DAV Model School Sec 15 A Chandigarh
Class XII
Summer Holiday's Homework (session - 2021-22)

ENGLISH

NOTE: DO ALL WORK IN ENGLISH REGISTER

1.READ THE ENGLISH NEWSPAPER DAILY AND CUT AND PASTE SAMPLES OF THE FOLLOWING IN THE FAIR REGISTER OF ENGLISH UNDERLINING IT WITH THE HOLIDAY HOMEWORK:

a) 3 REPORTS

b)3 ARTICLES (on coronavirus)

c)3 POSTERS (on fight coronavirus)

d) 5 CLASSIFIED ADVERTISEMENTS

2. WRITE AN ARTICLE ON TOPIC-

'HOW GOOGLE CONTROLS THE LIFE OF AN AVERAGE PERSON '? 150-200 WORDS

3. WRITE CHARACTER SKETCH OF THE FOLLOWING IN 120-150 words each :

a) FRANZ

b) M. HAMEL

c) Saheb

d) Mukesh

4. WRITE DETAILED SUMMARY OF WILLIAM SHAKESPEARE'S (ANY ONE) DRAMA

a) My mother at sixty six

b) Am elementary school classroom in a slum

SOURCE: WWW.sparksnote.com

5. UPDATE YOUR LITERATURE REGISTER WITH THE QUESTION-ANSWERS OF ALL THE CHAPTERS AND POEM DONE DURING ONLINE CLASSES.

6. LEARN AND REVISE ALL THE WORK DONE TILL NOW .

 # STAY HOME # STAY SAFE

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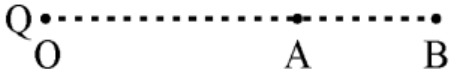
PHYSICS

UNIT -I

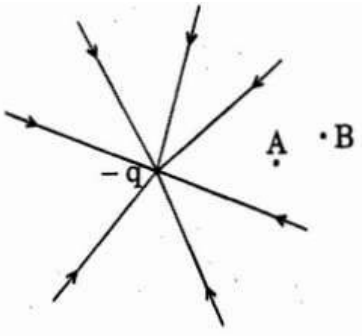
1. Two equal balls having equal positive charge 'q' coulombs are suspended by two insulating strings of equal length. What would be the effect on the force when a plastic sheet is inserted between the two ? (Increase or decrease)
   Note: Dielctric constant of plastic from 1.5 to 3.5 1
2. Why do the electrostatic field lines not form closed loops? 1
3. Why do the electric field lines never cross each other? 1
4. Why are electric field lines perpendicular at a point on an equipotential surface of a conductor? 1
5. A point charge +Q is placed at point O as shown in the figure. Is the potential difference $V_A - V_B$ positive, negative or zero ?

1

6. How does the electric flux due to a point charge enclosed by a spherical Gaussian surface get affected when its radius is increased ? 1
7. A point charge Q is placed at point O as shown in the figure. The potential difference VA – VB positive. Is the charge Q negative or positive?



8. Define Electric Flux. Write its SI unit. 1
9. Why do the electrostatic field lines not form closed loops ? 1
10. Use Gauss's law to prove that the electric field inside a uniformly charged spherical shell is zero. 1
11. A point charge +Q is placed in the vicinity of a conducting surface. Trace the field lines between the charge and the conducting surface. 1
12. The field lines of a negative point charge are as shown in the figure. Does the kinetic energy of a small negative charge increase or decrease in going from B to A ? 1



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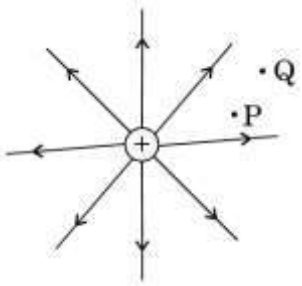
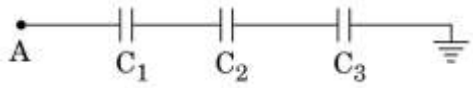
13. What is the electric flux through a cube of side 1 cm which encloses an electric dipole? 1
14. The figure shows the field lines of a positive point charge. What will be the sign of the potential energy difference of a small negative charge between the points Q and P? Justify your answer. 1

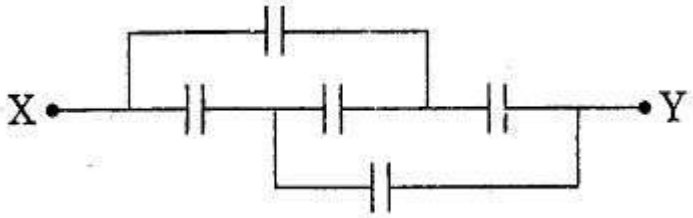


15. Plot a graph showing variation of capacitive reactance with the change in the frequency of the AC source. 1
16. Why are electric field lines perpendicular at a point on an equipotential surface of a conductor? 1
17. Define the term 'electric flux'. Write its SI units. What is the flux due to electric field $\vec{E} = 3 \times 10^3 \hat{\imath}$ N/C through a square of side 10 cm, when it is held normal to $\vec{E}$? 2
18. Calculate the potential difference and the energy stored in the capacitor C2 in the circuit shown in the figure. Given potential at A is 90 V, C1 = 20 μF, C2 = 30 μF and C3 = 15 μF.



2
19. A parallel plate capacitor of capacitance C is charged to a potential V. It is then connected to another uncharged capacitor having the same capacitance. Find out the ratio of the energy stored in the combined system to that stored initially in the single capacitor. 2
20. Define the term 'electric flux'. Write its SI units. What is the flux due to electric field $\vec{E} = 3 \times 10^3 \hat{\imath}$ N/C through a square of side 10 cm, when it is held normal to $\vec{E}$? 2
Ans. Electric flux = 30 Vm.
21. Find the equivalent capacitance of the network shown in the figure, when each capacitor is of1 $|i$F. When the ends X and Y are connected to a 6 V battery, find out

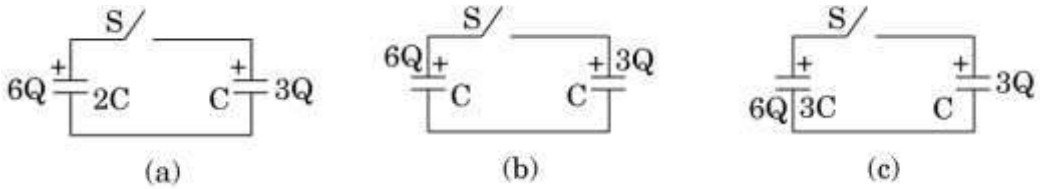
(i) the charge and (ii) the energy stored in the network.



3

Ans.= 2 μF.

22. Three circuits, each consisting of a switch 'S' and two capacitors, are initially charged, as shown in the figure. After the switch has been closed, in which circuit will the charge on the left-hand capacitor (i) increase, (ii) decrease and (iii) remain same ? Give reasons.



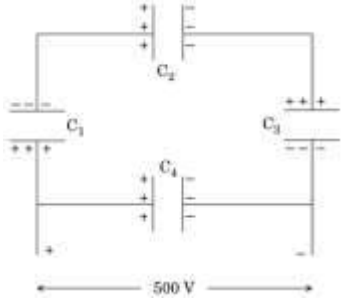
3

23. Two capacitors of capacitance 10 μF and 20 μF are connected in series with a 6 V battery. After the capacitors are fully charged, a slab of dielectric constant (K) is inserted between the plates of the two capacitors. How will the following be affected after the slab is introduced :
(a) the electric field energy stored in the capacitors
(b) the charges on the two capacitors
(c) the potential difference between the plates of the capacitors.
Justify your answer.

3

24. Two capacitors of unknown capacitances C1 and C2 are connected first in series and then in parallel across a battery of 100 V. If the energy stored in the two combinations is 0.045 J and 0.25 J respectively, determine the value of C1 and C2. Also calculate the charge on each capacitor in parallel combination. 3

25. A network of four 10 μF capacitors is connected to a 500 V supply as shown in the figure. Determine the
(a) equivalent capacitance of the network and
(b) charge on each capacitor.3



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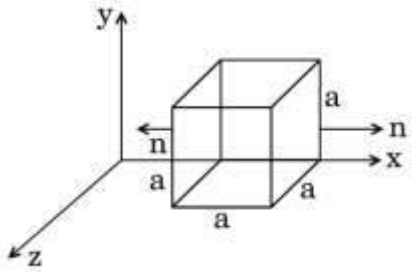
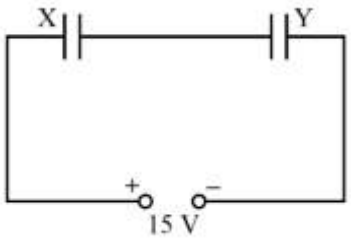
26. A charge is distributed uniformly over a ring of radius 'a'. Obtain an expression for the electric intensity E at a point on the axis of the ring. Hence show that for points at large distances from the ring, it behaves like a point charge.



