

**ST. FRANCIS XAVIER SCHOOL**  
**SPECIMEN QUESTION PAPER (BIOLOGY XII)**  
**2022-2023**

**Time: 1 1/2 Hours**

**Maximum Marks: 40**

**General Instructions:**

- (i) *All questions are compulsory.*
- (ii) *There are 18 questions in the question paper.*
- (iii) *There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.*
- (iv) *Wherever necessary, neat and properly labeled diagrams should be drawn.*

	Questions	Marks
1.	What are the two distinct phases found in the life cycle of higher plants?	1
2.	Embryo sac is to ovule ----- is to an anther.	1
3.	In a flower, if a megaspore mother cell forms megaspores without undergoing meiosis and if one of the megaspores develops into an embryo sac, what will be the ploidy of its nuclei ?	1
4.	What is the cotyledon of maize grain technically called?	1
5.	A snapdragon plant with violet flowers was crossed with another such plant with white flowers. The F1 progeny obtained had pink flowers. Explain, in brief, the inheritance pattern seen in offsprings of F1 generation?	1
6.	Differentiate between aneuploidy and euploidy.	1
7.	What is the ploidy of PEN?	1
8.	What is Mendelian genotypic dihybrid ratio?	1
9.	What is the chromosomal configuration in an individual with Turner's Syndrome?	1
10.	A haemophilic son was born to normal parents. Give the genotypes of the parents.	1

11.	<p><b>Assertion:</b> Mendel successfully formulated the laws of heredity..</p> <p><b>Reason:</b> Mendel did not carry the the study of one character at a time.</p> <ol style="list-style-type: none"> <li>Both assertion and reason are true, and reason is the correct explanation of assertion.</li> <li>Both assertion and reason are true, but reason is not the correct explanation of assertion.</li> <li>Assertion is true but reason is false.</li> <li>Both assertion and reason are false.</li> </ol> <p style="text-align: center;"><b>OR</b></p> <p><b>Assertion:</b> An organism with lethal mutation may not even develop beyond the zygote stage.</p> <p><b>Reason:</b> All types of gene mutations are lethal.</p> <ol style="list-style-type: none"> <li>Both assertion and reason are true, and the reason is the correct explanation of the assertion.</li> <li>Both assertion and reason are true, but the reason is not the correct explanation of the assertion.</li> <li>Assertion is true but reason is false.</li> <li>Both assertion and reason are false</li> </ol>	1
12.	<p><b>Assertion:</b> Multiple genes are group of genes located at different loci and involved in the expression of one character. They are also called cumulative genes.</p> <p><b>Reason:</b> Cumulative gene control colour of wheat kernel, skin colour in humans and height in man.</p> <ol style="list-style-type: none"> <li>Both assertion and reason are true, and the reason is the correct explanation of the assertion.</li> <li>Both assertion and reason are true, but the reason is not the correct explanation of the assertion.</li> <li>Assertion is true but reason is false.</li> <li>Both assertion and reason are false</li> </ol>	1
13.	<p>In a plant tallness is dominant over dwarfness and red flower is dominant over white. Starting with the parents work out a dihybrid cross. What is standard dihybrid ratio? Do you think the values would deviate if two genes in question are interacting with each other?</p>	5

14.	(a) In humans, males are heterogametic and females are homogametic. Explain. Are there any examples where males are homogametic and females heterogametic? (b) Also describe as to, who determines the sex of an unborn child?	5
15.	Draw a well labelled diagram of - (i) Life cycle of a typical angiospermic plant (ii) An anatropous ovule	5
16.	Colourblindness is a sex linked recessive disease, that shows its transmission from unaffected carrier female to some of the male progeny. Why the possibility of a female becoming a Colourblind is extremely rare? Show with the help of a Punnett square.	5
17.	Discuss the pollen-pistil interaction leading to seed formation. <b>OR</b> A couple has four children. Each child has a different blood group. Determine the blood groups and genotypes of the couple.	4
18	Describe nuclear and cellular type of development with examples. <b>OR</b> Two couples X (Mr. X and Mrs. Y) and Y (Mr. Y and Mrs. Y) are claiming for the same baby. From blood tests, it is evident that Mr. X has blood group A and Mrs. X has B blood group. Mr. Y has O blood group and Mrs. Y has AB blood group. The child belongs to O blood group. Being a genetic counsellor what would be your suggestion?	4



**ST. FRANCIS XAVIER SCHOOL**

**MODEL PAPER 2022-23**

**CHEMISTRY PAPER – 1**

**CLASS-XII**

**(Max.Marks- 40)**

**(Time-One & half hours)**

*All questions are compulsory.*

*Question 1 to 5 is a one mark all of which are compulsory*

*Question 6 to 10 carry two marks with two Questions having internal choice .*

*Question 11 to 15 carry three marks with two questions having internal choice question .*

*Balanced equation must be given wherever possible and diagrams wherever they are helpful .  
Candidates are allowed additional 5 minutes for only reading the paper they must not start writing during this time .All essential working must be shown in solving numerical problems. Answers to this paper must be written in the test Copy. The intended marks for the questions are given in the brackets[.]*

**Question 1**

Acetaldehyde responds to Tollens reagent test . Explain. [1]

**Question 2**

Presence of Alpha hydrogen in aldehydes and ketones is essential for aldol condensation.Why?  
[1]

**Question 3**

Name the type of isomerism in  $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$  and  $[\text{Co}(\text{NH}_3)_5\text{ONO}]\text{Cl}_2$  [1]

**Question 4**

Why is it advised to add ethylene glycol in car radiator while driving in a hill station?  
[1]

**Question 5**

Name one hexadentate ligand. [1]

**Question 6**

Using nomenclature write the formulas for the following i.tetrahydroxozincate(II)  
ii. hexaamminecobalt(III)sulphate. [2]

**Question 7**

Give chemical test to distinguish between Acetophenone and Benzophenone.

