

**ST. PBN PUBLIC SCHOOL  
HALF YEARLY EXAMINATION  
CLASS XII  
SCIENCE  
SAMPLE PAPER**

**TIME: 3 Hours.**

**MM: 70**

**General Instructions:**

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
- (iv) There is no overall choice. However, internal choices have been provided in some questions. Students must attempt only one of the alternatives in such questions.
- (v) Wherever necessary, neat, and properly labeled diagrams should be draw

**SECTION-A**

1. The endosperm cells in angiosperms are:
  - i) Haploid
  - ii) Diploid
  - iii) Triploid
  - iv) Tetraploid
  
2. Amniocentesis is a technique to:
  - i) Determine any disease of heart.
  - ii) Know about the disease of brain.
  - iii) Grow cells on culture medium
  - iv) Determine any disease of the embryo.
  
3. A colour blind male marries a normal female. What percentage of male children of this couple will be colour blind?
  - i) 0%
  - ii) 25%
  - iii) 50%
  - iv) 75%
  
4. The amino acid attaches to the tRNA at it's:
  - i) 5` end
  - ii) 3` end
  - iii) Anticodon
  - iv) DHU loop

5. Analogous organs arise due to:

- i) genetic drift
- ii) convergent evolution
- iii) divergent evolution
- iv) artificial selection.

6. The causal organism of filariasis is:

- i) Trichophyton
- ii) Ascaris lumbricoides
- iii) Entamoeba histolytica
- iv) Wuchereria bancrofti

7 In recombinant DNA technology antibiotics are used:

- i) to keep medium bacteria free
- ii) to detect alien DNA
- iii) as selectable markers
- iv) to impart disease resistance to the host plant.

8. The first human hormone produced by recombinant DNA technology is

- i) Estrogen
- ii) Thyroxin
- iii) progesterone
- iv) Insulin.

9. How many effective codons are for the synthesis of amino acids

- i) 20
- ii) 12
- iii) 64
- iv) 61

10. The lac operon gets switched on when:

- i) RNA polymerase binds to the operator
- ii) lactose is available and it binds to the repressor
- iii) repressor binds to operator.
- iv) none of these.

11. Sertoli cells are:

- i) receptor cells
- ii) nurse cells
- iii) reproductive cells
- iv) none of these.

12. which of the following is not a vestigial organ in man.

- i) tail vertebra
- ii) wisdom tooth
- iii) nail
- iv) vermiform appendix.

## **ASSERTION-REASONS**

In the following questions (13-16), two statements are given—one labeled Assertion (A) and the other labeled Reason (R).

Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

(a) Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

(b) Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

(c) Assertion (A) is correct, but Reason (R) is an incorrect statement.

(d) Assertion (A) is incorrect, but Reason (R) is a correct statement.

13. **Assertion:** ELISA is widely used for the detection of infectious diseases like AIDS.

**Reason:** ELISA is a very sensitive and selective test and needs a very small amount of reagents.

14. **Assertion:** Nitrogen fixation bacteria of legume nodules live in oxygen depleted cells.

**Reason:** Leghaemoglobin completely removes oxygen from the nodule cells.

15. **Assertion:** Spermatogenesis starts at the age of puberty.

**Reason:** there is a significant increase in the level of gonadotropin releasing hormones at puberty.

16. **Assertion:** Guanine cannot pair with cytosine

**Reason:** Guanine and cytosine do not have a perfect matching

### **SECTION-B**

17. Match the items in column A with those of column B:

Column A	Column B
(i) sickle cell anaemia	Viruses infecting bacteria.
(ii) oncogens	Causes AIDS.
(iii) human immunodeficiency virus	Change in single base
(iv) bacteriophages	When activated causes cancer.

18. Describe how biogas is generated from activated sludge. List the components of biogas.

19. Given below are the techniques or instruments with their usage. Which out of these pairs is not the correct matching pair and why?

- (a) PCR - Amplification of nucleic acids.
- (b) Electrophoresis - separation of DNA fragments.
- (c) Bioreactor - production of large quantities of products.
- (d) ELISA - help in movement of molecules for pathogen.