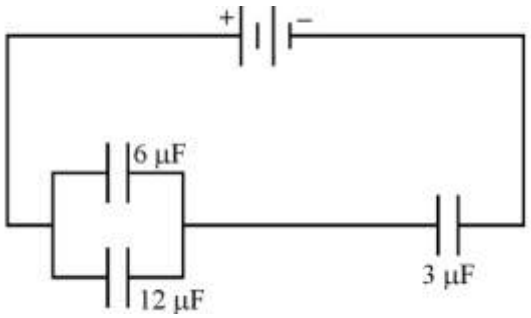
3

27. Two parallel plate capacitors X and Y have the same area of plates and same separation between them. X has air between the plates while Y contains a dielectric medium of $\varepsilon_r = 4$.
(i) Calculate capacitance of each capacitor if equivalent capacitance of the combination is 4 μF.
(ii) Calculate the potential difference between the plates of X and Y.
Estimate the ratio of electrostatic energy stored in X and Y. 3



28. (a) Define torque acting on a dipole of dipole moment $\vec{p}$ placed in a uniform electric field $\vec{E}$. Express it in the vector form and point out the direction along which it acts.
(b) What happens if the field is non-uniform ?
(c) What would happen if the external field $\vec{E}$ is increasing (i) parallel to $\vec{p}$ and (ii) anti-parallel to $\vec{p}$? 3

36. In the following arrangement of capacitors, the energy stored in the 6 μF capacitor is E. Find the value of the following: (i) Energy stored in 12 μF capacitor. (ii) Energy stored in 3 μF capacitor. (iii) Total energy drawn from the battery. 3



29. (a) Define the term 'electric flux'. Write its S.I. unit.

(b) Given the components of an electric field as Ex = αx, Ey = 0 and Ez = 0, where α is a dimensional constant. Calculate the flux through each face of the cube of side 'a', as shown in the figure, and the effective charge inside the cube.

OR

(a) Define equipotential surface. Why is the electric field at any point on the equipotential surface directed normal to the surface?

(b) Draw the equipotential surfaces for an electric dipole. Why does the separation between successive equipotential surfaces get wider as the distance from the charges increases?

(c) For this dipole, draw a plot showing the variation of potential V versus x, where x (x >> 2a), is the distance from the point charge – q along the line joining the two charges. 5

30. (a) An electric dipole of dipole moment $\vec{p}$ consists of point charges +q and –q separated by a distance 2a apart. Deduce the expression for the electric field $\vec{E}$ due to the dipole at a distance *x* from the centre of the dipole on its axial line in terms of the dipole moment $\vec{p}$. Hence show that in the limit *x* >> a, $\vec{E} \rightarrow 2\vec{p}/4\pi\epsilon_0 x^3$.

(b) Given the electric field in the region $\vec{E} = 2x\hat{\imath}$, find the net electric flux through the cube and the charge enclosed by it.

OR

(a) Explain, using suitable diagrams, the difference in the behaviour of a (i) conductor and (ii) dielectric in the presence of external electric field. Define the terms polarization of a dielectric and write its relation with susceptibility.

(b) A thin metallic spherical shell of radius R carries a charge Q on its surface. A point charge Q/2 is placed at its centre C and another charge +2Q is placed outside the shell at a distance *x* from the centre as shown in the figure. Find (i) the force on the charge at the centre of shell and at the point A, (ii) the electric flux through the shell.

5

31. (a) Derive the expression for the potential energy of an electric dipole of dipole moment $\vec{p}$ placed in a uniform electric field $\vec{E}$. Find out the orientation of the dipole when it is in (i) stable equilibrium, (ii) unstable equilibrium. (b) Figure shows a configuration of the charge array of two dipoles.

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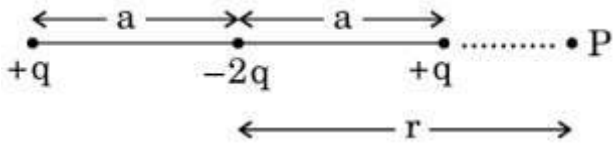


Obtain the expression for the dependence of potential on r for r >> a for a point P on the axis of this array of charges.

OR

(a) Define electric flux. Write its S.I. unit. (b) Using Gauss's law, obtain the electric flux due to a point charge 'q' enclosed in a cube of side 'a'. (c) Show that the electric field due to a uniformly charged infinite plane sheet at any point distant x from it, is independent of x.

5

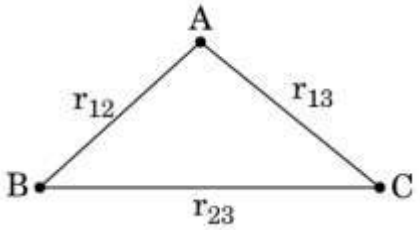
32. (a) Derive the expression for the energy stored in a parallel plate capacitor. Hence obtain the expression for the energy density of the electric field. (b) A fully charged parallel plate capacitor is connected across an uncharged identical capacitor. Show that the energy stored in the combination is less than that stored initially in the single capacitor. 5

33. State Gauss's law in electrostatics. Show, with the help of a suitable example along with the figure, that the outward flux due to a point charge 'q', in vacuum within a closed surface, is independent of its size or shape and is given by q/ε_o . (b) Two parallel uniformly charged infinite plane sheets, '1' and '2', have charge densities $+\sigma$ and -2σ respectively. Give the magnitude and direction of the net electric field at a point (i) in between the two sheets and (ii) outside near the sheet '1'.

OR

(a) Define electrostatic potential at a point. Write its S.I. unit. Three point charges q1, q2 and q3 are kept respectively at points A, B and C as shown in the figure. Derive the expression for the electrostatic potential energy of the system.

(b) Depict the equipotential surfaces due to (i) an electric dipole, (ii) two identical positive charges separated by a distance.



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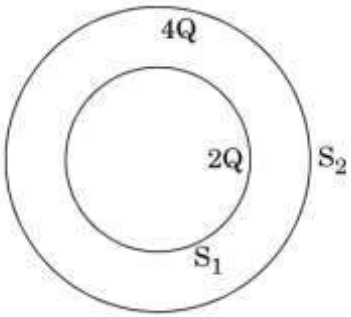
36. (a) Deduce the expression for the torque acting on a dipole of dipole moment $\vec{p}$ in the presence of a uniform electric field $\vec{E}$.

(b) Consider two hollow concentric spheres, S1 and S2, enclosing charges 2Q and 4Q respectively as shown in the figure.

(i) Find out the ratio of the electric flux through them.

(ii) How will the electric flux through the sphere S1 change if a medium of dielectric constant 'εr' is introduced in the space inside S1 in place of air ? Deduce the necessary expression.



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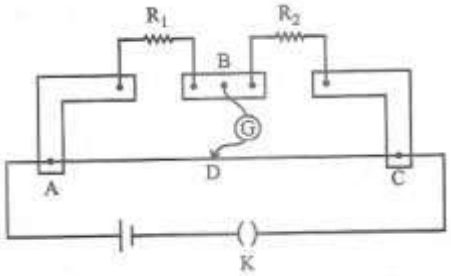
UNIT -II

1. (a) State Kirchhoff's rules for an electric network. Using Kirchhoff's rules, obtain the balance condition in terms of the resistances of four arms of Wheatstone bridge.

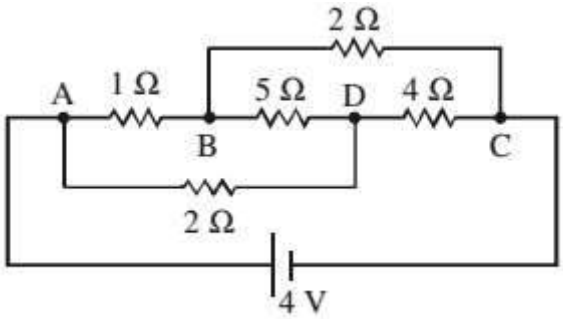
(b) In the meterbridge experimental set up, shown in the figure, the null point 'D' is obtained at a distance of 40 cm from end A of the meterbridge wire. If a resistance of 10 Ω is



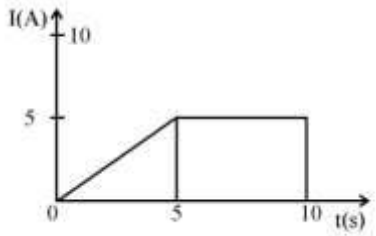
connected in series with R1, null point is obtained at AD=60 cm. Calculated the values of R1 and R2.

2. Answer the following : (a) Why are the connections between the resistors in a meter bridge made of thick copper strips ? (b) Why is it generally preferred to obtain the balance point in the middle of the meter bridge wire ? (c) Which material is used for the meter bridge wire and why?

3. Estimate the average drift speed of conduction electrons in a copper wire of cross-sectional area $1.0 \times 10^{-7}\, m^2$ carrying a current of 1.5 A. Assume the density of conduction electrons to be $9 \times 10^{28}\, m^{-3}$. 2
   Ans.1.04 x 10^{-3} m/s
4. A cell of emf 'E' and internal resistance 'r' is connected across a variable resistor 'R'. Plot a graph showing variation of terminal voltage 'V' of the cell versus the current 'I'. Using the plot, show how the emf of the cell and its internal resistance can be determined.
5. Calculate the current drawn from the battery by the network of resistors shown in the figure. 2



   Ans. 2A
6. (a) Deduce the relation between current I flowing through a conductor and drift velocity $\overrightarrow{v_d}$ of the electrons.
   (b) Figure shows a plot of current 'I' flowing through the cross-section of a wire versus the time 't'. Use the plot to find the charge flowing in 10s through the wire.



3

   Ans. 37.5 C

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8. With the help of the circuit diagram, explain the working principle of meter bridge. How is it used to determine the unknown resistance of a given wire? Write the necessary precautions to minimize the error in the result. 3

   Circuit Diagram.