OR

Write the differences between Formaldehyde and Acetone. [2]

### **Question 8**

30g of urea ( $M=60\text{g mol}^{-1}$ ) is dissolved in 846g of water. Calculate the vapour pressure of water

### **Question 9**

[2]

Give equation and observation for the following

Formaldehyde when treated with Tollen's Reagent .

Glucose when treated with Nitric Acid.

### **Question 10**

The boiling point of benzene is 353.23K. When 1.80g of a non-volatile solute was dissolved in 90g of benzene, the boiling point is raised to 354.11K. Calculate the molar mass of the solute. ( $k_B= 2.53\text{K kg mol}^{-1}$ )

OR

What is a biodegradable polymer. Give the monomers

### **Question 11**

[3]

Starting from 10g of a radioactive element, 0.25g was left after 5 years. Calculate

- Rate constant for the decay of the radioactive element.
- The amount left after one year.
- The time required for half of the element to decay.

OR

The rate constant of a reaction is  $1.2 \times 10^{-3} \text{ sec}^{-1}$  at  $30^\circ\text{C}$  and  $2.1 \times 10^{-3} \text{ sec}^{-1}$  at  $40^\circ\text{C}$ . Calculate the energy of activation of the reaction.

### **Question 12**

[3]

The activation energy of a first order reaction at 300K is  $60 \text{ kJ mol}^{-1}$ . In the presence of a catalyst, the activation energy is lowered to  $50 \text{ kJ mol}^{-1}$  at 300K. How many times the reaction rate changes in the presence of a catalyst at the same temperature?

OR

A reaction is found to be zero order. Will its molecularity be zero?

The rate of a reaction triples when temperature changes to  $50^\circ\text{C}$  to  $100^\circ\text{C}$ . Calculate the energy of activation for such a reaction.

### **Question**

Antacids should be taken carefully why name the artificial sweetener used in food articles BHA and BHT are used in daily life state its uses.

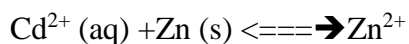
Convert Chloroacetic Acid to Glycine .

[3]

Differentiate between glucose and sucrose.

**Question 14** [3]

Calculate the equilibrium constant for the reaction :



If  $E^0_{\text{Cd}^{2+}/\text{Cd}} = -0.403\text{V}$  and  $E^0_{\text{Zn}^{2+}/\text{Zn}} = -0.763\text{V}$

**Question 15** [3]

Deficiency of which vitamin will cause Scurvy and haemorrhages.

What is zwitterion structure ? Give evidences to show that aminoacids exist as zwitterion?

**Question 16** [5]

Write the IUPAC name of  $\text{K}_2[\text{Zn}(\text{OH})_4]$ .

Give the type of isomerism in the following:

i.  $[\text{PtCl}_2(\text{NH}_3)_4]\text{Br}_2$  and  $[\text{PtBr}_2(\text{NH}_3)_4]\text{Cl}_2$

$[\text{NiCl}_4]^{2-}$  is paramagnetic while  $[\text{Ni}(\text{CO})_4]$  is diamagnetic though both are tetrahedral. Why?

**Question 17** [5]

Arrange in increasing order of acidic acidity: butanoic acid, 3 chlorobutanoic acid to, 2 chlorobutanoic acid and 4 chlorobutane.

Convert Acetic Acid to malonic acid & distinguish benzoic acid and phenol .

**THIS QUESTION PAPER CONSISTS OF 3 PRINTED SIDES.**

**ST. FRANCIS XAVIER SCHOOL**  
**MODEL QUESTION PAPER**  
**COMPUTER SCIENCE**  
**Paper – 1(THEORY)**  
**CLASS – XII**  
*(Three hours)*

**Maximum Marks: 70**

*(Candidates are allowed additional 15 minutes for **only** reading the paper.  
They must **NOT** start writing during this time)*

Answer **all** questions in Part I (compulsory) and **six** questions from Part-II, choosing **two** questions from Section-A, **two** from Section-B and **two** from Section-C.

All working, including rough work, should be done on the same sheet as the rest of the answer.  
The intended marks for questions or parts of questions are given in brackets [ ].

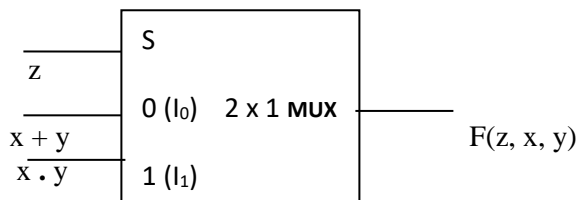
**PART I**

Answer **all** questions

While answering questions in this Part, indicate briefly your working and reasoning, wherever required.

**Question 1**

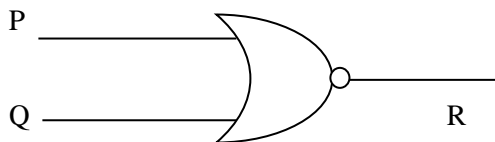
- a) Using truth table verify the following expression:  $A.(B +C) = A.B + A.C$  [1]  
b) Find the boolean function  $F(z, x, y)$  and express it in simplified SOP format [1]



- c) Draw the truth table and logic circuit for a 2 – input XOR gate. [1]  
d) Find the complement of the expression:  $P' + PQ'$  [1]  
e) Convert the following Sum of Product expression into its corresponding Product of Sums form: [1]  
 $F(O,V,W)= O'V'W' + O'V'W+O'VW+OV'W$

**Question 2**

- a) Answer the following questions related to the gate given below: [2]



- i) What is the output of the above gate if input  $P= 0, Q=1$  ?  
ii) What are the values of the inputs if output  $R = 1$ ?  
b) State how a binary tree is a recursive data structure [2]  
c) Convert the following infix notation into its postfix form: [2]  
 $A + (( B+ C) + ( D + E) * F) / G$   
d) An array  $ARR[10][5]$  is stored in memory with each element requiring 2 bytes of storage. If the first element  $ARR[0][0]$  is stored at the location 1250, calculate the location of  $ARR[5][6]$  when it is stored row major wise. [2]  
e) Let First be name of a class in Java.What does  $First( )$  indicate- Explain your answer. [2]

**This Paper consists of 6 printed pages**



### Question 3

The following function fun( ) is a part of some class. What will be the output of the function [5]  
fun( ) when the value of n is "FEATURE" and the value of p is 5. Show the dry run/ working:  
class Trial1

```
{
  public void fun(String n, int p)
  {
    if(p<0)
      System.out.println(" ");
    else
    {
      System.out.println(n.charAt(p)+".");
      fun(n,p-1);
      System.out.print(n.charAt(p));
    }
  }
}
```

### PART – II

Answer **six** questions in this part, choosing **two** questions from Section A, **two** from Section B and **two** from Section C.

