2 reactions.

14. Write down the sandmeyer,sward,finkelstein reactions

Maths Homework

Chapter - 1 (Relations & Functions)

Q. 1 : If f : $R^+ \rightarrow$ R is defined as f (x) = $\log_a$x (a > 0 and a ≠ 1), Prove that f is a bijection.

Q. 2 : Let A = {1, 2, 3} and B = {4, 5, 6}. A relation R from A to B defined as R = {(x, y) : x + y = 6, x ∈ A, y ∈ B}.

(i) Write all elements of R. (ii) Is R a function ? Justify.

(iii) Determine domain and range of R.

Q. 3 : A student wants to pair up natural numbers in such a way that they satisfy the equation 2x + y = 41, x, y ∈ N.

Find the domain and range of the relation. Check if the relation thus formed is reflexive, symmetric and

transitive. Hence, state whether it is an equivalence relation or not.

Q. 4 : Show that the function f: N → N, where N is a set of natural numbers, given by

f(n) = $\begin{cases} n-1, if\ n\ is\ even \\ n+1, if\ n\ is\ odd \end{cases}$ is a bijection.

Q. 5 : A relation R on set A = {1, 2, 3, 4, 5} is defined asR = {(x, y) : $|x^2 - y^2| < 8$). Check whether the relation R is

reflexive,symmetric and transitive.

Q. 6 : A function fis defined from R → R as f(x) = ax + b, such that f(1) = 1and f(2) = 3. Find function f(x). Hence,

check whether function f(x) isone-one and onto or not.

Q.7 : A class-room teacher is keen to assess the learning of her students the concept of "relations" taught to them.

She writes the following fiverelations each defined on the set A = {1, 2, 3} :

R1 = {(2, 3), (3, 2)}

R2 = {(1, 2), (1, 3), (3, 2)}

R3 = {(1, 2), (2, 1), (1, 1)}

R4 = {(1, 1), (1, 2), (3, 3), (2, 2)}

R5 = {(1, 1), (1, 2), (3, 3), (2, 2), (2, 1), (2, 3), (3, 2)}

The students are asked to answer the following questions about the above relations :

(i) Identify the relation which is reflexive, transitive but not symmetric.

(ii) Identify the relation which is reflexive and symmetric but nottransitive.

(iii) Identify the relations which are symmetric but neither reflexivenor transitive.

(iv) What pairs should be added to the relation R2 to make it anequivalence relation ?

Q. 8 : A school is organizing a debate competition with participants as speakersS = (S_1, S_2, S_3, S_4) and these are

judged by judges J = (J_1, J_2, J_3}. Eachspeaker can be assigned one judge. Let R be a relation from set S to J

defined as R = (x, y) : speaker x is judged by judge y, x ∈S, y ∈J}.

Based on the above, answer the following :

(i) How many relations can be there from S to J?

(ii) A student identifies a function from S to J as f = {(S_1, J_1), (S_2, J_2),(S_3, J_2), (S_4, J_3)} Check if it is bijective.

(iii) How many one-one functions can be there from set S to set J?

(iv) Another student considers a relation R_1 = {(S_1, S_2), (S_2, S_4)} inset S. Write minimum ordered pairs to be

included in R_1 so that R_1 is reflexive but not symmetric.

Chapter – 2 (Inverse Trigonometric Functions)

Q. 9 : Evaluate :$\tan^{-1}[2\sin(2\cos^{-1}\frac{\sqrt{3}}{2})]$

Q. 10 : Evaluate :$\sin^{-1}(\sin\frac{3\pi}{5})$

Q. 11 : Simplify $\sin^{-1}(\frac{x}{\sqrt{1+x^2}})$

Q. 12 : Find domain of $\sin^{-1}\sqrt{x-1}$.

Q. 13 : Find the value of $\cos^{-1}(\frac{1}{2})-\tan^{-1}(-\frac{1}{\sqrt{3}})+\text{cosec}^{-1}(-2)$.

Q. 14 : Find the domain of the function f (x) = $\cos^{-1}(x^2-4)$.

Q. 15 : Find the domain of f (x) = $\sin^{-1}(-x^2)$.

Q. 16 : If a function f: X → Y defined as f(x) = y is one-one and onto, then we can define a unique function g : Y → X

such that g(y) = x, where x ∈ X andy = f(x), y ∈ Y. Function g is called the inverse of function f.

The domain of sine function is R and function sine : R → R is neither one-one nor onto.

