



# SARALA BIRLA PUBLIC SCHOOL

Birla Knowledge City, Mahilong, Ranchi  
Session - 2021-22



## Assignment - 03

**Class: XII**

**Subject: ENGLISH**

1. You are Akhilesh of Tripura. You want a teacher of 'Kathak' for your younger sister. Write out an advertisement to be published in the classified columns of a local newspaper. (*Situation Vacant*)
2. You are Karan Kumar/ Karuna Bajaj, a leading lawyer practising in Surat. You want to buy an independent house at City Light Road. It is to be used as office-cum-residence. Draft an advertisement in about 50 words for the classified columns of a local newspaper. You can contact at 45645678. (*For Purchase*)
3. You are Sonal, the Secretary of the English Club of your school. You plan to organise an educational tour to Goa during the summer vacation. Prepare matters for the school notice board in about 50 words, mentioning the schedule of the tour, the expenses to be incurred, a permission letter from the parents and last date for giving names, etc.
4. You are Shilpa Mehta/Shivam Sharma, a member of NGO Sargam. Write a Letter to the Editor for a public campaign to clean the river in your city.
5. Standard Chartered Bank requires Officer Trainees to serve in its branches. The candidates should be the first-class graduates in any stream and should have participated in extracurricular activities. One year of work experience is desirable. Apply for this job stating your qualifications and experience. Write to The Head, Human Resources, Box No. L-198-D; 'The Hindu', Kolkata.

## CHEMISTRY

1. Define azeotropes . What type of azeotrope is formed by positive deviation from Raoult's law ? Give an example.
2. State the relationship amongst cell constant of a cell, resistance of the solution in the cell and conductivity of the solution. How is molar conductivity of a solution related to conductivity of its solution?
3. A voltaic cell is set up at 25<sup>0</sup>C with the following half cell; Al/Al<sup>3+</sup>(0.001 M) and Ni/Ni<sup>2+</sup>(0.50M)  
Calculate the cell voltage. [ $E_{\text{Ni}^{2+}/\text{Ni}}^0 = -0.25\text{V}$ ,  $E_{\text{Al}^{3+}/\text{Al}}^0 = -1.66\text{V}$ ]
4. State Faraday's laws of electrolysis. How much charge in terms of Faraday is required for reduction of 1mol of Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> to Cr<sup>3+</sup> ?

### 5. CASE-STUDY PASSAGE BASED

**Read the passage given below and frame five questions of M.C.Q type based on given passage.**

The osmotic pressure depends on the molar concentration of the solution. If two solutions are of equal solute concentration and, hence, have the same osmotic pressure, they are said to be isotonic. If two solutions are of unequal osmotic pressure, the more concentrated solution is said to be hypertonic and the more diluted solution is described as hypotonic. Osmosis is the major mechanism for transporting water upward in the plants.

## PHYSICS

1. Two heating elements of resistances R<sub>1</sub> and R<sub>2</sub> when operated at a constant supply of voltage V, consume powers P<sub>1</sub> and P<sub>2</sub> respectively. Deduce the expression for the powers of their combination when they are, in turn, connected in (i) series and (ii) parallel across the same voltage supply.
2. A circular coil of N turns and radius R carries a current I. It is unwound and rewound to make another coil of radius R/2, current I remaining the same,. Calculate the ratio of the magnetic moments of the new coil and the original coil.
3. How does the mutual inductance of a pair of coils change when

- (a) distance between the coils is increased and  
(b) number of turns in the coils is increased? Justify in each case.
4. (a) Use Gauss's law to derive the expression for the electric field (E) due to a straight uniformly charged infinite line of charge density  $\lambda$  C/m.  
(b) Draw a graph to show the variation of E with perpendicular distance r from the line of charge.  
(c) Find the work done in bringing a charge q from perpendicular distance  $r_1$  to  $r_2$  ( $r_2 > r_1$ )

