POLICE D.A.V. PUBLIC SCHOOL, LUDHIANA

HOLIDAYS' HOMEWORK

CLASS XII

ENGLISH

*As the Secretary of the Social welfare club,Greenfield convent school,Mumbai, draft a formal invitation inviting parents to an art fair where the culture and tradition of Odhisha are going to be highlighted

*The Social Welfare Club has organised an art fair,where the culture and tradition of Odisha is going to be highlighted.Draft an invitation inviting the famous classical dancer Bhavna Manchanda,to be the guest of honour.Write the invitation for the same

*Read the chapter The Enemy and prepare five competency based questions

Questions can be in the form of MCQ's,short answer questions or long answer questions

CHEMISTRY

1. Prepare the project file on the given topic

FORMAT FOR PREPARING PROJECT REPORT ARRANGING THE CONTENTS:

- The sequence in which the project report material should be arranged and bound should be as follows:
- Cover Page & Title Page
- Certificate from the project supervisor, counter signed by the HOD / Division or Group Head
- Table of Contents
- Declaration
- Introduction, Material required, Procedure , Observation and Conclusion
- References

S.NO.	CLASS(ROLL NO.)	TOPIC
1.	XII MEDICAL (1,8,15,22) XII NON-MEDICAL(5,12,19,26)	To study the presence of oxalate ions in guava fruits at different stages of ripening
2.	XII MEDICAL (2,9,16,23) XII NON-MEDICAL (6,13,20,27)	Study the quantity of casein present in the milk
3.	XII MEDICAL (3,10,17,24) XII NON-MEDICAL (7,14,21,28)	Preparation of soyabean milk and its comparison to with the natural milk witn repect to curd formation , effect of temperature
4.	XII MEDICAL (4,11,18) XII NON-MEDICAL (1,8,15,22)	Study the effect of potassium bisulphite as food preservative under various conditions (temperature, concentration , time)
5.	XII MEDICAL (5,12,19) XII NON -MEDICAL (2,9,16,23)	Study the common food adulterants in fat, oil butter, sugar ,turmeric powder, chilli powder and pepper.
6.	XII MEDICAL (6,13,20) XII NON-MEDICAL(3,10,17,24)	Comparative study of rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice.
7.	XII MEDICAL (7,14,21) XII NON-MEDICAL (4,11,18,25)	Study the digestion of starch by salivary amylase and effect of pH and temperature on it.

2. Read the chapters Solution and Electrochemistry
3. Worksheets of concerned chapters will be shared in the group and they must be solved along with the notes.
4. Practicals should be completed till 5th July in the format as the pdf shared. Only right hand side of the file should be prepared.
5. Prepare the class presentation on the allotted topic

S.NO.	CLASS (ROLL NO.)	Solution	Electrochemistry
1.	XII MEDICAL (1,8,15,22)	Vapour pressure of	Electrolytic conductance, metallic

	XII NON-MEDICAL(5,12,19,26)	liquid solution , ideal and non ideal solution	conductance and factors affecting it
2.	XII MEDICAL (2,9,16,23) XII NON-MEDICAL (6,13,20,27)	Colligative properties : relative lowering in vapour pressure	Molar conductivity and equivalent conductivity and realtion between them
3.	XII MEDICAL (3,10,17,24) XII NON-MEDICAL (7,14,21,28)	Elevation in boiling point and depression in freezing point	Effect of dilution on conductivity, molar conductivity of strong and weak electrolytes
4.	XII MEDICAL (4,11,18) XII NON-MEDICAL (1,8,15,22)	Osmosis and osmotic pressure	Galvanic cell, electrode potentials, calculate of standard electrode potential using SHE and standard emf of cell
5.	XII MEDICAL (5,12,19) XII NON -MEDICAL (2,9,16,23)	Abnormal molar mass: Van't Hoff factor	Calculation of emf of cell using Nernst Equation, Gibbs Energy and equilibrium constant
6.	XII MEDICAL (6,13,20) XII NON-MEDICAL(3,10,17,24)	Concentration terms with special reference to Normality and Formality	Laws of electrolysis and its numericals and batteries
7.	XII MEDICAL (7,14,21) XII NON-MEDICAL (4,11,18,25)	Solubilty and factors affecting the solubility	Product of electrolysis and corrosion

BIOLOGY

1. Read the chapters human health and diseases, biodiversity and it's conservation, microbes in human welfare.
2. Make notes of all these chapters and they must be shown on 5th July, 2024.
3. Worksheets of concerned chapters will be shared in the group and they must be solved along with the notes.
4. Project work will be assigned for final evaluation in Practical. It must be made in the same format as the pdf shared in the group. Every student will be assigned a different project.
5. Practical file should be completed till 5th July in the format as the pdf shared. Readings should not be written. Only tables and diagrams along with the experiment should be made.