Let sine function be defined from set A to l- 1, 1l such that inverse of sine function exists, i.e., sin-1 x is defined

from (- 1, 1] to A.

On the basis of the above information, answer the following questions :

(i) If A is the interval other than principal value branch, give an example of one such interval.

(ii) If $\sin^{-1}$ (x) is defined from |- 1, 1] to its principal value branch, find the value of $\sin^{-1}$ $(-\frac{1}{2})$ - $\sin^{-1}$ (1).

(iii) Draw the graph of $\sin^{-1}$x from I- 1, 1] to its principal value branch.

(iv) Find the domain and range of f(x) = 2 $\sin^{-1}$ (1 - x).

Chapter – 3, 4 (Matrices & Determinants)

Q. 17 : A school wants to allocate students into three clubs: Sports, Music and Drama, under following conditions :

- The number of students in Sports club should be equal to the sum of the number of students in Music and Drama club.
- The number of students in Music club should be 20 more than half the number of students in Sports club.
- The total number of students to be allocated in all three clubs are 180.

Find the number of students allocated to different clubs, using matrix method.

Q. 18 : A shopkeeper sells 50 Chemistry, 60 Physics and 35 Maths books on day I and sells 40 Chemistry, 45 Physics

and 50 Maths books on day II. If the selling price for each such subject book is Rs. 150 (Chemistry), Rs. 175

(Physics) and Rs. 180 (Maths), then find his total sale in two days, using matrix method. If cost price of all the

books together isRs. 35,000, what profit did he earn after the sale of two days?

Q. 19 : Let 2x + 5y - 1 = 0 and 3x + 2y - 7 = 0 represent the equations of two lines on which the ants are moving on the

ground. Using matrix method, find a point common to the paths of the ants.

Q. 20 : A furniture workshop produces three types of furniture - chairs, tables and beds each day. On a particular day

the total number of furniture pieces produced is 45. It was also found that production of beds exceeds that of

chairs by 8, while the total production of beds and chairs together is twice the production of tables.

Determine the units produced of each type of furniture, using matrix method.

Q. 21 : Let A and B be two square matrices of order 3 such that det (A) = 3 and det (B) = - 4.

Find the value of det (-6AB).

Q. 22 : If A is a 3 x 3 invertible matrix slow that for any scalar k ≠ 0,$(kA)^{-1} = \frac{1}{k}A^{-1}. Hence\ calculate (3A)^{-1}$, where

A = $\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$.

Q. 23 : IF A = $\begin{bmatrix} -1 & a & 2 \\ 1 & 2 & x \\ 3 & 1 & 1 \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 1 & -1 & 1 \\ -8 & 7 & -5 \\ b & y & 3 \end{bmatrix}$,

Find the value of (a + x) – (b + y).

Q. 24 : Let A = $\begin{bmatrix} 1 \\ 4 \\ -2 \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 3 & 4 & 2 \\ 12 & 16 & 8 \\ -6 & -8 & -4 \end{bmatrix}$ be two matrices. Then, find the matrix B if AB = C.

Q. 25 : Given A = $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$, Find AB. Hence, solve the system of linear equations :

x – y + z = 4 x – 2y – 2z = 9 2x + y + 3z = 1

Biology Homework

THE MALE REPRODUCTIVE SYSTEM : -

Q.1. With the help of neat and well labelled diagram ,describe briefly the human male reproductive system .

Q.2. Draw a diagram of T.S of a part of seminiferous tubules of testis of an adult human male and label any six parts in it ./ Describe briefly the internal structure of human testis .

Q.3 what is rete – testis ?

Q.4 What is semen ?

Q.5 What is puberty ? what changes occurs in the male human during puberty ?

Q.6 Name the hormones responsible for the descent of testes into the scrotum . Why does the future of this process result in sterility ?

Q.7 Why do testes ascend into the abdomen in response to fear or cold ? / What is cremasteric reflex ?

Q.8 Explain the significance of the condition in human in which the testes remain suspended in scrotum outside the abdominal cavity .

Q.9 One sperm is sufficient to fertilize the ovum .Then , why does human ejaculate carry sufficient number of sperms ?

Q.10 What would happen if the testes are retained inside the abdomen and not in scrotum ?

Q. 11 What are the major components of seminal plasma ?

Q.12 Distinguish between :-

(i) Seminiferous tubules and leydig cells

(ii) Vas deferens and vas efferentia .

Q.13 Why are human male reproductivity active throughout their life span and not the human female ?

Q.14 What are the major functions of male accessory ducts and glands ?