#### SECTION - A

Answer any **two** questions.

### Question 4

a) Given the Boolean function  $F(A,B,C,D) = \sum(4,6,7,10,11,12,14,15)$

i) Reduce the above expression by using 4 variable K- map, showing the various groups (i.e. octals, quads and pairs).

ii) Draw the logic gate diagram of the reduced expression. Assume that the variables and their complements are available as inputs. [4 + 1 = 5]

b) Given the Boolean function  $F(P,Q,R,S) = \pi(0,5,7,8,10,12,13,14,15)$

i) Reduce the above expression by using 4 variable K- map, showing the various groups.

ii) Draw the logic gate diagram of the reduced expression. Assume that the variables and their complements are available as inputs. [4 + 1 = 5]

### Question 5

The principal of a school intends to select students for admission to Class XI on the following criteria:

- Student is of the same school and has passed the Class X Board Examination with more than 65% marks.

OR

- Student is of the same school, has passed the Class X Board Examination with less than 65% marks but has taken active part in co-curricular activities.

OR

- Student is not from the same school but has either passed the Class X board Examination with more than 65% marks or has participated in Sports at the national level.

The inputs are :

INPUTS

S - Student is of the same school

P - Has passed the Class X Board Examination with more than 65% marks.

C - Has taken active part in co-curricular activities.

T - Has participated in sports at the National Level.

OUTPUT :-

X – Denotes admission status [ 1 indicates granted and 0 indicates refused in all the cases.]

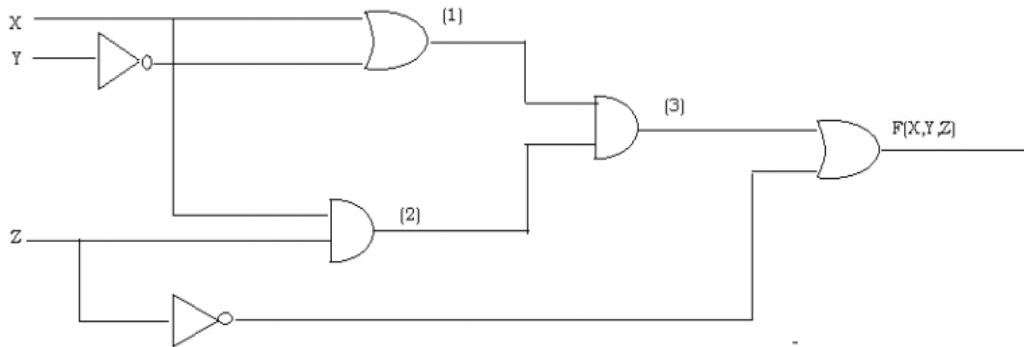
Draw the truth table for the inputs and outputs given above and write the SOP expression.

- a) Draw the truth table for the inputs and outputs given above and write the SOP expression. [5]  
 b) Reduce X(S,P,C,T) using Karnaugh’s map.

Draw the logic gate diagram for the reduced SOP expression for X(S,P,C,T) using AND and OR gate. You may use gates with two or more inputs. Assume that the variable and their complements are available as inputs. [5]

**Question 6**

- a) Verify algebraically  $X'Y'Z' + X'Y'Z + X'YZ + X'YZ' + XY'Z' + XY'Z = X' + Y'$  [2]  
 b) From the following the diagram, name the outputs (1), (2) and (3). Finally derive the Boolean expression and simplify it to show that it represents a logic gate. Name and draw the logic gate. [4]



c) Consider the following truth table where A and B are two inputs and X is the output:

A	B	X
0	0	0
0	1	1
1	0	1
1	1	0

- i) Name and draw the logic gate for the given truth table. [2]  
 ii) Write the SOP and POS of X(A,B) [2]

**SECTION – B**

Answer any **two** questions

Each program should be written in such a way that it clearly depicts the logic of the problem.

This can be achieved by using mnemonic names and comments in the program.

(Flowcharts and Algorithms are **not** required)

**The programs must be written in Java.**

**Question 7**

a) Sum =  $1 + \frac{x}{1!} + \frac{x^3}{2!} + \frac{x^5}{3!} + \dots + \frac{x^{2n-1}}{n!}$

A class Seriessum has been defined to calculate sum of the above series. Some of the members of the class are given below : [9]

Class name	:	Seriessum
Data members		
x, n	:	integer
sum	:	double
Member functions/methods		
Seriessum( )	:	Constructor
int factorial(int n)	:	Calculates and returns factorial of n(i.e n!) where n!= 1 x 2 x 3 x ..... x n
double term(int p, int q)	:	Calculates and returns the value of p/q! by making use of function factorial(int)
void accept( )	:	Inputs the value of member data x, n.
void displaysum( )	:	Displays the value of member data sum.
double calsum( )	:	Calculates the sum of the given series using the appropriate data and other member function.

Design a class according to the given specifications and give the details of the functions mentioned above. Assume that other member functions are written for you and you need not write the main function.

b) What care should you take while designing double term(int , int ) ? [1]

**Question 8**

Design a class Exchange to accept a sentence and interchange the first alphabet with the last alphabet for each word in the sentence, with single letter word remaining unchanged. The words in the input are separated by a single blank space and terminated by a full stop. [10]

**Example:**

Input: It is a warm day.