**Case Study: Read the case given below and frame five MCQ questions related to it and also answer them.**

5. A charged particle moving in a magnetic field experiences a force that is proportional to the strength of the magnetic field, the component of the velocity that is perpendicular to the magnetic field and the charge of the particle.  
This force is given by  $\mathbf{F} = q(\mathbf{v} \times \mathbf{B})$  where q is the electric charge of the particle, v is the instantaneous velocity of the particle, and B is the magnetic field (in Tesla).  
The direction of force is determined by the rules of cross product of two vectors.  
Force is perpendicular to both velocity and magnetic field. Its direction is same as  $\mathbf{v} \times \mathbf{B}$  if q is positive and opposite to  $\mathbf{v} \times \mathbf{B}$  if q is negative.  
The force is always perpendicular to both the velocity of the particle and the magnetic field that created it. Because the magnetic force is always perpendicular to the motion, the magnetic field can do no work on an isolated charge. It can only do work indirectly, via the electric field generated by a changing magnetic field.

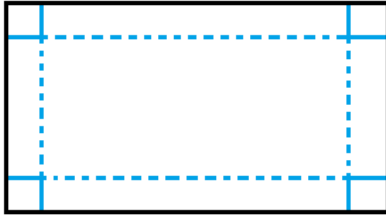
## **BIOLOGY**

1. Sickle cell anaemia in human is a result of point mutation? Explain.
2. Differentiate between Monohybrid and Dihybrid cross with suitable example.
3. Draw the labelled diagram of nucleosome.
4. Draw a coloured figure of the process of transcription in prokaryotes.
5. Read the following case and frame four multiple choice questions:

The anther is a four-sided structure consisting of four microsporangia located at the corner two in each lobe. The microsporangia develop further and become pollen sacs. In a transverse section, a typical microsporangium appears near circular in outline. It is generally surrounded by four wall layers- the epidermis, endothecium, middle layers and the tapetum.

## MATHS ( APPLIED )

1. A box open from the top, is to be constructed by removing equal squares from each corner of a rectangular sheet of aluminium of dimension breadth 3 m by length 8 m and folding up the sides as shown in the figure given below.



Based on the above information and figure, Answer the following given 5 MCQ'S questions.

- (i) If  $x$  m be the length of a side of the removed square, then the height of the box is:
- 3 m
  - $3x$  m
  - 8 m
  - $x$  m
- (ii) The length of the box is given by:
- $3 - 2x$
  - $8 - x$
  - $8 - 2x$
  - 8
- (iii) The breadth of the box is given by:
- $3 - 2x$
  - $3 - x$
  - $8 - 2x$
  - 3
- (iv) The volume of the box will be maximum, when the length of the removed square is:
- $\frac{3}{2}m$
  - $3m$
  - $2m$
  - $\frac{2}{3}m$
- (v) The maximum volume of the cuboidal box is given by:
- $\frac{100}{27}m^3$



c)  $\sqrt{100 - x^2} \text{ cm}$

d)  $x \text{ cm}$

ii) Let A be the area function of the trapezium with respect to the variable x, then the value of  $A(x)$  is given by

a)  $(x + 15)\sqrt{100 - x^2} \text{ cm}^2$

b)  $(x + 5)\sqrt{100 - x^2} \text{ cm}^2$

c)  $(x + 20)\sqrt{100 - x^2} \text{ cm}^2$

d)  $(x + 10)\sqrt{100 - x^2} \text{ cm}^2$

iii) The value of second derivative of the area function at  $x = 0$  i.e.  $A''(0)$  is given by

a) 0

b) 1

c) -1

d) 10

iv) The area of trapezium is maximum when

a)  $x = 10 \text{ cm}$

b)  $x = 2 \text{ cm}$

c)  $x = 15 \text{ cm}$

d)  $x = 5 \text{ cm}$

v) The area of trapezium, when it is maximum is given by

a)  $75\sqrt{3} \text{ cm}^2$

b)  $15\sqrt{3} \text{ cm}^2$

c)  $45\sqrt{3} \text{ cm}^2$

d)  $10\sqrt{3} \text{ cm}^2$

## CASE STUDY

2. A dealer deals in two item A and B. He has Rs 15,000 to invest and a space to store at the most 80 pieces. Item A cost him Rs 300 and item B costs him Rs 150. He can sell items A and B at the profits of Rs 40 and Rs 25 respectively. Assuming that he can sell all that he buys, formulate the above as a linear programming problem **AND** frame any five questions and hence solve it graphically .