20. Name the technique used for separation of DNA fragments. Write the type of matrix used in this technique. How is the separated DNA visualised and extracted for use in recombinant technology.

21. In a cross between a black and a white guinea pig, all F1 members are black. But F2 generation raised by crossing two such F1 consists of approximately  $\frac{3}{4}$  black and  $\frac{1}{4}$  white guinea pigs.

- a) what are the possible genotypes at each level?
- b) what will the offspring be like if two F2 whites are mated?

Or

Discuss the role of microbes as biofertilizers.

### **SECTION-C**

22. Differentiate between:

- a) hypocotyl and epicotyl
- b) perisperm and pericarp.

23. What is DNA fingerprinting? Mention its application.

24. Two of the steps of technique recombinant DNA technology are mentioned below.

Write the missing steps in proper sequence.

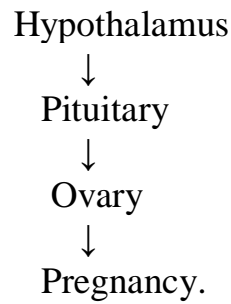
- a. Isolation of the genetic material.
- b.
- c.
- d. Preparation and insertion of recombinant DNA into the host cell/organism.
- e.

25. Name the stage of Plasmodium that gains entry into the human body. Trace the stages of Plasmodium in the body of female Anopheles after its entry.

26. Where are the Leydig cells present? What is their role in reproduction.

Or

Study the flow chart given below. Name the hormones involved at each stage and explain their functions.



27. Fill in the blanks spaces a, b, c, d, e and f given in the following table:

S.No	Name of pathogen	treatment	disease
1	(a)	chloramphenicol	Typhoid
2	(b)	Diethyl carbamazine	filariasis
3	microsporum	miconazole	(c)
4	<i>Ascaris lumbricoides</i>	(d)	ascariasis
5	<i>plasmodium</i>	chloroquine	(e)
6	(f)	zidovudine	AIDS

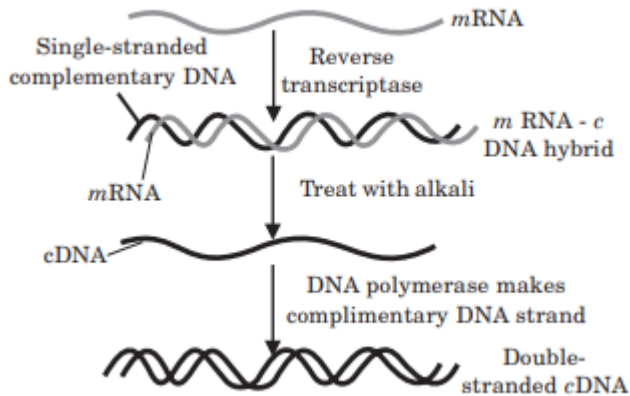
28. Explain the process of fertilization and implantation in human beings.

### **SECTION-D**

#### **CASE BASED QUESTION**

29. Case Study 1: The DNA, which is transferred from one organism into another by joining it with the vehicle DNA is called passenger or foreign DNA. Generally, three types of passenger DNAs are used. These are complementary DNA (cDNA), synthetic DNA (cDNA), and random DNA. Complementary DNA (cDNA) is synthesized on an RNA template (usually mRNA) with the help of reverse transcriptase. Synthetic DNA (cDNA) is synthesized on a DNA template or without a template. Random DNA is small fragments formed by

breaking a chromosome of an organism in the presence of restriction endonucleases.



1. Reverse transcriptase enzyme was discovered by

- (i) Temin and Baltimore
- (ii) Cohen and Boyer
- (iii) Arber and Nathan
- (iv) Paul Berg.

2. During cDNA formation, what would happen if DNA formed by reverse transcriptase is not treated with the alkali?

- (i) cDNA will not be digested
- (ii) mRNA will not be digested
- (iii) Hydrogen bonds will not form between base pairs
- (iv) mRNA will not be formed

3. The enzyme that helps in the formation of double stranded cDNA is

- (i) DNA synthetase
- (ii) ligase
- (iii) DNA polymerase
- (iv) helicase

4. DNA polymerase can be obtained from

- (i) retrovirus
- (ii) Agrobacterium
- (iii) tobacco mosaic virus
- (iv) *Thermus aquaticus*.