THE FEMALE REPRODUCTIVE SYSTEM :-

Q.15 Describe briefly human female reproductive system with the help of neat and well labelled diagram?

Q.16 Describe briefly the internal structure of human ovary?

Q.17 What are the differences between primary and secondary sex organs?

Q.18 What is mesovarium ?

Q.19 What is cumulus oophorus ?

Q.20 What is fullicularatresia ?

Q.21 What general changes in the body of female occur during puberty?

Q.22 Describe briefly the structure of a mammary gland?

GAMETOGENESIS :-

Q.1 What is spermatogenesis ? Where does it occur ? Describe the stages of this process ?

Q.2 What is spermiogenesis ? Write down various changes that occur during this process ?

Q.3 What are the differences between spermiogenesis andspermiation ?

Q.4. How do leydig cells help in spermatogenesis ?

Q.5 What is the significance of spermatogenesis ?

Q.6 Spermatids possess haploid chromosome number .Why ?

Q.7 Describe briefly the structure of human sperm .

Q.8 What is the utility of mitrochondria in the middle piece of sperm ?

Q.9 How would it affect the fertilization when the acrosome of a mammalian sperm does not function normally ?

Q.10 Describe briefly about the various endocrine glands that control the process of spermatogenesis .

Q.11 Where does oogenesis take place ? Describe the stages of this process . OR

Q.12 Describe oogenesis in human female. What promotes completion of second meiotic division in oogenesis?

Q.13 What is the significance of oogenesis ?

Q.14 What is ovulation? Name the hormones which facilitate this process .

Q.15 Describe briefly the structure of human ovum .

Q.16 What are the main differences and similarities between spermatogenesis and oogenesis ?

Q.17 What forms corpus luteum ? What is its function ?

Q.18 Tabulate the main differences between human sperm and ovum .

Q.19. Differentiate between :-

(i) Spermatocytes and oocytes (ii) Graafian follicles and corpus luteum . (iii)Oogenesis and ovulation .

CH 1 REPRODUCTION IN FLOWERING PLANTS

POLLEN – PISTIL INTERACTION :-

Q.l. Draw a longitudinal section of a pistal showing pollen germination . Explain the events on the embryo – sac during the process of fertilization . Which resulting stages give rise to the embryo and the endosperms respectively ?

Q.2. What is the process of double fertilization ? Give its significance .

Q.3. Define tripplefusion . What is the product of this process ? What does the product develop into ?

Q.4. Define the following : -

(i) Porogamy (ii) Chalazogamy (iii) Mesogamy .

Q.5. What do the following parts form in a fruit ? Ovary wall, Outer integument , inner integument ,zygote , primary endosperm, nucleus ,ovule .

Q.6. How many chromosomes would you expect in the following , the diploid number of chromosomes in an angiospermic plants is 18 ? (i) endosperm (ii) embryo (iii) antipodal cell (iii) integument and nucleus .

ENDOSPERM &EMBRYO : -

Q.7. What is endosperm ? Give an illustrated account of the development of endosperm . mention the types with examples.

Q.8. What do you understand by the development of an embryo ? Support the answer with suitable diagrams .

Q.9 Why do you think the zygote is dominant for some time in a fertilized ovule ?

SEED :-

Q.10 What is a seed ? differentiate between endospermic and non endospermicseeds .

Q.11. Describe briefly the structure of dicotyledonous exalbuminous(bean) seed.

Q. 12. Describe briefly the structure of monocotyledonous albuminous seed .

Q. 13. In what sense seeds are a physiological enigma ?

Q.14 What is the significance of seeds ?

Q.15Tabulate the essential differences in the structure of a dicotyledonous and a monocotyledonous seed .

Q.16. What are the parthenocarpicfruits ? Name few chemicals and hormones which induce the parthenocarpy.

Q.17 What is the difference between albuminous and non albuminousseeds ?

Q.18. Differentiate between :- (a) Hypocoty and epicotyls (b) coleoptiles and coleorrhiza (c) Integument and testa (d) Perisperm and pericarp .

Q.19. What is a fruit ? Describe various zones of fruit by taking any example of succulent fruit .

Q.20. Draw a labelled diagram of V.S. of apple. Justify 'An apple is a false fruit' .

Q.21Explain the biological and economic importance of fruits.

INCOMPATIBILITY : -

Q.22. What do you understand by term 'incompatibility'?

Q.23 "Incompatibility is a natural barrier in the fusion of gametes". Justify the statement.