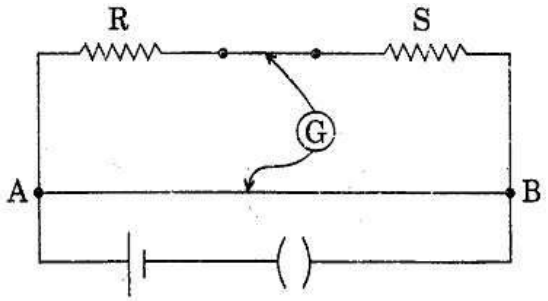
   Principle: Meter bridge works on the principle of wheatstone bridge.

   To find unknown resistance of wire, put wire in one of the gaps between copper strips and in other gap there is resistance box. Take some resistance from the resistance box and try to find balance point on the meter long wire. Find length on either side of balance point i.e. l cm and (100-l)cm. Then take ratio of resistances for balanced state of bridge and find the unknown resistance.

   Precaution: Balance point must be away from the edges.

9. Distinguish between emf and terminal voltage of a cell. 1

10. In a meter bridge shown in the figure, the balance point is found to be 40 cm from end A. If a resistance of 10 Ω is connected in series with R, balance point is obtained 60 cm from A. Calculate the values of R and S.



2

   Ans. R = 8Ω and S = 12 Ω

11. State KirchhofTs rules and explain on what basis they are justified. (i)Two cells of emfs E_1 and E_2 and internal resistances r_1 and r_2 are connected in parallel. Derive the expression for the emf and (ii) internal resistance of a single equivalent cell which can replace this combination.

   OR

   (a) "The outward electric flux due to charge + Q is independent of the shape and size of the surface which encloses it." Give two reasons to justify this statement. Two identical circular loops '1' and '2' of radius R each have linear charge densities - λ and + λ C/m respectively. The loops are placed coaxially with their centres R√3 distance apart. Find the magnitude and direction of the net electric field at the centre of loop '1'. 5

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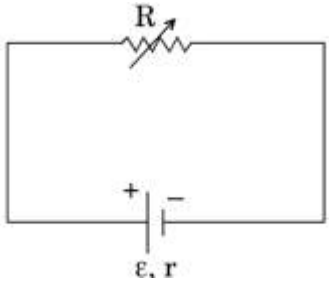
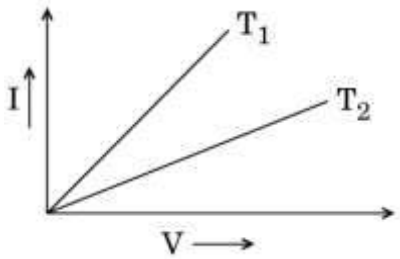
12. A variable resistor R is connected across a cell of emf ε and internal resistance r as shown in the figure. Draw a plot showing the variation of (i) terminal voltage V and (ii) the current I, as a function of R. 2

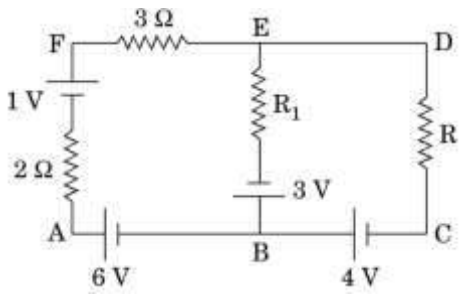


13. A potential difference V is applied across a conductor of length L and diameter D. How is the drift velocity, v_d, of charge carriers in the conductor affected when (i) V is halved, (ii) L is doubled and (iii) D is halved? Justify your answer in each case. 3

14. I – V graph for a metallic wire at two different temperatures, T1 and T2 is as shown in the figure. Which of the two temperatures is lower and why? 1

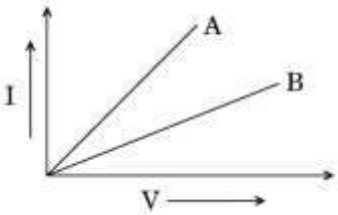


15. Use Kirchhoff's rules to determine the potential difference between the points A and D when no current flows in the arm BE of the electric network shown in the figure.



2

16. Two metallic resistors are connected first in series and then in parallel across a d.c. supply. Plot of I – V graph



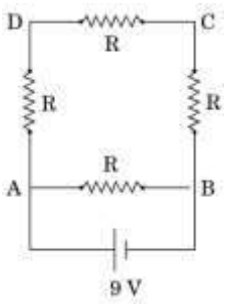
is shown for the two cases. Which one represents a parallel combination of the resistors and why? 1

17. Define the electric resistivity of a conductor.
Plot a graph showing the variation of resistivity with temperature in the case of a (a) conductor, (b) semiconductor.
Briefly explain, how the difference in the behaviour of the two can be explained in terms of number density of charge carriers and relaxation time. 3

18. A cell of emf 'E' and internal resistance 'r' is connected across a variable load resistor R. Draw the plots of the terminal voltage V versus (i) R and (ii) the current I. It is found that when R = 4 Ω, the current is 1 A and when R is increased to 9 Ω, the current reduces to 0.5 A. Find the values of the emf E and internal resistance r. 3

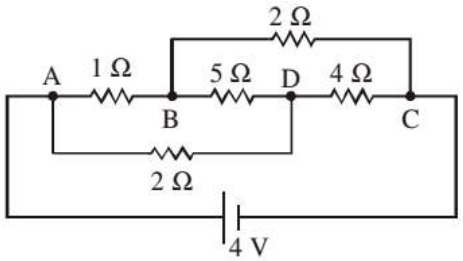
19. Two wires, one of copper and the other of manganin, have same resistance and equal thickness. Which wire is longer? Justify your answer. 1

20. A 16 Ω resistance wire is bent to form a square. A source of emf 9 V is connected across one of its sides as shown. Calculate the current drawn from the source. Find the potential difference between the ends C and D. If now the wire is stretched uniformly to double the length and once again the same cell is connected in the same way, across one side of the square formed, what will now be the potential difference across one of its diagonals?

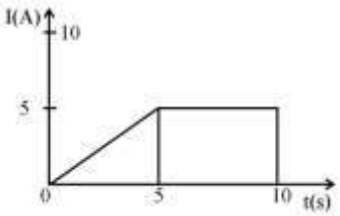


3

21. Calculate the current drawn from the battery by the network of resistors shown in the figure. 2



22. (a) Deduce the relation between current I flowing through a conductor and drift velocity → d of the electrons.



(b) Figure shows a plot of current 'I' flowing through the cross-section of a wire versus the time 't'. Use the plot to find the charge flowing in 10s through the wire. 3

23. With the help of the circuit diagram, explain the working principle of meter bridge. How is it used to determine the unknown resistance of a given wire ? Write the necessary precautions to minimize the error in the result. 3

ALL NCERT QUESTIONS and EXAMPLES from CHAPTERS 1-3.

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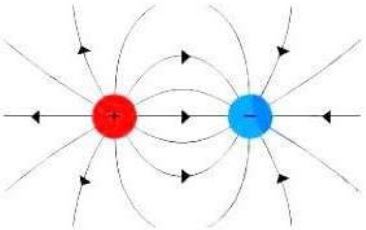
Competency based 1. (Case Study based Questions):

Electric charge is the physical property of matter that causes it to experience a force when placed in an electromagnetic field. There are two types of charges positive and negative charges. Also, like charges repel each other whereas unlike charges attract eacl other.



i. Charge on a body which carries 200 excess electrons is:
   a. -3.2×10^{-18} C
   b. 3.2×10^{18} C
   c. -3.2×10^{-17} C
   d. 3.2×10^{-17} C

ii. Charge on a body which carries 10 excess electrons is:
   a. -1.6×10^{-18} C
   b. 1.6×10^{-18} C
   c. 2.6×10^{-18} C
   d. 1.6×10^{-21} C

iii. Mass of electron is:
   a. 9.1×10^{-31} kg
   b. 9.1×10^{-31} g
   c. 1.6×10^{-19} kg
   d. 1.6×10^{-19} g

iv. A body is positively charged, it implies that:
   a. there is only a positive charge in the body
   b. there is positive as well as negative charge in the body but the positive charge is more than negative charge
   c. there is equally positive and negative charge in the body but the positive charge lies in the outer regions
   d. the negative charge is displaced from its position

v. On rubbing, when one body gets positively charged and other negatively charged, the electrons transferred from positively charged body to negatively charged body are:
   a. valence electrons only
   b. electrons of inner shells
   c. both valence electrons and electrons of the inner shell.
   d. none of the above

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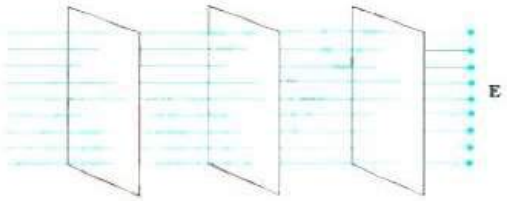
Competency based 2. (Case Study based Questions)

When an object is moved against the electric field it gains some amount of energy which is defined as the electric potential energy. For any charge, the electric potential is obtained by dividing the potential energy by the quantity of charge and the surface which is the locus of all points which are at the same potential is known as the equipotential surface.