PHYSICS

1.ELECTRIC CHARGES AND FIELDS

(i) Multiple Choice Questions

1. Two charges 3×10^{-5}C and 5×10^{4} C are placed at a distance 10 cm from each other. Find the value of electrostatic force acting between them.

   (a) 13.5×10^{11}N (b) 40×10^{11}N

   (c) 180×10^{9} N (d) 13.5×10^{10} N
2. What is the S. I. unit of electric flux?

   (a) N $C^{-1}m^2$ (b) N m^2

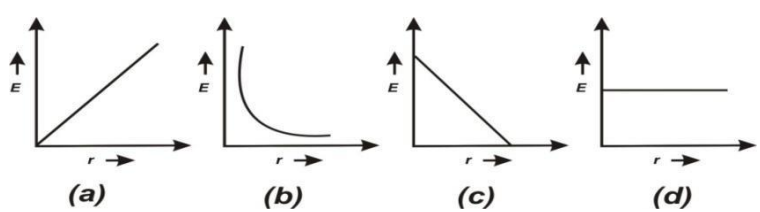
   (c) N m^{-1} C (d) N^2 $m^{-2}m^2$ C
3. If $\int E.ds = 0$ inside a surface, that means

   (a) there is no net charge present inside the surface

   (b) Uniform electric field inside the surface

   (c) Discontinues field lines inside the surface

   (d) Charge present inside the surface
4. For a point charge, the graph between electric field versus distance is given by : -



5. What will be the value of electric field at the centre of the electric dipole : -
   (a) Zero
   (b) Equal to the electric field due to one charge at centre
   (c) Twice the electric field due to one charge at centre
   (d) half the value of electric field due to one charge at centre
6. The value of electric field inside a conducting sphere having radius R and charge Q will be :
   (a) $\frac{kQ}{r^2}$ (b) $\frac{kQ}{r}$
   (c) Zero (d) $\frac{kQ^2}{r^2}$
7. Which physical quantity have unit Newton /coulomb.
   (a) Electric charge (b) Electric field
   (c) Electric force (d) Electric potential
8. Four charges + 8Q, - 3Q +5Q and -10Q are kept inside a closed surface. What will be the outgoing flux through the surface.
   (a) 26 V-m (b) 0 V-m
   (c) 10 V-m (d) 8 V-m
9. Charge Q is kept in a sphere of 5 cm first than it is kept in a cube of side 5 cm. the outgoing flux will be-
   (a) More in case of sphere (b) More in case of cube
   (c) Same in both case (d) Information Incomplete

Electric field intensity due to a short dipole remains directly proportional to - (r → distance of a point from centre of dipole)

   (a) r^2 (b) r^3
   (c) r^{-2} (d) r^{-1}

10. Electric field lines contracts lengthwise, It shows
    (a) repulsion between same charges
    (b) Attraction between apposite charges
    (c) No relation between force & contraction.
    (d) Electric field lines does not moves on straight path.

(ii) Completion Type Questions

1. A charge Q is enclosed by a Gaussian spherical surface of radius R. If the radius is doubled, then the electric……will remain same.
2. An electric dipole is placed inside uniform electric field. When it is rotated from unstable equilibrium to stable equilibrium in a uniform electric field, its potential energy……
3. S. I. Unit of electric field is……
4. Direction of electric field intensity due to a dipole on equatorial point is…….to the direction of dipole moment.

(iii) True/False Type Questions

1. The electric force between two charges changes, if we bring a third charge closer to them.
2. Electric field on the axis of a short dipole at a distance r from the dipole is given by $\frac{k\,p^2}{r^2}$
3. Electric field intensity due to an Infinite charge sheet decreases by increasing distance.
4. It is possible that two similarly charged bodies can attract each other
5. Charge given to a spherical conductor is uniformly distributed in its entire volume.