30. Case Study 2: The process of translation requires the transfer of genetic information from a polymer of nucleotides to synthesize a polymer of amino acids. The relationship between the sequence of amino acids in a polypeptide and the nucleotide sequence of DNA or mRNA is called genetic code. George Gamow

suggested that in order to code for all the 20 amino acids, code should be made up of three nucleotides.

1) What is the process by which a polymer of nucleotides is used to synthesize a polymer of amino acids?

- i) Replication
- ii) Transcription
- iii) Translation
- iv) Mutation

2) What is the relationship between the sequence of amino acids in a polypeptide and the nucleotide sequence of DNA or mRNA known as?

- i) Genetic Translation
- ii) Genetic Mutation
- iii) Genetic Replication
- iv) Genetic Code

3) How many nucleotides are required to code for one amino acid in the genetic code?

- i) One
- ii) Two
- iii) Three
- iv) Four

4) Which of the following molecules carries the genetic information from DNA to the ribosome for translation?

- i) tRNA
- ii) rRNA
- iii) mRNA
- iv) DNA

### **SECTION-E**

31. How does cell mediated immunity works in human body?

32. Explain the process of development of a male gametophyte in an angiosperm.

33. with diagram describe Meselson and Sthal`s experiment to explain the semiconservative mode of DNA replication.

Or

Describe the clover leaf model of tRNA.

**St. PBN PUBLIC SCHOOL**  
**HALF YEARLY EXAMINATION 2024**  
**CLASS XII**  
**COMPUTER SCIENCE**  
**(SUBJECT CODE-083)**  
**SAMPLE PAPER**

**Time: 3 Hours**

**M.M:70**

**NAME:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**GENERAL INSTRUCTIONS:**

- Please check this question paper contains 35 questions.
- This paper is divided into 5 Sections- A, B, C, D and E
- Section A, consists of 18 questions (1 to 18). Each question carries 1 mark.
- Section B, consists of 7 questions (19 to 25). Each question carries 2 marks.
- Section C, consists of 5 questions (26 to 30). Each question carries 3 marks.
- Section D, consists of 3 questions (31 to 33). Each question carries 5 marks.
- Section E consists of 2 questions (34 to 35). Each question carries 4 marks.
- All programming questions are to be answered using Python Language only.

**SECTION- A**

**Choose the correct option and write in the answer sheet**

**(1 x 18 = 18)**

1. What happens if the base condition isn't defined in recursive programme?
  - (a) Program gets into an infinite loop
  - (b) Program runs once
  - (c) Program runs n number of times, where n is the argument given to the function
  - (d) An exception is thrown
  
2. Fill in the line of code for calculating the factorial of a number :

```
def fun (n):  
If (n>100):  
return n-5  
return fun(fun(n+11))  
print (fun(45))
```

  - (a) 50
  - (b) 100
  - (c) 74
  - (d) Infinite loop
  
3. Which file should be a folder part to be recognized as a package?
  - (a) `__main__`
  - (b) `__int__`
  - (c) `__float__`
  - (d) `__init__`
  
4. \_\_\_\_\_ is a pile in which items are added at one end and removed from the other.
  - (a) Stack
  - (b) Queue
  - (c) List
  - (d) Tuple
  
5. A row of table in a relational model terminology is classified as :



(a) Range

(b) Domain

(c) Relation

(d) Tuple

6. Which of the following python statements will bring the read pointer to 10th character from the end of a file containing 100 characters, opened for reading in binary mode.

(a) File. Seek (10, 0)

(b) File. Seek (10, 0)

(c) File. Seek (-10, 1)

(d) File. Seek (10, 2)

7. The error encountered when a user violates the syntax of a programming language while writing a code are termed as.....

(a) Compile time error

(b) Logical Error

(c) Runtime error

(d) Exception

8. Which of the following options is the correct usage for the tell ( ) of a file object?

(a) It places the file pointer at a desired offset in a file.

(b) It returns the entire content of a file.

(c) It returns the byte position of the file pointer as an integer.

(d) It tells the details about the file.