Equipotential Surfaces for a uniform electric field

i. Equipotentials at a great distance from a collection of charges whose total sum is not zero are approximate:
   a. spheres
   b. planes
   c. paraboloids
   d. ellipsoids

ii. Work done in carrying an electron from A to B lying on equipotential surface on o volt potential is
   a. 1 eV
   b. 10 eV
   c. 1 volt
   d. Zero

iii. Electric potential is:
   a. scalar
   b. vector
   c. both
   d. none of these

iv. The shape of the equipotential surface for a point charge:
   a. sphere
   b. rectangular
   c. circle
   d. irregular

v. Electric potential due to the electric dipole is:
   a. spherically symmetric
   b. cylindrically symmetric
   c. irregular distributed
   d. none of these

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- **Art integration Activity Project:**

Prepare A PPT from the topics we covered in unit I and II, relating them with daily life.
(For 5 min presentation)

List of Practicals to be written in practical note book (Only Pen Work) as instructed in class:

Verification of Ohm's law, to find resistance per cm
To find resistivity by meter bridge
To verify laws of combinations of resistances using meter bridge
To compare emf's of two cells using potentiometer
To find internal resistance of a cell using potentiometer
To study V-I characteristic of diode.
To draw the characteristics of Zener diode.
To find resistance of galvanometer using half deflection method
To convert galvanometer into voltmeter
To find refractive index using travelling microscope
To find focal length of convex lens

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To find focal length of concave mirror
To find angle of minimum deviation of prism
To find focal length of convex mirror using convex lens
To find focal length of concave lens using convex lens.

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MATHEMATICS

Q.1). Show that the relation R in the set A = {1,2,3, 4,5} given by R=(a,b): a-b is even} is an equivalence relation.

Q.2) Show that the relation R in R defined by R={(a , b) : a ≤ b } , is reflexive and transitive but not symmetric.

Q.3)Let A= R −{3} and B = R−{1} , Consider the function f: A → B defined by f (x) = (x-2)/(x-3) . Show that f is one–one and onto

Q4) Let A ={1,2}. How many one one functions from A to A are possible Also write them

Q5 Let A ={1,2}. How many onto functions from A to A are possible? Also write them.

Q6) LetA ={-1,0,1} and f={(x,x^2): x ∈A }.Show that f : A → A is neither one one nor onto

Q7) Show that f: N →N defined by f (x) = {n + 1/2 , if n is odd
{ n/2, if n is even

Is many- one onto function.

Q8) Show that the function f: R → R defined by f (x) = 3x^3 + 5 for x ∈ R is a bijection.

Q9)1 Show that the relation R on the set R of all real numbers, defined as R = {(a, b): a ≤ b^2 } is neither reflexive nor symmetric nor transitive

Q10) Find gof and fog when f: R→R and g: R→R are defined by f(x)=$x^2 + 2$ and g(x) = $\frac{x}{x^2+1}$

Q11) Find the principle value of

a) $\sin^{-1}\frac{1}{\sqrt{2}}$

b) $\cos^{-1}\frac{-1}{\sqrt{2}}$

c) $\tan^{-1}\frac{-1}{\sqrt{3}}$

d) $\csc^{-1}-2$

Q12) Express the matrix $\begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{bmatrix}$ as a sum of symmetric and skew symmetric matrix

Q13)If A = $\begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & 5 & 3 \\ 3 & 4 & 3 \\ 7 & 6 & 8 \end{bmatrix}$ Find (AB) $'$ and verify that (AB) $'$ =B'A'

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Q14) if A = $\begin{bmatrix} 2 & 3 & -5 \\ -6 & -8 & -3 \\ -4 & 8 & 9 \end{bmatrix}$ and B== $\begin{bmatrix} 5 & 6 & -7 \\ -9 & 0 & -6 \\ -1 & 0 & 9 \end{bmatrix}$ write the sum of diagonal elements of A and non diagonal elements of B

Q15) Construct a 2x2 matrix which is symmetric and skew symmetric matrix.

Q16) Construct a matrix, Then find A+A' and A-A′ and check which of them is symmetric and skew Symmetric , Write the conclusion.

Q17) If A= $\begin{bmatrix} 1 & 5 & 3 \\ 3 & 4 & 3 \\ 7 & 6 & 8 \end{bmatrix}$ find A^2 +3A+5I Where I is Identity matrix of order 3.

Q18) If A= $\begin{bmatrix} 0 & 0 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ Check A^3 = A. TRUE OR FALSE.

Q19) If A= $\begin{bmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1, & 1 \end{bmatrix}$ Find A^{-1} using elementary transformation.

Q20) Write the number of all possible matrices of order 2x3 if each element is

Filled by 0 or 1.

Q21) Define square matrix, scalar matrix, diagonal matrix , transepose of a matrix.

Q22)If A and B are skew symmetric matrices of same order then check AB+BA is skew symmetric or not

.

Q23)The cost of 4 Kg onion,3kg wheat and 2kg rice is Rs 60.The cost of 2 kg onion,4kg wheat and 6kg rice is Rs 90.The cost of 6kg onion,2kg wheat and 3kg rice is Rs 70.Find the cost of each per kg by matrix method

Q24) 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 Rs x each, Rs y each and Rs z each for the three respective values to its 3,2 and 1 students with a total award money of Rs1000.School Q wants to spend Rs 1500 to award its 4,1 and 3 students on the respective values .If the total amount of award for

one prize on each value is Rs 600 ,using matrices ,find the award money for each value.

Q25) The sum of three numbers is 6.If we multiply third number by 3 and add second number to it, we get 11.By adding first and third numbers, and we get double of the second number. Represent algebraically and find the numbers using matrix method

Competency based questions

In two different societies, there are some school going students - including girls as well as boys. Satish forms two sets with these students, as his college project. Let A= a_1, a_2 , a_3 , a_4, a_5 = { 1 2 3 4 5} and B b_1 , b_2 , b_3 , b_4 ={ 1 2 3 4} where a_i 's and b_i 's are the school going students of first and second society respectively. Satish decides to explore these sets for various types of relations and functions.

1. Satish wishes to know the number of reflexive relations defined on set A. How many such relations are possible?

A 0
B 2^5
C 2^{10}
D 2^{20}

2 Let R : A →A, R (x, y) : x and y are students of same sex} . Then relation R is
(a) reflexive only
(b) reflexive and symmetric but not transitive
(c) reflexive and transitive but not symmetric
(d) an equivalence relation

3 Satish and his friend Rajat are interested to know the number of symmetric relations defined on both the sets A and B, separately. Satish decides to find the symmetric relation on set A, while Rajat decides to find the symmetric relation on set B. What is difference between their results?
(a) 1024
(b)2^{10} (15)
(c) 2^{10} (31)
(d) 2^{10} (63)

4 To help Satish in his project, Rajat decides to form onto function from set A to B. How many such functions are possible?
(a) 342

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(b) 243
(c) 729
(d) 102

Manjit wants to donate a rectangular plot of land for a school in his village. When he was asked to give dimensions of the plot, he told that if its length is decreased by 50 m and breadth is increased by 50 m, then its area will remain same, but if length is decreased by 10 m and breadth is decreased by 20 m, then its area will decrease by 5300 m^2

1. The equations in terms of x and y are
(a) x-y = 50, 2x-y =550
(b) x-y= 50, 2x-y=550
(c) x-y=50, 2x-y = 550
(d) x-y= 50, 2x-y=550

2. The value of x (length of rectangular field), is
(a) 150 m (b) 400 m
(c) 200 m (d) 320 m

3. The value of y (breadth of rectangular field), is
(a) 150 m (b) 200 m
(c) 430 m (d) 350 m

4. How much is the area of rectangular field?
(a) 60000 Sq. m (b) 30000 Sq. m
(c) 30000 m (d) 3000 m

Project Work

- Do five practicals guided by the teacher in class

Art integrated work

- Draw the graph of Sinx, $\sin^{-1} x$, cosx, $\cos^{-1} x$, $\tan x$, $\tan^{-1} x$,$\sec^{-1} x$,$\sec x$,cossecx,$\csc^{-1} x$,cotx,$\cot^{-1} x$ Logx,$|x|$,greatest integer function by using colored sheets and colored sketch-pen
- Write their Domain and range of above functions.

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CHEMISTRY

- Case study based questions:

CASE STUDY 1:

A Lead storage battery is the most important type of secondary cell having a lead anode and a grid of lead packed with PbO_2 as cathode. A 38% solution of sulphuric acid is used as electrolyte. (Density=1.294 g mL-1)The battery holds 3.5 L of the acid. During the discharge of the battery, the density of H_2SO_4 falls to 1.139 g mL-1. (20% H_2SO_4 by mass)

(1) Write the reaction taking place at the cathode when the battery is in use.

(2) How much electricity in terms of Faraday is required to carry out the reduction of
one mole of PbO_2?

(3) What is the molarity of sulphuric acid before discharge?

(4) Lead storage battery is considered a secondary cell. Why?

(5) Write the products of electrolysis when dilute sulphuric acid is electrolysed using
Platinum electrodes.

CASE STUDY 2:

The properties of the solutions which depend only on the number of solute particles but not on the nature of the solute are called colligative properties. Relative lowering in vapour pressure is also an example of colligative properties.