SPECIAL MODES OF REPRODUCTION :-

Q. 24. Describe in brief the various special modes of reproduction. Mention their economic significance.

Q.25. what are the problem that the plant breeder has to face in using hybrid varieties of seeds?

Q. 26. what is the importance of apomixes in hybrid seed industry?

English Homework

1. Maintain a scrapbook with weekly entries (6 total), each covering a current event or issue linked to the five themes.

- Environment
- Education
- Role of Women
- Gender Equality
- Health and Hygiene

Note: Include your opinion, vocabulary used, and a creative visual (art, quote, photo etc).

2.“***Screen Time vs. Green Time – Reclaiming Life Beyond Gadgets”***

Write an article expressing your views on how overuse of screens is affecting teenagers and suggest how spending time with nature can help. (150–200 words)

3.You are the Cultural Secretary of your school. Your school is organizing a “Monsoon Art & Expression Fest.” Draft a notice inviting students to participate in the event. Include necessary details.

4. Write a personal blog-style article on “**My Daily Health Habits – What I Changed and Why.”**

5. Create a photo essay with captions and a reflective note titled **"A Week of Green Habits."**

6 (a) Write a formal invitation inviting a renowned environmentalist to inaugurate your school’s Eco Club.

(b) Write an informal reply (regret) from the chief guest.

7.Write an article for a school magazine on “**Why Gender Equality Begins at Home.”**

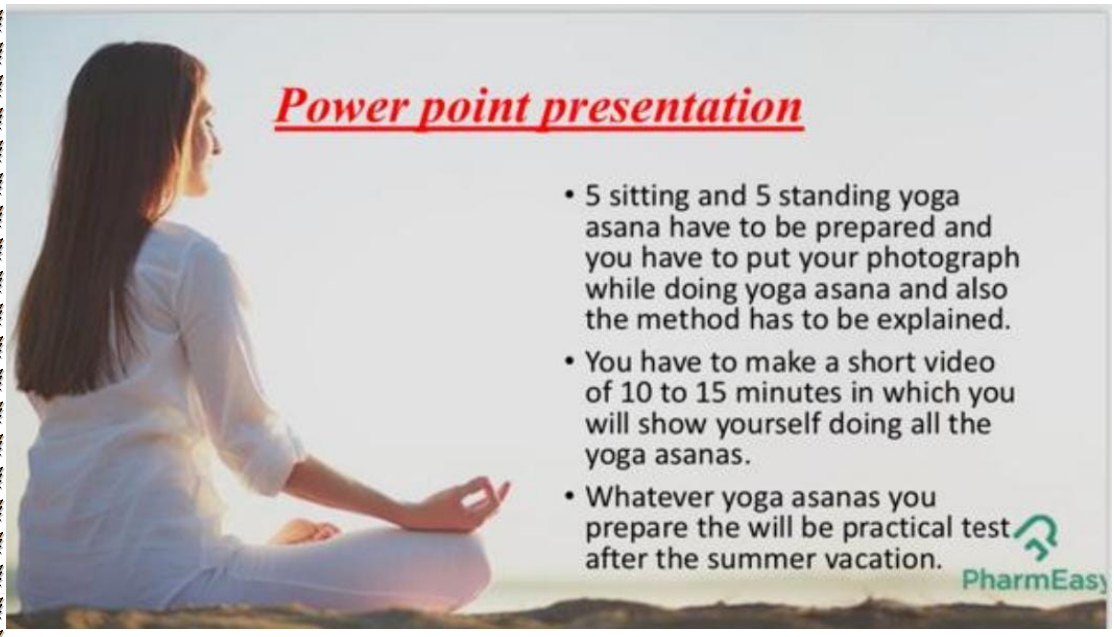
8.Write a report on the “Eco Awareness Rally” organized by your school in collaboration with local residents.

9.Interview a family/community member and document their experience of *gender roles across generations.*

10.“Mother Tongue: More Than Just a Language”

Discuss the emotional and cultural importance of one’s native language, connecting it to the events in “The Last Lesson.” (150–200 words)

Physical Education Homework



CURRENT AFFAIRS NEWS

- You Have To Make 15 Small Sheets In Which You Will Write Current Affairs News.
- All Of You Have To Write The Sports News From 5th To 20th June.
- Make The Sheets Creative By Showing Newspaper Cuttings (Photographs , Dates , Headlines).

Fine Arts Homework

I. **5 Sheets Advertisement**
II. **5 Sheets Social**
III. **5 Sheets Story**

(On Half Impiral Sheets with Water Colours)


Thankyou
Enjoy your
Holidays