9. What will the following expression be evaluated to in Python?

```
print ( round (100.0 / 4 + (3 + 2.55) , 1 ) )
```

(a) 30.0

(b) 30.55

(c) 30.6

(d) 31

10. Which of the following modes is used for both writing and reading from a binary file?

(a) wb+

(b)w

(c)wb

(d) w+

11. \_\_\_\_\_ Method establishes a database connection from within Python.

(a) Connect ( )

(b) connector ( )

(c) Connecting ( )

(d) sql.connector( )

12. Which of the following is TRUE about the Candidate key?

(a) Candidate keys are considered for all attributes except the primary key

(b) Both the candidate keys and the primary key are equally strong

(c) Both a & b

(d) None of these

13. Which of the following is an infix expression?

(a) (a+b) \* (c+d)

(b) ab+c\*

(c) +ab

(d) abc+\*

14. Every record in a CSV file is stored in reader object in the form of a list using which method?

(a) writer ( )

(b) reader( )

(c) reader ( )

(d) List( )

15. Identify the correct output of the following Python code:

```
str="My program is program for you"
t = str.partition("program")
print(t)
```

- (a) ('My ', 'program', ' is ', 'program', ' for you')
- (b) ('My ', 'program', ' is program for you')
- (c) ('My ', ' is program for you')
- (d) ('My ', ' is ', ' for you')

16. Which following commands will delete the table from MYSQL database?

- (a) DELETE TABLE
- (b) DROP TABLE
- (c) REMOVE TABLE
- (d) ALTER TABLE

Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as

- (a) Both A and R are true and R is the correct explanation for A
- (b) Both A and R are true but R is not the correct explanation for A
- (c) A is True but R is False
- (d) A is false but R is True

**17. Assertion (A):** A binary file in python is used to store collection objects like lists and dictionaries that can be later retrieved in their original form using pickle module.

**Reason (R):** Binary files are just like normal text files and can be read using a text editor like notepad.

**18 Assertion (A):** RDBMS stands for Relational data base system

**Reason (R):** RDBMS does not allow relating or associating two tables in a data base

### SECTION B

19.(a) What is the output of the following code?

```
def fun1(name, age=20):
    print(name, age)

fun1('Emma', 25)|
```

(b) What is the output of the code shown below?

```
q23class12.py - C:/Users/Lenovo/AppData/Local/Programs/Python/Python310/anu/q23class...
File Edit Format Run Options Window Help
try:
    f = open("demofile.txt", 'w')
    f.write("hello world")
except:
    print("Something went wrong when writing to the file")
finally:
    print("content written")
    f.close()
```

(1+1)

20 a) Write one point of difference between an equi-join and a natural join.

b) Consider the following table CARDEN given below:

C code	Car Name	Make	Color	Capacity	Charges
501	Scorpio	Mahendra	RED	3	14
503	Indigo	Tata	SILVER	3	12
502	Innova	Toyota	WHITE	7	15
509	SX4	Suzuki	SILVER	4	14
510	C Class	Mercedes	RED	4	35

Give the output of the following SQL queries:

(i) SELECT Car Name FROM CARDEN WHERE Capacity=4;

(ii) SELECT MAX(Charges) , MIN(Charges) FROM CARDEN;

(1+1)

21 a) What will be the output of the following string operation?

**str="PYTHON@LANGUAGE"**

**Print (str[2:12:2])**

b) Difference between IO Error and Index Error?

(1+1)

22 Ravi has written a python function to compute the reverse of a number. He has however committed a few errors in his code. Rewrite the code after removing errors also underline the corrections made.

```
define reverse(num) :
    rev = 0
    While num > 0:
        rem == num %10
        rev = rev*10 + rem
        num = num//10
    return rev
print(reverse(1234))
```

(2)

22. a) An SQL table ITEMS contains the following columns:

INO, INAME, QUANTITY, PRICE, DISCOUNT

Write the SQL command to remove the column DISCOUNT from table.

b) Differentiate between DDL and DML. Mention the two commands for each category. (1+1)

23. MySQL table, 'sales' have 10 rows. The following queries were executed on the sales table.

SELECT COUNT (\*) FROM sales;

COUNT(*)
10

SELECT COUNT (discount) FROM sales;

COUNT(discount)
6

Write a statement to explain as to why there is a difference in both the counts.