For an experiment, sugar solution is prepared for which lowering in vapour pressure was found to be 0.061 mm of Hg. (Vapour pressure of water at 200°C is 17.5 mm of Hg)

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Relative lowering of vapour pressure for the given solution is

(a) 0.00348

(b) 0.061

(c) 0.122

(d) 1.75

(ii) The vapour pressure (mm of Hg) of solution will be
(a) 17.5
(b) 0.61
(c) 17.439
(d) 0.00348

(iii) Mole fraction of sugar in the solution is
(a) 0.00348
(b) 0.9965
(c) 0.061
(d) 1.75

or

If weight of sugar taken is 5 g in 108 g of water then molar mass of sugar will be
(a) 358
(b) 120
(c) 240
(d) 400

(iv) The vapour pressure (mm of Hg) of water at 293K when 25g of glucose is dissolved in 450 g of water is
(a) 17.2
(b) 17.4
(c) 17.120
(d) 17.02

- Competency Based questions:

1. If the atoms of an element have the radius 'r', then in a primitive unit cell, calculate
(i) the length of the face diagonal
(ii) The length of the body diagonal
2. Diamond and solid rhombic sulphur both are covalent solids but the latter has very

low melting point than the former. Why
3. Sodium metal is quite soft where as sodium chloride crystals are quite hard. Explain.
4. Why is coordination number of 12 not found in ionic crystals.
5. In a crystal, Frenkel defect is not shown by alkali metal halides , but Silver halide
show. Why?
6.Why is it not possible to obtain pure ethanol by fractional distillation? What general name is given to binary mixtures which show deviation from Raoult's law and whose components cannot be separated by fractional distillation.
How many types of such mixtures are there?
7. How can you remove the hard calcium carbonate layer of the egg without damaging its semipermeable membrane? Can this egg be inserted into a bottle with a narrow neck without distorting its shape? Explain the process involved.
8. Why is the mass determined by measuring a colligative property in case of some solutes abnormal ? Discuss it with the help of Van't Hoff factor.
9. Addition of HgI2 to KI (aq.) shows decrease in vapour pressure. Why?
10. Account for the following :–
(a) CaCl2 is used to clear snow from roads in hill stations.
(b) Ethylene glycol is used as antifreeze solution in radiators of vehicles in cold countries.
(c) The freezing point depression of 0.01 m NaCl is nearly twice that of 0.01 m glucose
solution

- Art integration Activity Project:

Make 1 powerpoint presentation and 1 video on two different topics from the following [PowerPoint Presentation should have 5-10 slides][duration of video should be of 2-3minutes]:
Topics for even roll no.s

1. Close Packing in Solids
2. Rusting of Iron
3. Henry's Law and it's applications
4. Chemistry in Everyday Life

Topics for odd roll no.s

1. Defect in Solids

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2. Fuel Cells
3. Osmosis, Reverse Osmosis and it's importance
4. Chemistry in Everyday Life

- Practical work:

Complete Practical File-

1. Titration-M/20 Mohr's salt Vs potassium permanganate,M/40 Mohr's salt Vs potassium permanganate(for those who have already written can ignore)
2. Salts-To analyse the given salt (a)Ammonium chloride(b)Lead acetate .For one cation and anion. Write Systematically (refer to google classroom for help)

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COMPUTER SCIENCE WITH PYTHON

Topic -PYTHON FUNCTIONS

Q1. What are functions? What is the need of using functions?

Q2. What are arguments and parameters?

Q4. What is the difference between keyword and positional arguments?

Q5. Explain the difference between global and local variable with the help of an example.

Programs(Do any 15 questions from Q6-Q25)

Q6. Write a Python function that takes a number as an argument and print its square.

Q7. Write a Python function that takes a number as an argument and prints "ODD" if the number is odd otherwise prints "EVEN".

Q8. Write a Python function that takes a number as an argument and print the sum of all numbers from 1 till that number.

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Q9. Write a Python function that takes a number as an argument and returns the factorial of that number.

Q10. Write a Python function calc_pow(num1 , num2) that calculates the power of num1 to num2.

Q11. Write a Python function that takes a list of numbers as parameters and displays those numbers that are divisible by 100.

Q12. Write a Python function that takes a list of numbers and a number as an argument and return 1 if the number is present in the list otherwise return 0.

Q13. Write a Python function that takes a list as parameter and returns the sum of all numbers that are even.

Q14. Write a Python function a number as an argument and returns "PALINDROME" if the number is a palindrome otherwise return "NOT A PALINDROME". Also write a program to invoke this function.

Q15. Write a Python function that takes a string as an argument and count the number of vowels and consonants in it. Also write a program to invoke this function.

Q16. Write a Python function that takes a string as an argument and replace all capital alphabets with small alphabets. Also write a program to invoke this function.

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Q17. Write a Python function that takes a string as an argument and count the occurrences of word "The/the" in it. Also write a program to invoke this function.

Q18. Write a Python function that takes a list of numbers as an argument and display the maximum and minimum numbers present in the list. Also write a program to invoke this function.

Q19. Write a Python function that takes a list of numbers as an argument and display the count of positive and negative numbers present in the list. Also write a program to invoke this function.

Q20. Write a Python function that takes a list of strings as an argument and displays the strings which starts with "A" or "a". Also write a program to invoke this function.

Q21. Write Python script to create a dictionary with famous monuments and their location. Write a function that accepts name of any monument and dictionary of monuments as an argument and check whether that monument is present in the dictionary or not. If the monument is not present in the dictionary then add it to the dictionary.

Q22. Write Python script to create a dictionary with players name and their score. Write a function that accepts this dictionary as an argument and displays the name of the player with highest score.

Q23. Write a complete menu driven calculator program that inputs two numbers and an operator(+,-,*,**) and perform the desired operation. Write separate functions to perform each of the above operations.

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Q24. Write a complete menu driven program to create a dictionary containing ProductNo, ProductName and ProductPrice and perform the following operations:

Add a new product

Modify the existing product

Delete a product from the dictionary

Display the dictionary

Display the items of the dictionary in ascending order of ProductPrice

Write separate functions to perform the above operations.

Q25. Write a function that accepts a list of names as parameter and count the names that are palindromes. Also write a program to invoke this function.

Questions based on text file handling

Q1. What is the difference between text and binary files?

Q2. Compare and contrast read(), readline() and readlines().

Q3. How is write() different from writelines()?

Q4. Explain various modes available in file handling?

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Q5. Explain the difference between write and append mode of opening a file.

Programs (Do any 10 programs)

Q6. Write a Python script to read a text file "Quotes.txt" and display only those lines that start with "E".

Q7. Write a Python script to read a text file "XYZ.txt" and count the number of lines which are comments (i.e. which start from "#").

Q8. Write a program to read a text file and display the words not starting with uppercase vowel.

Q9. WAP to read a text file and count number of lines staring by character inputted by user.

Q10. WAP to read a text file and to count number of times word "the" appears in file.

Q11. WAP to read a text file and count the number of lines ending with vowels.

Q12. Write a function to count the number of uppercase and lowercase alphabets and digits present in a text file "STORY.TXT".

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Q13. Write a function to count the number of characters, words and lines present in a text file "STORY.TXT".

Q14. Write a program that reads a text file and displays the list of frequencies of words in it.

Q15. Write a program that reads a text file and displays all words which are less than 4 characters long.

Q16. Write a program to read a text file and create another text file toggling the case of all alphabets present in that file.

Q17. Write a program to read a text file and create another text file after deleting all occurrences of the words ending with "ing".

Q18. Write a program to read a text file and create another text file replacing every occurrence of consecutive blank spaces by a single space.

Q19. Write a program that reads a text file and count the number of words starting with "sh".

Q20. Write a program that reads a text file and create a new file after adding "ing" to all words ending with "t", "p" and "d".

CASE STUDY BASED/SOURCE-BASED INTEGRATED QUESTIONS (Do any 4)

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1. Traffic accidents occur due to various reasons. While problems with roads or inadequate safety lead to some accidents, the majority of the accidents are caused by drivers carelessness and their failure to abide by traffic rules.

ITS Roadwork is a company that deals with manufacturing and installation of traffic lights so as to minimize the risk of accidents. Keeping in view the requirements, traffic simulation is to be done. Write a program in Python that simulates a traffic light. The program should perform the following :

(a) A user-defined function traffictight() that accepts input from the user, displays an error message if the user enters anything other than RED YELLOW and GREEN Function lighti() is called and the following is displayed depending upon return value from light()

(i) "STOP, Life is more important than speed" if the value returned by light() is 0.

(ii) " PLEASE GO SLOW " if the value returned by light() is 1.

(iii) "You may go now." if the value returned by light() is 2.

(b) A user defined function light() that accepts a string as input and returns 0 when the input is RED 1 when the input is YELLOW and 2 when the input is GREEN. The input should be passed as an argument

(c) Display "BETTER LATE THAN NEVER" after the function trafficlight() is executed.

2. Kids Elementary is a playway school that focuses on 'Play and learn' strategy that helps toddlers understand concepts in a fun way. Being a senior

programmer, you have taken responsibility to develop a program using user-defined functions to help children differentiate between upper case and lower case letters/English alphabet in a given sentence. Make sure that you perform a careful analysis of the type of alphabets and sentences that can be included as per age and curriculum.

Write a Python program that accepts a string and calculates the number of upper case letters and lower case letters.

3. Ceremony Tent House manufactures tents as per the user's requirements. The shape of the tent is cylindrical surmounted by a conical top.The company performs the following tasks to fix the selling price of each tent .

(a) Accept user requirements for the tent, such as

- height
- radius
- slant height of the conical part

(b) Calculate the area of the canvas used.

(c) Calculate the cost of the canvas used for making the tent.

(d) Calculate the net amount payable by the customer that is inclusive of 18% tax

The company has developed a computerized solution for a quick and accurate calculation of the payable amount. Write a Python program to calculate the cost of tent function definition.

4. Gurukul Academy uses "Student Management information System (SMIS) to manage student related data. This system provides facilities for :

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1. recording and maintaining personal details of students,
2. maintaining marks scored in assessments and computing results of students,
3. keeping track of student attendance, and
4. managing many other student-related data

Let us automate this process step by step.

identify the personal details of students from your school identity card and write program using a

user-defined function to accept these details for all students of your school an display them in the following format:

School Name	
Name: ABC	Roll No: 25
Age: 16	Class: XII
Address: Address line1	State: Delhi
Pin Code: 999999	

5. On the basis of the above scenario, write a user-defined function to:

- Accept the marks of the student in five major subjects in Class XII and display the same.
- Calculate the sum of the marks of all subjects.
- Divide total marks by number of subjects, i.e., 5, and calculate and display the percentage
  (percentage total marks/5).