Output: tI si a marw yad

Some of the data members and member functions are given below:

**Class Name : Exchange**

**Data members**

sent : stores the sentence  
 rev : to store the new sentence  
 size : stores the length of the sentence

**Member functions**

Exchange() : default constructor  
 void readsentence() : to accept the sentence  
 void exfirstlast() : extract each word and interchange the first and last alphabet of the word and form a new sentence.  
 void display() : display the original sentence along with the new changed sentence.  
 Specify the class Exchange giving details of the functions mentioned above. Define the main() function to create an object and call the functions accordingly to enable the task.

**Question 9**

Two matrices are said to be equal if they have the same dimension and their corresponding elements are equal. For example, the two matrices A and B given below are equal: [10]

Matrix A

1	2	3
2	4	5
3	5	6

Matrix B

1	2	3
2	4	5
3	5	6

Design a class EqMat to check if two matrices are equal or not. Assume that the two matrices have the same dimension.

Some of the members of the class are given below:

**Class name** : EqMat

Data members/instance variables:

a[ ][ ] : to store integer elements

m : to store the number of rows

n : to store the number of columns

**Member functions/methods:**

EqMat(int mm, int nn) : parameterised constructor to initialise the data members m = mm and n = nn

void readarray( ) : to enter elements in the array

int check(EqMat P, EqMat Q) : checks if the parameterized objects P and Q are equal and returns 1 if true, otherwise returns 0

void print( ) : displays the array elements

Define the class EqMat giving details of the given. Define the main( ) function to create objects and call the functions accordingly to enable the task.

### SECTION – C

*Answer any two questions*

*Each Program should be written such that it clearly depicts the logic of the problem  
This can be achieved by using comments in the program and mnemonic names or pseudo codes for algorithms. The program must be written in Java and the algorithms must be written in general / standard form, wherever required / specified.*

(Flowcharts are **not** required.)

#### Question 10

Link is an entity which can hold a maximum of 50 integers. Link enables the user to add elements from the rear end and remove integers from the front end of the entity. Define a class Link with the following details:

**Class Name** : Link

**Data members**

lnk[ ] : entity to hold the integer elements.

max : stores the maximum capacity of the entity.

begin : to point to the index of the front end.

end : to point to the index of the rear end.

**Member functions**

Link(int mm) : constructor to initialize max=mm, begin=0, end=0.

void addlink(int v) : to add an element from the rear index if possible otherwise display the message “OUT OF SIZE “.

int dellink() : to remove and return an element from the front index, if possible otherwise display the message “ EMPTY... “ and return -99.

void display() : displays the elements of the entity.

Specify the class Link giving details of the above mentioned functions. THE MAIN FUNCTION AND ALGORITHM NEED NOT BE WRITTEN. [5]

#### Question 11

A super class **Detail** has been defined to store the details of a customer. Define a subclass **Bill** to compute the monthly telephone charge of the customer as per the chart given below:

Number Of Calls	Rate
1 – 100	Only Rental charge
101 – 200	60 paisa per call + rental charge
201 – 300	80 paisa per call + rental charge
Above 300	1 rupee per call + rental charge

The details of both the classes are given below:

**Class Name : Detail**

**Data members / Instance variables:**

**name :** to store the name of the customer.

**address :** to store the address of the customer.

**telno :** to store the phone number of the customer.

**rent :** to store the monthly rental charge

**Member functions:**

**Detail(...)** : parameterized constructor to assign values to data members.

**void show( )** : to display the detail of the customer.

**Class Name : Bill**

**Data members / Instance variables:**

**n :** to store the number of calls.

**amt :** to store the amount to be paid by the customer.

**Member functions:**

**Bill(...)** : constructor to assign values to data members of both classes and initialize amt = 0.0.

**void cal( )** : calculates the monthly telephone charge as per the table given above.

**void show( )** : to display the detail of the customer and amount to be paid.

Assume that the super class Detail has been defined. Using the concept of inheritance, specify the class Bill giving the details of the above mentioned methods. The main( ) and algorithm need NOT be written.

**Question 12**

a) A linked list is formed from the objects of the class,

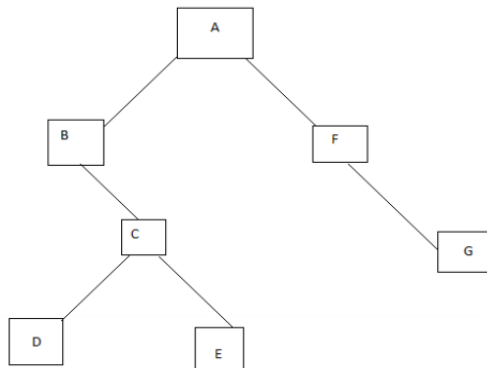
class node

```
{ int p;
  String n;
  node next; }
```

Write an algorithm or a method to search for a name and display the contents of the node. The method

declaration is: **void search(node start, String b)** [3]

b) Answer the following from the diagram of the binary tree given below:



i) External nodes of the tree.

[1]

ii) Right subtree of node B.

[1]

**St. Francis Xavier School**

**Class: XII Session : 2022-23**

**Subject: Mathematics**

F.M. : 40

Time : 1 ½ hrs

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*This Question paper has 3 parts – A, B and C. Part A contains 1 mark questions (Very Short type Questions) and Part B contains Short Type and Long Answer type questions) and Part C contains MCQs on Case Based Type.*  
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**PART A [ 1x8 = 8]**

- Q1. Check whether the function  $f: R \rightarrow R$  defined as  $f(x) = x^3$  is one-one or not.  
Q2. How many reflexive relations are possible in a set A whose  $n(A) = 3$ .