3. Discuss the continuity of the function:  $f(x) = \begin{cases} \frac{\cos x}{\left(\frac{\pi}{2} - x\right)}, & x \neq \frac{\pi}{2} \\ 1 & , x = \frac{\pi}{2} \end{cases}$  at  $x = \frac{\pi}{2}$

4. Solve the linear equations by matrix method:  $\frac{1}{x} - \frac{1}{y} + \frac{1}{z} = 4$  ;  $\frac{2}{x} + \frac{1}{y} - \frac{3}{z} = 0$  ;  $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 2$

5. Show that the line  $\frac{x}{a} + \frac{y}{b} = 1$  touches the curve  $y = be^{-x/a}$  at the point where the curves crosses the axis of y.

## IP & CS

### MYSQL

Study and create the following tables DOCTOR and SALARY and write SQL commands for the following queries:

Table: DOCTOR

ID	NAME	DEPT	SEX	EXPERIENCE	DOJ	BIRTHPLACE
101	JOHN	ENT	M	12	01/10/2000	DELHI
104	SMITH	SKIN	M	10	14/08/2002	GURGAON
114	JOHNSON	MEDICINE	M	5	22/10/2007	SHILLONG
108	LUCY	ENT	F	7	20/08/2005	PATNA
115	MORPHY	MEDICINE	F	11	18/03/2002	GUWAHATI
110	MARIA	ENT	F	11	25/05/2001	DELHI
116	BILL	SKIN	M	8	30/06/2004	DELHI
105	LARA	ENT	F	3	13/05/2009	PATNA

Table: SALARY

ID	BASIC	ALLOWANCE	CONSULTATION
101	15000	1500	300
104	20000	2000	500
114	30000	3000	500
108	10000	1000	200
115	18000	1800	300
110	16000	1600	300
116	12000	1200	200
105	10000	1000	200

- First Create the above table with valid constraint and Structure, then write SQL queries for the following:
  1. Display NAME of all doctors who are in "ENT" having more than 10 years experience from the table DOCTOR.
  2. Display the minimum ALLOWANCE of female doctors.
  3. Display the highest consultation fee among all male doctors.
  4. Display the average salary of all doctors working in "SKIN" department using the tables DOCTOR and SALARY where salary = BASIC + ALLOWANCE
  5. Display the total number of female doctors.
  6. Display the details all the doctors who have joined between 1-JAN-2000 and 30-DEC-2005.
  7. Display department names along with its highest salary where the number of doctors exceeds 2.
  8. Display names of all those doctors whose name starts with L or M in descending order.
  9. Display NAME and DEPT all those doctors whose birth place ends with I in ascending order.
  10. Display name of the doctor whose experience is least in the table DOCTOR.
  11. Display the content of DOCTOR table in descending order of experience.
  12. Display average experience of doctors in SKIN department.
  13. Display the total number of departments.
  14. Display the frequency of doctors department wise.
  15. To insert a new row in the DOCTOR table with the following data:  
(120, 'GEORGE', 'ENT', 'M', 10, '10-MAR-2010', 'DELHI')
  16. To increase the BASIC of all those doctors whose CONSULTATION is more than 300 by 10%.
  17. To remove doctor LARA from DOCTOR table.
  18. To add a new attribute PH\_NO of type integer in the DOCTOR table.
  19. To modify attribute DEPT of DOCTOR table to have new width of 25 characters.
  20. To modify the value of attribute DEPT from MEDICINE to NEURO-SURGERY of the doctors having more than 10 years of experience.

## PHYSICAL EDUCATION

1. Write and explain five concentration 'ASANAS'.
2. Write down types of disabilities, its causes and nature.
3. Write and explain effects of exercises on cardio respiratory system.
4. Briefly explain sports injuries of the following:
  - a. Soft tissue injuries
  - b. Bone injuries
  - c. Joint injuries
5. Calculate the physical fitness index for a 12 year old boy having completed Harvard step test for a duration of 3 minutes and a pulse rate of 54 beat for 1-1.5 min, 50 beats for 2-2.5 minutes and 46 beats for 3-3.5 minutes.