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- Find the grade of the student as per the following criteria:

Criteria	Grade
percentage > 90	A
percentage 90 and > =80	B
percentage 80 and >= 70	C
percentage < 70 and >= 60	D
percentage 60 and >= 40	E
percentage <40	RETEST

6. Gurukulam Academy is transforming its result processing unit into computerized "Student Management System". Help the institution to develop an integrated solution using concepts of Python List for adding new students to the existing list of students on the basis of marks obtained by them. (We assume the marks of ten students in the class.)

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The entire processing system should support adding of updated marks, deleting the marks of students who have left the institution, followed by generating a report by arranging the marks of all the students in both ascending and descending order.

It should also include insertion and deletion of students' marks at desirable position. Develop a Python program for the above scenario-based implementation.

Project work : Make a Graphical user Interface using Tkinter Library.(self study)

Art Integration :

- Make a wall hanging on operators using waste/old cd's
- Create infographics on Python Libraries (use canva app)

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PHYSICAL EDUCATION

- ***PROJECT :-***

TOPIC :- Yoga & LIFESTYLE

a) Meaning Of YOGA.

b) Asanas as preventive measures.

c) Benefits of Asanas.

d) Explain the procedure, benefits, and precautions and contraindications of :-

- Hastottanasana, Trikonasana, Chakrasana, Ardha matsyendrasana, Paschimottasana, Pawan muktasana, Sukhasana, Gomukhasana, Parvatasana, Tadasana, Ardha Chakrasana, Shavasana, Vakrasana, Shalabhasana.

e) Paste pictures related to the Asanas.

2. Make A File :-

a) Write about a game :- FOOTBALL.

b) Rules and Regulations of the game.

c) Measurements

d) Draw a diagram of FOOTBALL ground.(ART INTEGRATION)

e) Paste relevant pictures.

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3. MULTIPLE CHOICE AND VALUE - BASED QUESTIONS :-

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MULTIPLE CHOICE QUESTIONS

1. Yogasutra was compiled by : (C.B.S.E.)
   (a) Patanjali (b) Gheranda
   (c) Shivananda (d) Svatmarama
2. According to Patanjali, the definition of Asana is (C.B.S.E.)
   (a) control of sense organs (b) sitting in a cross-legged position
   (c) sitting in a comfortable position (d) control of diet and water intake.
3. How many types of Asanas are there in Yoga ? (C.B.S.E.)
   (a) 3 (b) 4
   (c) 5 (d) 12
4. Which Asana is good for the performance of the Excretory System ? (C.B.S.E.)
   (a) Sukhasana (b) Tadasana
   (c) Pawanmuktasana (d) Virabhadrasana
5. Which asana can be practiced immediately after eating food ?
   (a) Hastottanasana (b) Trikonasana
   (c) Ardhamatsyendrasana (d) Vajrasana
6. In Hastottanasana, 'Hast' means
   (a) Abdomen (b) Chest
   (c) Arms (d) Head
7. In Sanskrit, Trikon word means :
   (a) Square (b) Rectangle
   (c) Circle (d) Triangle
8. Bhujangasana is also called as :
   (a) Cobra pose (b) Tiger pose
   (c) Peacock pose (d) Cow pose
9. This asana assists in releasing trapped digestive gas from the stomach and intestines :
   (a) Paschimottanasana (b) Pawan Muktasana
   (c) Shavasana (d) Sarvangasana
10. In this asana, the body takes shape of a floating fish :
    (a) Paschimottanasana (b) Matsyasana
    (c) Shavasana (d) Sarvangasana
11. It resembles a dead body :
    (a) Pawanmuktasana (b) Matsyasana
    (c) Shavasana (d) Sarvangasana

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12. According to WHO, the criteria for overweight as per BMI is (C.B.S.E.)
(a) 18.5 – 24.9 (b) 25 -29.9
(c) 30 – 34.9 (d) 35-39.9

13. Which asana improves efficiency of liver ? (C.B.S.E.)
(a) Vajrasana (b) Makrasana
(c) Ardhamatsyendrasana (d) Tadasana

14. Which asana is suggested to relax muscles after performing Vajrasana ? (C.B.S.E.)
(a) Sukhasana (b) Savasana
(c) Sarvangasana (d) Virabhadrasana

15. If BMI is 30 or higher; the person is in the :
(a) overweight category (b) underweight category
(c) normal weight category (d) obese category

16. The fundamental cause of obesity and over-weight is :
(a) Malnutrition (b) Balanced diet
(c) imbalance between calories consumed and calories expended
(d) All the above

17. In which disease, blood glucose, or blood sugar levels are too high ?
(a) Obesity (b) Diabetes
(c) Hypertension (d) Sinusitis

18. Most of what we eat is broken down into :
(a) Amino acids (b) Glucose
(c) Carbon (d) Nitrogen

19. Which type of diabetes occurs during pregnancy ?
(a) Type 1 (b) Type 2
(c) Gestational (d) Type 4

20. Which gland is associated with Diabetes ? (C.B.S.E.)
(a) Endocrine glands (b) Pituitary
(c) Pancreas (d) Hypothalamus

21. Polyurea is associated with : (C.B.S.E.)
(a) excessive sweat (b) less urination
(c) excessive saliva (d) excessive urination

22. Bhujangasana is also known as (C.B.S.E.)
(a) Dog posture (b) Child posture
(c) Cobra posture (d) Reverse Boat posture

23. Which disease occurs when pancreas is unable to make enough insulin ?
(a) Obesity (b) Diabetes
(c) Hypertension (d) Sinusitis

24. Symptoms such as coughing, wheezing, shortness of breath and/or chest tightness are caused in patients suffering from :

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(a) Diabetes (b) Obesity
(c) Asthma (d) Back pain

25. What causes an Asthma Attack ? (C.B.S.E.)
(a) Allergy (b) Smoke
(c) Exercise (d) All of the above

26. Which asana is base asana for curing Asthma ? (C.B.S.E.)
(a) Sukhasana (b) Chakrasana
(c) Matsyasana (d) Parvatasana

27. Triggers such as pollen, dust can cause attack of :
(a) Heart (b) Migraines
(c) Back pain (d) Asthma

28. The force of our blood pushing against the walls of our arteries is called as :
(a) Cardiac output (b) Blood pressure
(c) Heart rate (d) VO_2 Max

29. What is considered as normal blood pressure ?
(a) 100/80 (b) 180/120
(c) 140/90 (d) 120/80

30. At what point is Blood pressure considered high : (C.B.S.E.)
(a) 80/120 (b) 130/80
(c) 140/90 (d) 210/120

31. The asanas which help to increase the concentration power are called as :
(a) Relaxative asanas (b) Cultural asanas
(c) Dhyanatmak asanas (d) Corrective asanas

32. Which of the following asanas gives a posterior stretch to the spinal column ?
(a) Sukhasana (b) Paschimottanasana
(c) Shavasana (d) Gomukhasana

33. Which asana is known as Mountain Pose ?
(a) Matsyasana (b) Tadasana
(c) Parvatasana (d) Shalabhasana

34. Which of the following can be a risk factor for diabetes ?
(a) Obesity (b) Asthma
(c) Regular Exercise (d) All of the above

35. Which system of the body is affected in Asthma ?
(a) Circulatory System (b) Respiratory System
(c) Endocrine System (d) Musculoskeletal System

36. Which type of hypertension appears suddenly, due to an underlying condition ?
(a) Secondary Hypertension (b) Primary Hypertension
(c) Tertiary Hypertension (d) None of the above

37. Which of the following is not a cause of Obesity ?
(a) Lack of Physical activity (b) Genetics
(c) Balanced diet (d) Psychological factors

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38. Which of the following asana should be performed for curing Obesity ? (C.B.S.E. SQP 2020)
(a) Trikonasana (b) Bhujangasana
(c) Pawanmuktasana (d) Tadasana

39. Which amongst these is a sitting asana ? (C.B.S.E. SQP 2020)
(a) Ardh-Matsyendrasana (b) Padahastasana
(c) Ardh Chakrasana (d) Trikonasana

40. Given below are the two statements labeled Assertion (A) and Reason (R) :
A: Asthma is a cardiac condition.
R: Asthma is a condition that causes occasional breathing difficulties which is caused by swelling of the breathing tubes that carry air in and out of the lungs.
In the context of above two statements, which one of the following is correct ?
(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.

41. One of the possible causes for Obesity could be ? (C.B.S.E. Sample Paper, 2021)
(a) Heredity (b) Excessive eating
(c) Fast metabolism (d) Both (a) & (b)

42. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R):
Assertion (A): Blood pressure is also used as a guide to the efficiency of the heart and blood vessels. Normal values are 120 mm/80 mm.
Reason (R): At systole, when the heart thrusts from the left ventricle into the aorta, the pressure is 120 mm. At diastole, the left ventricle is being refilled, the pressure is 80 mm.
In the context of the above statements, which one of the following is correct ?
(a) Both (A) and (R) are right, but (R) is not the correct explanation of (A).
(b) Both (A) and (R) are right and (R) is the correct explanation of (A).
(c) (A) is right, but (R) is wrong.
(d) (A) is wrong, but (R) is right.