**OR**

A relation R in  $S = \{1,2,3\}$  is defined as  $R = \{(1, 1), (1, 2), (2, 2), (3, 3)\}$ . Which element(s) of relation R be removed to make R an equivalence relation?

- Q3. A relation R in the set of real numbers  $\mathbf{R}$  defined as  $R = \{(a, b): \sqrt{a} = b\}$  is a function or not. Justify

**OR**

An equivalence relation R in A divides it into equivalence classes  $A_1, A_2, A_3$ . Find the value of  $A_1 \cup A_2 \cup A_3$  and  $A_1 \cap A_2 \cap A_3$

- Q4. If A and B are matrices of order  $3 \times n$  and  $m \times 5$  respectively, then find the order of matrix  $5A - 3B$ , given that it is defined.  
Q5. Find the value of  $A^2$ , where A is a  $2 \times 2$  matrix whose elements are given by

$$A_{ij} = \begin{cases} 1 & \text{if } i \neq j \\ 0 & \text{if } i = j \end{cases}$$

**OR**

Given that A is a square matrix of order  $3 \times 3$  and  $|A| = -4$ . Find  $|\text{adj } A|$

- Q6. Let  $A = [a_{ij}]$  be a square matrix of order  $3 \times 3$  and  $|A| = -7$ . Find the value of  $a_{11} A_{21} + a_{12} A_{22} + a_{13} A_{23}$

where  $A_{ij}$  is the cofactor of element  $a_{ij}$

- Q7. Find  $\int e^x(1 - \cot x + \operatorname{cosec}^2 x) dx$

- Q8. The probabilities of A and B solving a problem independently are  $1/3$  and  $1/4$  respectively. If both of them try to solve the problem independently, what is the probability that the problem is solved?

**PART B [ 3x4 = 12]**

- Q9. Express  $\tan^{-1}\left(\frac{\cos x}{1 - \sin x}\right)$ ,  $-\frac{3\pi}{2} < x < \frac{\pi}{2}$  in the simplest form.

- Q10. If A is a square matrix of order 3 such that  $A^2 = 2A$ , then find the value of  $|A|$ .

OR

If  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ , show that  $A^2 - 5A + 7I = O$ .

Hence find  $A^{-1}$ .

Q11. Find the equation of the normal to the curve  $y = x + 1/x$ ,  $x > 0$  perpendicular to the line  $3x - 4y = 7$ .

**PART C [ (5x2)x2 = 20]**

Q12. In an office three employees Vinay, Sonia and Iqbal process incoming copies of a certain form. Vinay process 50% of the forms. Sonia processes 20% and Iqbal the remaining 30% of the forms. Vinay has an error rate of 0.06, Sonia has an error rate of 0.04 and Iqbal has an error rate of 0.03.



Based on the above information answer the following:

(i) The conditional probability that an error is committed in processing given that Sonia processed the form is :

- a) 0.0210
- b) 0.04
- c) 0.47
- d) 0.06

(ii) The probability that Sonia processed the form and committed an error is :

- a) 0.005
- b) 0.006
- c) 0.008
- d) 0.68

(iii) The total probability of committing an error in processing the form is

- a) 0
- b) 0.047
- c) 0.234
- d) 1

(iv) The manager of the company wants to do a quality check. During inspection he selects a form at random from the days output of processed forms. If the form selected at random has an error, the probability that the form is **NOT** processed by Vinay is :

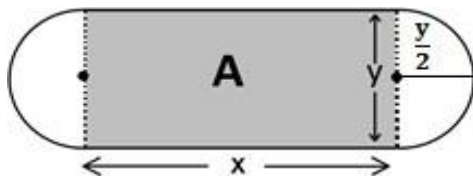
- a) 1
- b)  $\frac{30}{47}$
- c)  $\frac{20}{47}$
- d)  $\frac{17}{47}$

(v) Let A be the event of committing an error in processing the form and let E1, E2 and E3 be the events that Vinay, Sonia and Iqbal processed the form. The value of  $\sum_{i=1}^3 P(E_i | A)$  is

- a) 0
- b) 0.03
- c) 0.06
- d) 1

Q13. An architect designs a building for a multi-national company. The floor consists of a rectangular region with semicircular ends having a perimeter of 200m as shown below:

### Design of Floor



Based on the above information answer the following:

(i) If x and y represents the length and breadth of the rectangular region, then the relation between the variables is

- a)  $x + \pi y = 100$
- b)  $2x + \pi y = 200$
- c)  $\pi x + y = 50$
- d)  $x + y = 100$

(ii) The area of the rectangular region A expressed as a function of x is

- a)  $\frac{2}{\pi} (100x - x^2)$
- b)  $\frac{1}{\pi} (100x - x^2)$



- c)  $\frac{x}{\pi} (100 - x)$   
 d)  $\pi y^2 + \frac{2}{\pi} (100x - x^2)$

(iii) The maximum value of area A is

- a)  $\frac{\pi}{3200} m^2$   
 b)  $\frac{3200}{\pi} m^2$   
 c)  $\frac{5000}{\pi} m^2$   
 d)  $\frac{1000}{\pi} m^2$

(iv) The CEO of the multi-national company is interested in maximizing the area of the whole floor including the semi-circular ends. For this to happen the value of x should be

- a) 0 m  
 b) 30 m  
 c) 50 m  
 d) 80 m

(v) The extra area generated if the area of the whole floor is maximized is :

- a)  $\frac{3000}{\pi} m^2$   
 b)  $\frac{5000}{\pi} m^2$   
 c)  $\frac{7000}{\pi} m^2$   
 e) No change both areas are equal
-

**ST. FRANCIS XAVIER SCHOOL, KOLKATA**

**CLASS: XII**

**Model Test Paper**

**Accounts**

**(Three hours)**

**Maximum Marks: 40**

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Candidates are allowed an additional 10 minutes for reading the paper  
They must not start writing during this time.

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Answer Question 1 (compulsory) from Part I and any five questions from Part II.  
The intended marks for questions are given in brackets [ ].