6. Gauss law is valid only for the fields which follows inverse square law.

7. The minimum field required to produce breakdown of air is 3 x 10^6 V/m. Therefore a conducting sphere 10 cm in radius can easily hold a charge of 4 x 10^{-6} C in air without breakdown.
8. Three equal charges ('Q' each) are placed at the corners of an equilateral triangle of side 'a'. The force on any one of the charge is $\frac{Q^2\sqrt{3}}{4\pi\varepsilon_0 a^2}$

(iv) Matching type Questions

1. (i) Direction of dipole moment
   (ii) Direction of electric field lines

   (a) positive charge to negative charge
   (b) negative charge to positive Charge
   (c) Positive charge to positive charge.

2. (i) Electric field intensity on the surface of charged conducting sphere — (a) $\frac{\sigma}{\varepsilon_0}$

   (ii) Electric field intensity due to infinite charged sheet — (b) $\frac{\sigma}{2\varepsilon_0}$

   (c) $\frac{\sigma}{4\varepsilon_0}$

   (d) $\frac{\sigma}{6\varepsilon_0}$

ELECTROSTATIC POTENTIAL AND CAPACITANCE

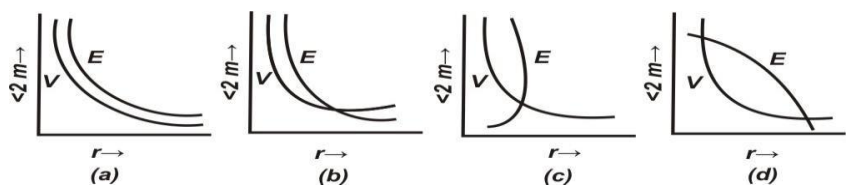
(i) Multiple Choice Questions

1. When charge is supplied to a conductor, its potential depends upon
   (a) the amount of charge
   (b) Geometry & size of conductor
   (c) both (a) & (b)
   (d) only on (a)

2. A parallel plate capacitor is charged by a battery. Once it is charged battery is removed. Now a dielectric material is inserted between the plates of the capacitor, which of the following does not change?
   (a) electric field between the plates
   (b) potential difference across the plates
   (c) charge on the plates
   (d) energy stored in the capacitor.

3. A dipole is placed parallel to electric field. If W is the work done in rotating the dipole from 0° to 60°, then work done in rotating it from 0° to 180° is
   (a) 2 W
   (b) 3 W
   (c) 4 W
   (d) W/2

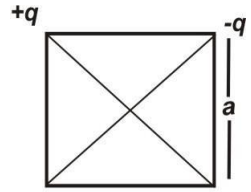
4. The variation potential V with r & electric field with r for a point charge is correctly shown in the graphs.



5. Three capacitors of capacitances 1μF, 2μF & 3μF are connected in series and a potential difference of 11V is applied across the combination them the potential difference across the plates of 1μF capacitor is

(a) 2V (b) 4V (c) 1V (d) 6V

6. The potential at the centre of the square is-



(a) Zero (b) $\frac{kq}{a\sqrt{2}}$ (c) $\frac{kq}{a^2}$ (d) $\frac{kq}{2a^2}$

7. Two conducting spheres A and B of radii a & b respectively are at the The ratio of surface charge densities of A and B is

(a) $\frac{b}{a}$ (b) $\frac{a}{b}$ (c) $\frac{a^2}{b^2}$ (d) $\frac{b^2}{a^2}$

8. Work done to bring a unit positive charge un-accelerated from infinity to a point inside electric field is called :

(a) Electric field (b)Electric potential

(c) Capacitance (d) Electric flux

9. Electric field is always :
(a) Parallel to equipotential surface
(b) Perpendicular to equipotential surface
(c) It can be perpendicular and parallel as well
(d) It does not depends on distribution of charge

10. Electric field and electric potential inside a charged spherical shell :

(a) E = 0; V = 0 b) E = 0 ; V ≠ 0

(c) E ≠ 0 ; V = 0 (d) E ≠ 0 ; V ≠ 0

11. On reducing potential across or capacitor, its capacitance of an object :

(a) Decreases (b) Increases

(c) Remains constant (d) First increases then decreases

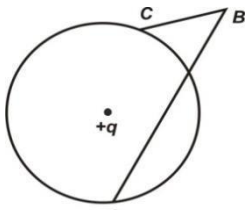
(ii) Completion Type Questions

1. The potential energy of a charge q when placed in a potential V(r) is ……
2. It is safer to be inside the car rather than standing outside under a trace during lightening is based on……concept.
3. A capacitor is charged and is not connected to a battery; Potential between plates of the capacitor .....when it is filled with dielectric.0

(iii) True/False Type Questions

1. A conducting hollow sphere of radius 10 cm has an electric potential on the surface be 10V. Then the electric potential at the centre of the hollow sphere will be zero.
2. The work done in rotating the electric dipole in uniform electric field from $\theta = 0^0$ to $\theta = 60^0$ will be negative.
3. Electric field inside the dielectric material is always less because induced electric field is set up within it, which is in a direction opposite to original electric field.