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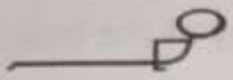
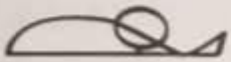
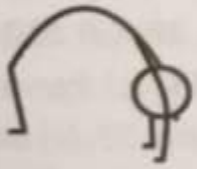
14. Identify the below given Asanas and write the names :

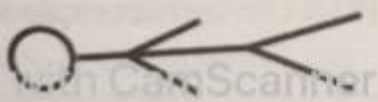
(a)  .....

(b)  .....

(c)  .....

(d)  .....

(e)  .....

(f)  .....

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15. Identify the below given asanas and write their names :

(a)  .....

(b)  .....

(c)  .....

16. Identify the below given asanas and write their names :

(a)  .....

(b)  .....

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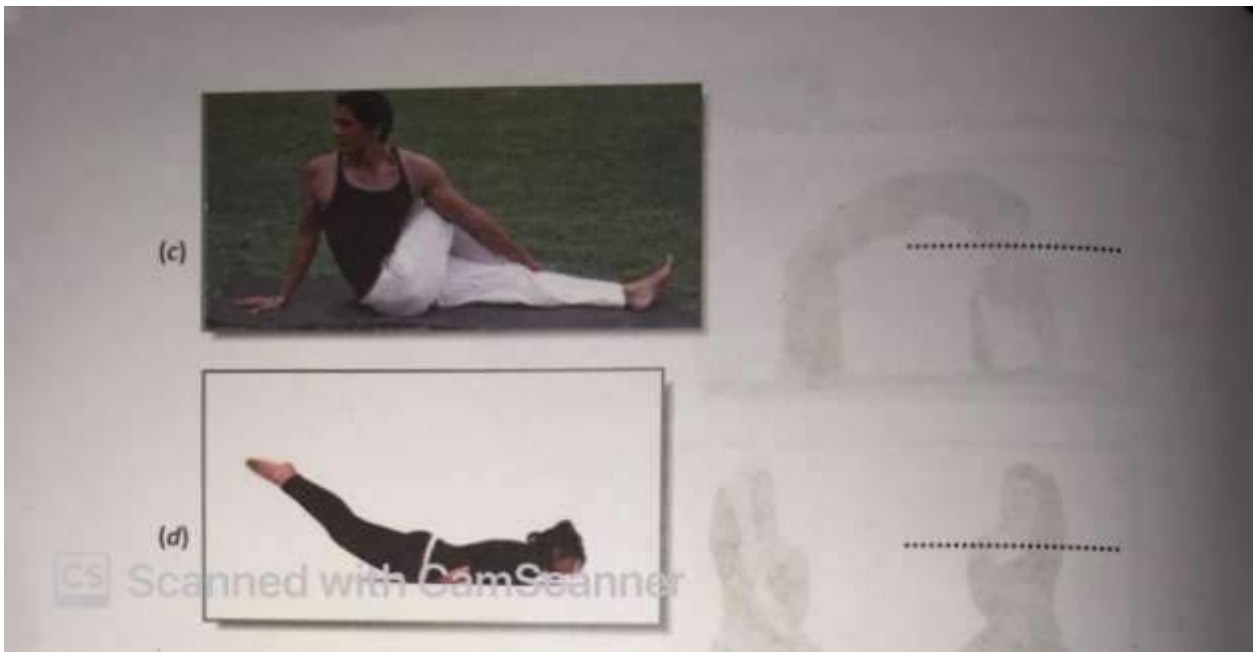

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MUSIC

Holidays home work
Class 12th
Subject:Music(Hindustani)vocal

1.Project on "The History of Indian Music"
(make ppt)
Or
Knowledge of the structure and tuning of **"Tanpura"**
2.make video on Raag Bhairav and its history
3.chart on :
1.Biography on krishan rao pandit
2.Abdul karim khan
3.Taals:Roopak/Jhaptaal(full detail)
4.As a music student ,what steps would you like to take to aware the society about the importance of indian classical music.

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BIOLOGY

UNIT 1

Chapter-1: Reproduction in Organisms

1. What is a meiocyte? **1**
2. Give the term for period of growth before an organism attain sexual maturity.**1**
3. Some organisms reproduce throughout the year. What are they called? **1**
4. A Papaya plant has a staminate flower. What does it mean? **1**
5. By which event pollen grains reach up to the stigma of a flower. **1**
6. Where does syngamy occur in amphibians and reptiles? **1**
7. Differentiate between antherozoid and egg cell. **2**
8. Homothallic and heterothallic conditions are referred for? **2**
9. How is zygote different from zoospore? **2**
10. Birds are oviparous and humans are viviparous. What does it mean? **2**
11. In which structure zygote, ovule and ovary developed during post-fertilization changes? **3**
12. Define embryogenesis. Explain its events in brief. **3**
13. Name the vegetative propagules in the following. i) Banana ii) Agave iii) Bryophyllum iv) Water Hyacinth
14. Differentiate between the following . a. Oviparous and viviparous b. Pre-fertilization and post-fertilization events
15. How is the sexuality of a papaya plant different from a maize plant?
16. In which organisms gametes are non motile? How do they reach the female gamete for fertilization?
17. Give reasons :

A. Rotifers are called Parthenocarpic organisms

B. Mammals living in natural wild condition are seasonal breeders

C. Water Hyacinth is called an invasive weed

D. Bamboo plants are considered to have an unusual flowering response .

E. Marchantia is considered dioecious .

18. Define external fertilization. Mention its disadvantages.

19. What are hermaphrodites?

20. Describe gametogenesis with suitable examples.

21. What do you mean by monoecious and dioecious organisms?

22. Diagrammatically depict asexual reproduction /vegetative propagation in – Amoeba b) Chlamydomonas c)Bryophyllum

23. Describe the terms: Ovipary, Vivipary and Ovo-vivipary

24. State the post fertilization changes in flower

Chapter-2: Sexual Reproduction in Flowering Plants

25. What is agamospermy? 1

26. Can snails pollinate the flowers? What do you call such a pollination?

27. In some species of Asteraceae and grasses seeds are formed without fusion of gametes. Give the scientific term for such type of reproduction.

28. How are pollen stored in a pollen bank? 1

29. Hypanthodium is a special type of inflorescence. Then what is hypanthium? 1

30. In the embryos of a typical dicot and a grass, which are the true homologous structures?

31. State two differences between Perisperm and Pericarp

32. Draw l.s of anatropous ovule of an angiosperm and label a) Nucellus b) Secondary nucleus.

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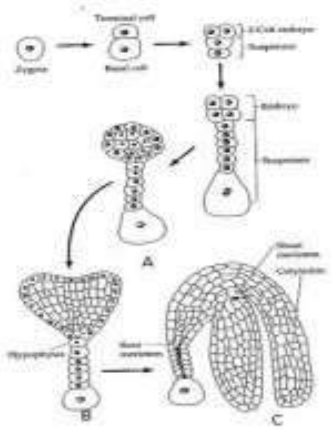
33. Identify the type of placentations and define them

34. Draw a labeled sectional view of albuminous seed and Give two advantages of seeds to flowering plants

35. Continued self pollination leads to inbreeding depression. List three devices, which flowering plant have developed to discourage self pollination?



i. The diagram represents the stages of dicot embryo development. Label A, B and C.

ii. Which type of cell division takes place in embryogenesis?

iii. Endosperm development precedes embryo development.Justify.

36. Why are pollen grains produced in enormous quantities in maize?

37. What is the ploidy of the cells in the microspore tetrad?

38. What is the ploidy of PEN?. How many eggs are present in an embryo sac?

39. Even though each pollen grain has two male gametes, why are at least 10 pollen grains and not pollen grains required to fertilize 10 ovules present in a particular carpel?

40. What are parthenocarpic fruits?
41. What is scutellum?
42. What is a pollen bank?
43. Identify the given figure and label the parts.
44. Of the eight nuclei of the embryo sac in flowering plants, three are at the micropylar end.
45. How many are there at the chalazal end and how many nuclei are located in the central cell?
46. How could pollen grains be well preserved as fossils?
47. What are the effects of pollen in some people and how are the pollen grains being used as food supplements?
48. How many haploid nuclei and haploid cells are present in the female gametophyte of angiosperm?
49. Why is the process of fertilization in flowering plants referred to as double fertilization? Explain.

Chapter-3: Human Reproduction

50. Name the cells which secrete androgens
51. What does the head of a sperm consist of?
52. Name the structure which secretes progesterone.
53. Name the structures which secrete estrogen.
54. Name the site of fertilization in human beings.
55. What is the main function of Sertoli cells?
56. Name the outermost layer of the blastocyst
57. What promotes the completion of the second meiotic division in oogenesis?
58. Testes normally remain suspended in scrotum in mammals. Why?

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59. How many spermatozoa will be produced from 100 primary spermatocytes and how many ova are produced from 100 primary oocytes
60. Name the three layers of the embryo that give rise to all tissues and also name the cells which have the potency to give rise to all the tissues and organs.
61. What is oogenesis? Where does it occur?
62. What is ovulation? What happens to Graafian follicle after ovulation?
63. What is colostrum? What is its importance?
64. Draw a labeled diagram of the following and label six parts
65. i) T.S. of a testis ii) T.S. of an ovary iii) Sperm iv) Ovum. v) Embryo development vi) Female reproductive system
66. Mention any three differences between spermatogenesis and oogenesis.
67. Differentiate between Leydig cells and Sertoli cells with reference to their location in the organ and their function.
68. What is parturition? How is it induced? Which hormones are involved in the induction of parturition?
69. What is a seminiferous tubule? Name the various types of cells present in it and explain its function.
70. Explain different phases of spermatogenesis with schematic representation.
71. Explain different phases of oogenesis with a schematic representation
72. Name the glands associated with male reproductive organs and state their functions.
73. Explain the various phases of menstrual cycle with reference to changes in ovary and uterus and hormonal cycle.
74. Explain the process of fertilization.