**PART I (10 Marks)**

Answer all questions

**QUESTION 1.**

**(2\*5)**

- i. Why is Profit and Loss Adjustment Account prepared? Explain.
- ii. Pick the odd one out from the following:
  - a. Interest allowed on a loan taken by the firm from a partner
  - b. Rent due to a partner of the firm for using his premises for business purposes
  - c. Salary due to a partner of the firm
  - d. Salary due to the manager of the firm
- iii. In the absence of a partnership deed, specify the rules relating to the following:
  - a. Sharing of profits and losses.
  - b. Interest on partner's capital.
  - c. Interest on Partner's drawings.
  - d. Interest on Partner's loan
- iv. X, Y, and Z have been sharing profits in the ratio of 3:2:4. Y retired. X and Z take Y's share equally. The new profit-sharing ratio will be:
  - a. 3:4
  - b. 1:2
  - c. 1:1

- d. 4:5
- v. Give two circumstances under which the fixed capitals of partners may change.

## PART – II (5\*6)

### QUESTION 2

Nidiya Limited was incorporated on 1st April 2017 with a registered office in Mumbai. The capital clause of the memorandum of Association reflected a registered capital of 8,00,000 equity shares of Rs.10 each and 1,00,000 preference shares of Rs.50 each. Since some large investments were required for building and machinery the company in consultation with vendors, Ms .VPS Enterprises issued 1,00,000 equity shares and 20,000 preference shares at par with them in full consideration of assets acquired. Besides this, the company issued 2,00,000 equity shares for cash at par payable as Rs 3 on application, 2 on the allotment, 3 on the first call, and 2 on the second call. To date, the second call has not yet been made and all the shareholders have paid except Mr. Ajay who did not pay allotment and calls on his 300 shares and Mr. Vipul who did not pay the first call on his 200 shares. Shares of Mr. Ajay were then forfeited and out of them, 100 shares were reissued at Rs.12 per share.

Based on the above information you are required to answer the following questions.

- a. Shares issue to vendors of building and machinery, Ms. VPS Enterprises, would be classified as:
  - 1. Preferential Allotment
  - 2. Employee Stock Option Plan
  - 3. Issue for Consideration other than cash
  - 4. Right Issue of Shares
- b. How many equity shares of the company have been subscribed?
  - 1. 3,00,000
  - 2. 2,99,500
  - 3. 2,99,800
  - 4. None of these
- c. What is the amount of security premium reflected in the balance sheet at the end of the year?
  - 1. ₹200
  - 2. ₹600
  - 3. ₹400

4. ₹ 1,000
- d. What amount of share forfeiture would be reflected in the balance sheet?
1. ₹600
  2. ₹900
  3. ₹200
  4. ₹ 300

### Question 3

Aakriti and Bindu entered into partnership for making garment on April 01, 2016 without any Partnership agreement. They introduced Capitals of Rs 5,00,000 and Rs 3,00,000 respectively on October 01, 2016. Aakriti Advanced. Rs 20,000 by way of loan to the firm without any agreement as to interest. Profit and Loss account for the year ended March 2017 showed profit of Rs 43,000. Partners could not agree upon the question of interest and the basis of division of profit. You are required to divide the profits between them giving reason for your solution.

### QUESTION 4.

Rakhi and Shikha are partners in a firm, with capitals of Rs 2,00,000 and Rs 3,00,000 respectively. The profit of the firm, for the year ended 2016-17 is Rs 23,200. As per the Partnership agreement, they share the profit in their capital ratio, after allowing a salary of Rs 5,000 per month to Shikha and interest on Partner's capital at the rate of 10% p.a. During the year Rakhi withdrew Rs 7,000 and Shikha Rs 10,000 for their personal use. You are required to prepare Profit and Loss Appropriation Account and Partner's Capital Accounts.

### QUESTION 5.

Amann, Babita and Suresh are partners in a firm. Their profit-sharing ratio is 2:2:1. Suresh is guaranteed a minimum amount of Rs 10,000 as share of profit, every year. Any deficiency on that account shall be met by Babita. The profits for two years ending December 31, 2016 and December 31, 2017 were Rs 40,000 and Rs 60,000, respectively. Prepare the Profit and Loss Appropriation Account for the two years.

#### QUESTION 6.

The partnership agreement between Maneesh and Girish provides that:

- (i) Profits will be shared equally;
- (ii) Maneesh will be allowed a salary of Rs 400 p.m;
- (iii) Girish who manages the sales department will be allowed a commission equal to 10% of the net profits, after allowing Maneesh's salary;
- (iv) 7% interest will be allowed on partner's fixed capital;
- (v) 5% interest will be charged on partner's annual drawings;
- (vi) The fixed capitals of Maneesh and Girish are Rs 1,00,000 and Rs 80,000, respectively. Their annual drawings were Rs 16,000 and 14,000, respectively. The net profit for the year ending March 31, 2015 amounted to Rs 40,000;

Prepare firm's Profit and Loss Appropriation Account.

#### QUESTION 7.

Ramesh and Suresh were partners in a firm sharing profits in the ratio of their capitals contributed on commencement of business which were Rs 80,000 and Rs 60,000 respectively. The firm started business on April 1, 2016. According to the partnership agreement, interest on capital and drawings are 12% and 10% p.a., respectively. Ramesh and Suresh are to get a monthly salary of Rs 2,000 and Rs 3,000, respectively.

The profits for year ended March 31, 2017 before making above appropriations was Rs 1,00,300. The drawings of Ramesh and Suresh were Rs 40,000 and Rs 50,000, respectively. Interest on drawings amounted to Rs 2,000 for Ramesh and Rs 2,500 for Suresh. Prepare Profit and Loss Appropriation Account and partners' capital accounts, assuming that their capitals are fluctuating.