4. Charge q is placed at the center of an imaginary sphere as shown following. Work done in moving a charge from A to B is greater than taking the charge from B to C.



5. We can place a metal sphere of capacitance 1Farad inside an almirah.
6. Work done to displace any electric charge from one point to another point on equipotential surface is always zero.
7. Electric field intensity outside parallel plate capacitor is zero.

(iv) Matching type Questions

1. (a) Electric field due to a single charge — (P) $\boldsymbol{E \alpha \frac{1}{r}}$

   (b) Electric field due to an electric dipole — (Q) $\boldsymbol{E \alpha \frac{1}{r^2}}$

   (R) $\boldsymbol{E \alpha \frac{1}{r^3}}$

2. (a) SI unit of potential difference — (P) N m^2 C^{-1}
   (b) SI unit of Electric field — (Q) N m C^{-1}
   (R) kg m s^{-2} C^{-1}

3. Practical work : Practical work of physics to write in your notebook will be sent in group on 1st june 2024.

24. If $x + y + z = \pi$, then the value of

$$\Delta = \begin{vmatrix} \sin(x+y+z) & \sin B & \cos C \\ -\sin B & 0 & \tan A \\ \cos(A+B) & -\tan A & 0 \end{vmatrix}$$ is equal to:

A. 0 B. $2\sin B \tan A \cos C$

C. 1 D. None of these

25. The value of determinant

$$\begin{vmatrix} x+1 & x+2 & x+4 \\ x+3 & x+5 & x+8 \\ x+7 & x+10 & x+14 \end{vmatrix}$$ is

A. -2 B. $x^2 + 2$

C. 2 D. None of these

26. If one root of the equation $\begin{vmatrix} 7 & 6 & x \\ 2 & x & 2 \\ x & 3 & 7 \end{vmatrix} = 7$ is $x = -9$, then the other roots are

A. 2, 6 B. 3, 6

C. 2, 7 D. 3, 7

27. If ω is a cube root of unity, then a root of the equation $\begin{vmatrix} x+1 & \omega & \omega^2 \\ \omega & x+\omega^2 & 1 \\ \omega^2 & 1 & x+\omega \end{vmatrix} = 0$ is

A. $x = 1$ B. $x = \omega$

C. $x = \omega^2$ D. $x = 0$

28. If (x) is a polynomial satisfying

$$f(x) = \frac{1}{2}\begin{vmatrix} f(x) & f(1/x) - f(x) \\ 1 & f(1/x) \end{vmatrix}$$

and $f'(2) = 17$, then the value of $f(5)$ is

A. 624 B. -124

C. 626 D. 126

29. If the value of a third order determinant is 11, then the value of the square of the determinant formed by the cofactors will be

A. 11 B. 121

C. 1331 D. 14641

30. Let $\Delta = \begin{vmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{vmatrix}$

The Δ lies in the interval

A. [3, 4] B. [2, 4]

C. [1, 4] D. None of these

31. $\begin{vmatrix} 1 & 1 & 1 \\ {}^{m}C_1 & {}^{m+2}C_1 & {}^{m+2}C_1 \\ {}^{m}C_2 & {}^{m+1}C_2 & {}^{m+2}C_2 \end{vmatrix}$ is equal to

A. $m(m+1)$ B. 0

C. 1 D. $m(m-1)$

32. If a, b, c are different and

$$\begin{vmatrix} a & a^2 & a^3 - 1 \\ b & b^2 & b^3 - 1 \\ c & c^2 & c^3 - 1 \end{vmatrix} = 0$$, then

A. $a + b + c = 0$ B. $abc = 1$

C. $a + b + c = 1$ D. $ab + bc + ca = 0$

33. If $\Delta_1 = \begin{vmatrix} x & b & b \\ a & x & b \\ a & a & x \end{vmatrix}$ and $\Delta_2 = \begin{vmatrix} x & b \\ a & x \end{vmatrix}$ are the given determinants, then