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Chapter-4: Reproductive Health

75. Name the drug developed by CDRI, Lucknow. 1

76. Increasing female foeticide is the result of amniocentesis. How? 1

77. Cutting and tying of vas deferens is termed as ----------. 1

78. How many cell stage embryos will transfer in ZIFT? 1

79. Lactational amenorrhea is a contraceptive method. How? 1

80. Give two examples of copper releasing IUDs. 1

81. Write type of surgical methods of contraception. 2

82. Oral contraceptives are considered safer than other methods.Justify 2

83. Write the full form of ART. List any two techniques. 2

84. When does GIFT and ZIFT apply? 2

85. What are the objectives of sex education in schools? 3

86. Write the aims and objectives of RCH programmes. 3

87. Define reproduction

88. Name the technique to know the genetic disorders in the foetus.

89. What is MTP?

90. List one drawback of surgical methods of birth control.

91. Which period of pregnancy is safer for MTP?

92. What are the measures one has to take to prevent contracting STDs?

93. Explain the technique amniocentesis .How is this technique misused?

94. Describe the three different practices under natural methods of birth control.

95. What are barrier methods of birth control? Explain.

96. Expand IUDs. Explain the various methods of IUDs.

97. What is sterilization? Explain the various methods.

98. How do oral contraceptives function? What is the advantage of Saheli?

99. What is an ideal contraceptive for women and explain its contraceptive role?

100. How Do The Natural, barriers, IUD's, Oralpills and Surgicalmethodshelpin Contraception?

101. What is STD?Lis tout the various STD's.How is it transmitted?What are its symptoms?What are the complications the STD could lead to?

102. Explain the various methods of Assisted Reproductive Technologies.

103. ExpandRCH,CDRI,MMR,IMR,AIDS,VD,RTI,IUT,IUI,AI,IVF,STD,MTP,IUD,ZIFT,GIFT,ART,ICSI .

104. Mrs. X was blamed for being childless though the problem was due to low sperm counts in the ejaculates of her husband. Suggest a technique which could help the couple to have a child.

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COMPETENCY BASED MODEL

BIOLOGY - UNIT 1

I. *During a visit to Tirupati, Sapna came across a young couple staying in the adjacent room in the hotel. She learnt that the couple had been visiting different temples and performing rituals to get a child. Sapna was astonished and explained to them about ART which she had recently studied in Biology. The couple were happy and understood their wrong approach and thanked Sapna.*

A. Identity the values which Sapna has shown

B. What is ART? What are the various methods included in ART?

C. What are the limitations for which ART is not commonly accepted?

II. *Some parents wrote a complaint letter to the local municipality to remove all hoardings in the city advertising the use of condoms and matters relating to AIDS prevention. The children of these parents came to know about the matter and raised their voice against removal of those hoardings. The parents were convinced by the awareness level of their children and withdrew the complaint.*

A. Parents considered the hoarding as sight pollution. Why do you disagree?

B. What value is promoted by the children protesting against their parents?

C. Ok I got to c) What are the methods by which AIDS spreads?

D. Read the following and answer any four questions:

III. *The gynoecium represents the female reproductive part of the flower. The gynoecium may consist of a single or more than one pistil. They may be fused or maybe free. The placenta is located inside the ovarian cavity. Megasporangium (ovule) consists of a small structure attached to the placenta by a stalk called a*

funicle. The body of the ovules fuses with a funicle in the region called hilum. The nucleus is located in the embryo sac. The process of formation of megaspore from the megaspore mother cell is called megasporangium. Meiosis results in the formation of four megaspore

A. *Gynoecium with a single pistil is known as:*

1. multicarpellary
2. monocarpellary
3. syncarpous
4. apocarpous

B. Which of the following is not part of the ovary?

1. Stigma
2. Style
3. Ovary
4. Stamen

C. The protective involve of the ovule is called:

1. Integument
2. Micropyle
3. Chalaza
4. Helium

D. Which of the following have only one ovule in the ovary?

1. Papaya
2. Watermelon
3. Mango
4. Orchids

IV. *Humans are sexually reproducing and viviparous; it involves male and female reproductive systems. The male reproductive system is located in the pelvis region. It includes a pair of testis along with accessory ducts, glands and the external genitalia. The testes are situated outside the abdominal cavity within a pouch called the scrotum. The testis is covered by a dense covering. Each testis has about 250 compartments. Each lobule contains one to three highly coiled seminiferous tubules in which sperms are produced. Each seminiferous tubule is lined on its inside by two types of cells. The regions outside the seminiferous tubules called interstitial spaces contain small blood vessels. Seminiferous tubules of the testis open into the vasa efferentia through rete testis. The vasa efferentia leave the testis and open into epididymis located along the posterior surface of each testis.*

A. The vas deferens receives duct from the seminal vesicle and opens into the urethra as

1. epididymis
2. ejaculatory duct
3. efferent ductule
4. Ureter

B. Which one of the following is not a male accessory gland?

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1. Seminal vesicle

2. Ampulla

3. Prostate

4. Bulbourethral gland

C. The temperature of the scrotum which is necessary for the functioning of the testis is always around below body temperature.

1. 2-2.5°C

2. 4-5°C

3. 6-6.5°C

4. 7-8°C

D. The nutritive cells found in seminiferous tubules are

1. Leydig's cells

2. Male germ cells

3. Sertoli cells

4. Chromaffin cells.

E. Identify (a) and (b) in the given image.

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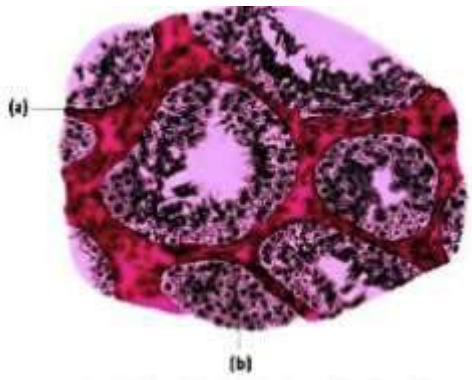

1. a - Sertoli cell, b- interstitial cell

2. a - interstitial cell, b - spermatogonia

3. a - spermatozoa, b - Sertoli cell

4. a - spermatozoa, b - spermatogonia

V. *After implantation, finger-like projections appear on the trophoblast and chorionic villi which are surrounded by the uterine tissue and maternal blood. The chorionic villi and uterine tissue become integrated with each other and jointly form a structural and functional unit between the developing embryo (foetus) and maternal body. Placenta also acts as an endocrine tissue and produces several hormones. At pregnancy, the levels of other hormones like estrogens, progestogens, cortisol, prolactin are increased several fold in the maternal blood. Increased production of these hormones is essential for supporting the fetal growth, metabolic changes in the mother. The average duration of human pregnancy is about 9 months which is called the gestation period. Parturition is the delivery of the foetus. Parturition is induced by a complex neuroendocrine mechanism.*

A. Which of the following hormones is not secreted by the human placenta?

1. hCG

2. Estrogens

3. Progesterone

4. LH il.

B. The placenta facilitate

1. the supply of oxygen

2. supply of nutrients to the embryo

3. removal of carbon dioxide and excretory/waste materials produced by the embryo

4. all of these

C. The signals for parturition originate from

1. fully developed fetus

2. the placenta

3. both (i) and (ii)

4. none of these iv.

D. In human adult females oxytocin

1. stimulates the pituitary to secrete vasopressin

2. causes strong uterine contractions during parturition

3. is secreted by the anterior pituitary

4. stimulates the growth of mammary glands

E. Identify (a) in the given figure.

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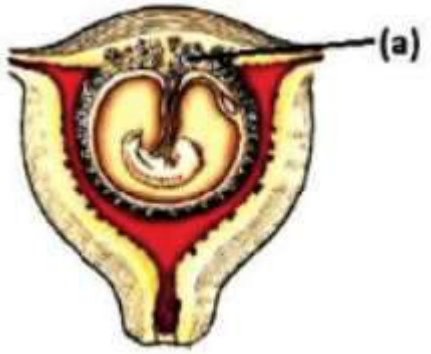

1. Placenta villi
2. Yolk sac
3. Cavity of center
4. Embryo

VI. *The reproductive cycle in female primates is called the menstrual cycle. One ovum is released during the middle of each menstrual cycle. The cycle starts with the menstrual phase when menstrual flow occurs and it lasts for 3-5 days. The menstrual flow results due to the breakdown of the endometrial lining of the uterus and its blood vessels which form a liquid that comes out through the vagira. The menstrual phase is followed by the follicular phase, the primary follicles in the ovary grow to become a fully mature Graafian follicle. Both LH and FSH attain a peak level in the middle of the cycle. The ovulatory phase is followed by the luteal phase during which the remaining parts of the Graafian follicle transform. During pregnancy, all events of the menstrual cycle stop and there is no menstruation.*

A. At what stage of life is oogenesis initiated in a human female?

1. At puberty
2. During menarche

3. During menopause

4. During embryonic development

B. Ovulation in the human female normally takes place during the menstrual cycle

1. at the mind secretory phase

2. just before the end of the secretory phase

3. at the beginning of the proliferative phase

4. at the end of the proliferative phase

C. Immediately after ovulation, the mammalian egg is covered by a membrane known as

1. chorion

2. zona pellucida

3. corona radiata

4. vitelline membrane

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