#### QUESTION 8.

On March 31, 2017, after the close of books of accounts, the capital accounts of Ram, Shyam and Mohan showed balance of Rs 24,000 Rs 18,000 and Rs 12,000, respectively. It was later discovered that interest on capital @ 5% had been omitted. The profit for the year ended March 31, 2017, amounted to Rs 36,000 and the partner's drawings had been Ram, Rs 3,600; Shyam, Rs 4,500 and Mohan,

Rs 2,700. The profit-sharing ratio of Ram, Shyam and Mohan was 3:2:1. Calculate interest on capital.

#### QUESTION 9.

Ajay, Siddharth and Kusum are partners in a firm, sharing profits in the ratio of 5:3:2. Kusum is guaranteed a minimum amount of Rs 10,000 as per share in the profits. Any deficiency arising on that account shall be met by Siddharth. Profits for the years ending March 31, 2016 and 2017 are Rs 40,000 and 60,000 respectively. Prepare Profit and Loss Appropriation Account.

**ST. FRANCIS XAVIER SCHOOL**  
**CLASS XII**  
**Model Test Paper**  
**COMMERCE**  
*(One and Half Hours)*  
*Maximum Marks: 50*

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*Candidates are not to allowed to write during the first 10 minutes.*

*This time is spent in reading the question paper.*

*The intended marks for questions are given in brackets [ ].*

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**SECTION-A (10x1=10)**

1. Identify and explain in brief the *different dimensions* of business environment from the following:
  - a. An order has been passed by the High Court to ban plastic straws.
  - b. These plastic items are creating environmental problems and waste.
  - c. The government has given a subsidy to the metal industry to promote this business.
  - d. Innovative techniques are being developed to manufacture metal straws at low rates.
  - e. Incomes are rising and people can afford to buy these metal straws.
  
2. Management is:
  - a. A Science;
  - b. An Art;
  - c. both science and art;
  - d. Neither
  
3. Principles of management are NOT:
  - a. Applicable only in large firms;
  - b. Formed by practice and experience of managers;
  - c. Flexible;
  - d. Contingent
  
4. \_\_\_\_\_ is considered a major element of the political environment:
  - a. The extent and nature of government intervention in business;
  - b. planned outlay in public and private sectors;
  - c. Expectations from the work force;
  - d. Administrative order issued by government authorities.
  
5. Astra Builders has to deliver the flats to its buyers on time. Due to this there is a sudden rush of work. Therefore, the company needs to arrange workers to work at the sites at a short notice. The source of recruitment which may be used by the company to tap the casual vacancy is:
  - a. Direct recruitment;
  - b. Advertisement;
  - c. Recommendation of employees;
  - d. Employment Exchange.
  
6. At Support.com, there is no reward or appreciation for a good suggestion. Thus, the subordinates are not willing to offer any useful suggestions to their superiors. Identify the type of barrier to communication that has been created in the firm due to this.
  - a. Semantic barrier;
  - b. Personal barrier;
  - c. Organisational barrier;
  - d. Psychological barrier
  
7. Large scale production done to reduce the average cost of production is the essence of \_\_\_\_\_ concept of Marketing management.

- a) Product;
- b) Selling;
- c) Production;
- d) Marketing

8. Sampriti decided to start a business of selling dress material from her house. She did various online surveys to find out about the preferences of prospective customers. Based on this, she prepared a detailed analysis of the business. She then made important decisions including deciding about the features, quality, packaging, labelling and branding of the dress material. Identify the element of Marketing Mix discussed above.
- (a) Promotion;
  - (b) Market;
  - (c) Product;
  - (d) Place.
9. Fine Foods Ltd., a food delivery service app has recently faced criticism for the tampering of their product, by their delivery boys. Fine Foods Ltd. decided to put a hologram seal on the food packets in order to protect the contents from spoilage, leakage, pilferage, damage, along with a tag with a safety warning for the consumers to check the seal. Which concept of marketing discussed above is performing the important function of communicating with the potential buyer and promoting the sale.
- (a) Branding;
  - (b) Product designing and development;
  - (c) labelling;
  - (d) packaging.
10. Arpita went to a free eye camp & got her eyes operated for cataract. The surgery was not done properly, due to which she lost her vision. Where can she file a complaint under consumer protection act?
- (a) District Forum
  - (b) State Commission
  - (c) National Commission
  - (d) None of above

### **SECTION-B (5x3=15)**

1. 'Delegation of authority, undoubtedly empowers an employee to act for his superior, but the superior would still be accountable for the outcome.' Explain the elements of delegation of authority discussed above.
2. The Research & Development department of Healthy Production Ltd. has decided to diversify from manufacturing health drinks to cereals made from millets. They are well aware of the fact that the company will have to communicate to the people the benefits of eating millets. For this purpose, they plan to sponsor various events like marathons and encourage people to switch to healthy eating through newsletters.
- a) Identify and briefly explain the promotional tool being discussed above.
  - b) Also explain any two other promotional tool that can be used by the company, apart from the one discussed above.
3. Rita Sharma who works as a guard in a school, purchased two shirts for ₹460 each for her son. When she went back home, she realised that the shirt was small in size for her son. She decided to ask for return of money or exchange of the shirt with an appropriate size.
- But the store owner refused to return the money or exchange the shirt. Rita Sharma was



disheartened. Her friend advised her to go to 'Seva Sadan', an autonomous voluntary organisation working for the protection of consumer welfare.

The organisation helped her by explaining to her the legal procedure, as well as educated her about her rights as a consumer and helped her in filing the complaint and getting relief. With the help of the organisation Rita was able to get her money back from the store.

Enumerate the rights of a consumer which Rita Sharma was able to exercise with the help of the voluntary organisation.

4. The Production Manager of Excellent Machineries uses techniques like personal observation, sample checking, performance reports, etc to ensure that all plans are being implemented effectively. Identify the step of controlling process that he is following and also state the next step to be taken by him.
5. Advertising and Personal Selling are synonymous terms. Do you agree? Give reasons.