A. $\Delta_1 = 3(\Delta_2)^2$ B. $(d/dx)\Delta_1 = 3\Delta_2$

C. $(d/dx)\Delta_1 = 3\Delta_2^2$ D. $\Delta_1 = 3(\Delta_2)^{3/2}$

34. The determinant

$$\begin{vmatrix} \cos(\theta+\phi) & -\sin(\theta+\phi) & \cos 2\phi \\ \sin\theta & \cos\theta & \sin\theta \\ -\cos\theta & \sin\theta & \cos\theta \end{vmatrix}$$ is

A. 0

B. independent of θ

C. independent of ϕ

D. independent of both θ and ϕ

35. For the system of equations $a_1x + b_1y + c_1z = 0$, $a_2x + b_2y + c_2z = 0$, $a_3x + b_3y + c_3z = 0$,

if $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = 0$, then the system has

A. more than two solutions

B. one trivial and one non-trivial solution

C. no solution

D. only trivial solution (0, 0, 0).

36. If the system of linear equations $x + 4ay + az = 0$, $x + 3by + bz = 0$, $x + 2cy + cz = 0$, have a non-zero solution, then a, b, c are in

A. A.P. B. G.P.

C. H.P. D. None of these

37. The value of λ for which the system of equations $2x - y + 3 = 0$; $x + \lambda y + 7 = 0$; $3x + 2y - 2 = 0$ is consistent, is given by

A. -3 B. -9

C. $-45/13$ D. $45/13$

38. If A_1, B_1, C_1 ..... are respectively the cofactors of the elements a_1, b_1, c_1 .... of the determinant

$$\Delta = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_1 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}, \text{ then } \begin{vmatrix} B_2 & C_2 \\ B_3 & C_3 \end{vmatrix} =$$

A. $a_1 \Delta$

B. $a_1 a_3 \Delta$.

C. $(a_1 + b_1)\Delta$

D. None of these

39. If $\begin{vmatrix} x & x+y & x+y+z \\ 2x & 3x+2y & 4x+3y+2z \\ 3x & 6x+3y & 10x+6y+3z \end{vmatrix} = 64$,

then the real value of x is

A. 2

B. 3

C. 4

D. 6

40. If $\Delta_r = \begin{vmatrix} x & y & z \\ 2^r & 2\times 3^r & 3\times 4^r \\ 2\times(2^n-1) & 3\times(3^n-1) & 4\times(4^n-1) \end{vmatrix}$

then $\sum_{r=1}^{n} \Delta_r$ is equal to

A. 0

B. xyz

C. $24xyz\,(2^n - 1)\,(3^n - 1)\,(4^n - 1)$

D. None of these

41. The parameter, on which the value of the determinant

$$\begin{vmatrix} 1 & a & a^2 \\ \cos(p-d)x & \cos px & \cos(p+d)x \\ \sin(p-d)x & \sin px & \sin(p+d)x \end{vmatrix}$$

does not depend upon, is

A. a B. p

C. d D. x

42. The determinant

A. x, y, z are in A.P.

B. x, y, z are in G.P.

C. x, y, z are in H.P.

D. xy, yz, zx are in A.P.

43. Let $f(x) = \begin{vmatrix} x^3 & \sin x & \cos x \\ 6 & -1 & 0 \\ p & p^2 & p^3 \end{vmatrix}$ where p is constant. Then $\frac{d^3}{dx^3} f(x)$, at $x = 0$ is

A. p B. $p + p^2$

C. $p + p^3$ D. independent of p

10. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$, then $A^2 - 5A + 6I =$

A. $\begin{bmatrix} 1 & -1 & -5 \\ -1 & -1 & 4 \\ -3 & -10 & 4 \end{bmatrix}$ B. $\begin{bmatrix} 1 & -1 & -3 \\ -1 & -1 & -10 \\ -5 & 4 & 4 \end{bmatrix}$

C. O D. I

11. If $A = \begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix}$, then $(A - 2I)(A - 3I) =$

A. A B. I

C. O D. 5I

12. Let $A = \begin{bmatrix} 1 & 2 \\ 3 & -5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$ and X be a matrix such that $A = BX$. Then $X =$