### **SECTION-C (5x5=25)**

1. 'Coordination is the essence of management'-Justify.
2. Kavya is working in a company on a permanent basis. As per the job agreement she had to work for 8 hours a day and was free to work overtime. Kavya worked overtime. But even after working for long hours and putting in her best efforts, no recognition was given to her by her boss. Due to overtime, she fell ill and had to take leave from work. No one showed concern and enquired about her health. She realised that she was fulfilling only some of her needs while some other needs still remained to be fulfilled.
  - (i) Identify and explain the needs of Kavya discussed in the above para, by quoting the lines.
  - (ii) Also explain two other needs of Kavya followed by the above needs, which still remained to be satisfied.
3. Rishi went to a hill station to spend his summer vacations. He went to a shop to buy a bottle of water. The shopkeeper told him to pay ₹80, even though the printed label of the bottle had ₹60 printed on it as the MRP. Rishi tried to convince the shopkeeper to charge the MRP but he refused. As no shops were available nearby, Rishi was forced to buy the bottle of water.

Which right of Rishi as a consumer has been violated and where can he file a complaint against the shopkeeper?  
Name and explain two other rights of consumers.
4. Name and explain with a suitable example the technique of Scientific Management given by Taylor, with the objective of determining the number of workers to be employed for a task.
5. A reputed publishing company is planning to open new showrooms in some big cities in North India. The company wishes to invite celebrity novelists to inaugurate their new outlets. It also plans to invite other celebrities from the literary world and make new book releases before August. Introductory offers will be given in the form of price reductions, limited edition of autographed copies and discount coupons.
  - (i) Identify the promotional tools adopted by the company.
  - (ii) In what way do the promotional tools adopted by the company generate sales

**ST. FRANCIS XAVIER SCHOOL, KOLKATA**

**CLASS: XII**

**Model Test Paper**

**ECONOMICS**

*(Three hours)*

**Maximum Marks: 80**

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*Candidates are allowed an additional 10 minutes for reading the paper*

*They must not start writing during this time.*

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**Answer Question 1 (compulsory) from Part I and any five questions from Part II.**

*The intended marks for questions are given in brackets [ ].*

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**PART I (20 Marks)**

*Answer all questions.*

**Question 1**

**[2x10=20]**

Answer briefly each of the following questions (i) to (x).

- (i) What is a demand function?
- (ii) What is  $MRS_{xy}$ ?
- (iii) What is income elasticity of demand?
- (iv) What is contraction of supply?
- (v) The market price of wheat is Rs. 80. This is considered to be high from the welfare perspective of the consumers. What should the government do?
- (vi) A firm can vary the use of labourers and machines. What kind of production function is under operation? Define it.
- (vii) Explain the function of money as a 'store of value'.
- (viii) 'Income tax is progressive tax.' Justify the statement.
- (ix) Rs. 1 can purchase \$70. Now by the order of central bank Rs. 1 could purchase \$90. What is happening to Indian rupee?
- (x) Define normal profit.

**PART II (80 Marks)**  
*Answer any five questions.*

**Question 2**

- (a) Rahul is fascinated by the brand new iPhone. But being a student, his pocket money is only Rs. 300. Based on this differentiate between desire and demand. [3]
- (b) Explain any three features of a perfectly competitive market. [3]
- (c) Using cardinal approach, explain consumer's equilibrium. [6]

**Question 3**

- (a) Define a budget line. The price of good X is Rs. 10 and that of good Y is Rs. 5. What is its slope? [3]
- (b) 'The fuel cost has increased'. How will it affect the supply of a commodity? Explain with the help of a diagram. [3]
- (c) 'India is an agricultural country and farming is an important occupation'. What can the government do to protect the farmers from being exploited at very low selling price of crops? [6]

**Question 4**

- (a) Kia car manufacturer purchases a unique radiator specific to Kia cars only. Explain the characteristics of this kind of market. [3]
- (b) 'Taj Mahal' is among one of the seven wonders of the world. What is the price elasticity of supply of Taj Mahal? Explain with reasons. [3]
- (c) Explain the law of variable proportion with proper diagram. [6]

**Question 5**

- (a) A firm purchases a machine for Rs. 20,000 and then hires more workers as it produces

more output. Draw the cost curves. [3]

(b) Explain the relationship between TR, MR and AR under imperfect competition. [3]

(c) Explain the condition for producer's equilibrium under TR-TC approach. [6]

### Question 6

(a) Explain the concept of aggregate demand with special emphasis on its components. [3]

(b) In an economy  $S = -50 + 0.5 Y$  and  $I = 7000$ . Calculate (i) equilibrium level of income  
(ii) consumption expenditure at equilibrium. [3]

(c) Explain the concept of investment multiplier with formula and diagram. [6]

### Question 7

(a) Rohit pays Rs. 50 for a pen to the shopkeeper. Explain this function of money. [3]

(b) Rita has Rs. 50,000 in her current account. She takes a loan of Rs. 70,000 over this. What kind of loan is this? Explain. [3]

(c) Explain the process of credit creation by commercial bank. [6]

### Question 8

(a) What are the components of capital receipts of government budget? [3]

(b) 'India is facing foreign exchange crisis. Explain the measures taken to correct this situation. [3]

(c) Explain the methods of debt redemption. [6]

### Question 9

(a) Complete the following equation: [3]

(i) Net factor income from abroad =  $GNP_{FC}$  - \_\_\_\_\_

(ii)  $NIT = \text{Indirect tax}$  - \_\_\_\_\_

(iii)  $NDP_{MP} = GDP_{MP}$  - \_\_\_\_\_

(iv)  $GNP_{MP} = GDP_{MP}$  + \_\_\_\_\_

(v) Depreciation =  $GNP_{MP}$  - \_\_\_\_\_

(vi)  $GNP = NNP$  + \_\_\_\_\_

(b) Define GDP at market price. How is it different from national income? [3]

(c) With the help of a diagram, explain the circular flow of income in a three sector model. [6]

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