A. $\begin{bmatrix} 2 & 4 \\ 3 & -5 \end{bmatrix}$ B. $\frac{1}{2}\begin{bmatrix} 2 & 4 \\ 3 & -5 \end{bmatrix}$

C. $\frac{1}{2}\begin{bmatrix} -2 & 4 \\ 3 & 5 \end{bmatrix}$ D. None of these

13. If $A = \begin{bmatrix} 5 & x \\ y & 0 \end{bmatrix}$ and $A = A'$, then

A. $x = 0, y = 5$ B. $x + y = 5$

C. $x = y$ D. None of these

14. If $A = \begin{bmatrix} -1 & -2 & -2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$, then Adj A =

A. A B. A'

C. 3A D. $3A'$.

15. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$, then $A^{-1} =$

A. $\begin{bmatrix} -3 & 2 \\ 2 & -1 \end{bmatrix}$ B. $\begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ D. $\begin{bmatrix} 3 & -2 \\ -2 & 1 \end{bmatrix}$

16. If $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$, then $A^{-1} =$

A. A B. A^2

C. A^3 D. A^4

17. The equations:
$2x - 3y + 6z = 4$, $5x + 7y - 14z = 1$
$3x + 2y - 4z = 0$, have

A. unique solution

B. no solution

C. infinitely many solutions

D. None of these

18. If every element of a third order deteminant of value Δ is multiplied by 5, then the value of the new determinant is

A. Δ B. 5Δ

C. 25Δ D. 125Δ

19. The value of the determinant $\begin{vmatrix} -1 & 1 & 1 \\ 1 & -1 & 1 \\ 1 & 1 & -1 \end{vmatrix}$ is equal to

A. -4 B. 0

C. 1 D. 4

20. If $\begin{vmatrix} 4 & 1 \\ 2 & 1 \end{vmatrix}^2 = \begin{vmatrix} 3 & 2 \\ 1 & x \end{vmatrix} - \begin{vmatrix} x & 3 \\ -2 & 1 \end{vmatrix}$, then $x =$

A. 6 B. 7

C. 8 D. None of these

21. The value of determinant

$$\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$$ is

A. 0

B. 1

C. ∞

D. ω: where ω is a cube root of unity

22. If $\begin{vmatrix} x+a & b & c \\ c & x+b & a \\ a & b & x+c \end{vmatrix} = 0$, then one of the values of x is

A. $a + b + c$ B. $-(a + b + c)$

C. $a^2 + b^2 + c^2$ D. $a^3 + b^3 + c^3$

23. Cofactor of 4 in the determinant $\begin{vmatrix} 1 & 2 & -3 \\ 4 & 5 & 0 \\ 2 & 0 & 1 \end{vmatrix}$ is equal to

A. 2 B. -2

C. -5 D. None of these

Case II: [illegible] the remaining unknown in terms of two constants.

MULTIPLE CHOICE QUESTIONS

1. If $A = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ then A is

A. diagonal matrix B. scalar matrix
C. unit matrix D. None of these

2. If A is symmetric as well as skew-symmetric matrix, then A is

A. diagonal B. null
C. triangular D. None of these

3. Let $A = \begin{bmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{bmatrix}$. Then A^3 is

A. nilpotent B. idempotent
C. scalar D. None of these

4. If $A = \begin{bmatrix} 1 & 0 \\ 2 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 0 \\ 1 & 12 \end{bmatrix}$, then

A. $AB = O, BA = O$ B. $AB = O, BA \neq O$
C. $AB \neq O, BA = O$ D. $AB \neq O, BA \neq O$

5. If $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$, then

A. AB, BA exist and are equal
B. AB, BA exist and are not equal
C. AB exists and BA does not exists
D. AB does not exist and BA exists

6. If $A = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 0 & 0 \\ 1 & 0 & 1 \end{bmatrix}$, then $A^2 =$

A. A B. $-A$
C. $2A$ D. $-2A$.

7. If $A = \begin{bmatrix} 1 & 2 & 1 \\ 3 & 4 & 2 \\ 1 & 3 & 2 \end{bmatrix}$ and

$B = \begin{bmatrix} 10 & -4 & -1 \\ -11 & 5 & 0 \\ 9 & -5 & -1 \end{bmatrix}$, then

A. $AB = BA$ B. $AB \neq BA$
C. $AB = 2BA$ D. None of these

8. If $A = \begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}$, then $A^2 =$

A. $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ B. $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$
C. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ D. $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$

9. If the matrix AB is zero, then

A. $A = O$ or $B = O$
B. $A = O$ and $B = O$
C. It is not necessary that either $A = O$ or $B = O$
D. All these statements are wrong