(2)

24. Predict the output of the Python code given below:

```
data=["L",20,"M",40,"N",60]
times=0
alpha=""
add=0
for c in range(1,6,2):
    times = times + c
    alpha = alpha + data [c-1] + "@"
    add = add + data[c]
print (times, add, alpha)
```

(2)

### SECTION C

(3x 5 = 15)

25. (i) What is the difference between read line ( ) and read lines ( ) function?

(ii) Write a Python program to open the file *hello.txt* in read mode to display its contents. What will be the difference if the file was opened in write mode instead of append mode? (1+2)

26. (i) Why stack is called FIFO data structure?

(ii) Evaluate following postfix expressions while showing status of stack after each operation given A=4, B=5, C=2, D = 3:  $A B * C / D *$  (1+2)

27. Convert  $((A + B) * C / D + E ^ F) / G$  into postfix form showing stack status after every step.

**OR**

Write a function in Python, **Make Push (Package)** and **Make Pop (Package)**, to add a new Package and delete a Package from a List of Package description, considering them to act as push and pop operations of Stack data structure. (3)

28. Write definition of a method MSEARCH (STATES) to display all the state names from a list of STATES which start with the alphabet M.

For example: is the list STATES contains

["MP","UP","WB","TN","MH","MZ","DL","BH","RJ","HR"]

The following should be displayed:

MP

MH

MZ

(3)

29. Write the output for SQL queries (i) to (iii), which are based on the table: SCHOOL and ADMIN given below:

**TABLE: SCHOOL**

CODE	TEACHERNAME	SUBJECT	DOJ	PERIODS	EXPERIENCE
1001	RAVI SHANKAR	ENGLISH	12/03/2000	24	10
1009	PRIYA RAI	PHYSICS	03/09/1998	26	12
1203	LISA ANAND	ENGLISH	09/04/2000	27	5
1045	YASHRAJ	MATHS	24/08/2000	24	15
1123	GANAN	PHYSICS	16/07/1999	28	3
1167	HARISH B	CHEMISTRY	19/10/1999	27	5
1215	UMESH	PHYSICS	11/05/1998	22	16

**TABLE: ADMIN**

CODE	GENDER	DESIGNATION
1001	MALE	VICE PRINCIPAL
1009	FEMALE	COORDINATOR
1203	FEMALE	COORDINATOR
1045	MALE	HOD
1123	MALE	SENIOR TEACHER
1167	MALE	SENIOR TEACHER
1215	MALE	HOD

- (i) SELECT SUM (PERIODS), SUBJECT FROM SCHOOL GROUP BY SUBJECT;
- (ii) SELECT TEACHERNAME, GENDER FROM SCHOOL, ADMIN WHERE DESIGNATION = 'COORDINATOR' AND SCHOOL.CODE=ADMIN.CODE;
- (iii) SELECT COUNT (DISTINCT SUBJECT) FROM SCHOOL; (3)

### SECTION D

(5x 3 = 15)

30. Consider the following tables STOCK and DEALERS:

**Table: STOCK**

Item No	Item	Dcode	Qty	UnitPrice	StockDate
5005	Blue Ball Pen 0.5	102	100	16	31-Mar-10
5003	Black Pen 0.25	102	150	20	01-Jan-10
5002	Blue Gel Pen Premium	101	125	14	14-Feb-10
5006	Black Gel Pen	101	200	22	01-Jan-09

	Classic				
5001	Ruler small	102	210	5	19-Mar-09
5004	Eraser Big	102	60	10	12-Dec-09
5009	Sharpener Classic	103	160	8	23-Jan-09

**Table: DEALERS**

<b>Dcode</b>	<b>D name</b>
101	Reliable Stationers
103	Classic Plastics
104	Fair Deals
102	Clear Deals

Write SQL commands for the given statements from (i) to (iv) and output for (v):

- (i) To display details of all items in the STOCK table in ascending order of StockDate.
- (ii) To display ItemNo and Item name of those items from STOCK table whose UnitPrice is more than 10?
- (iii) To display the details of those items whose dealer code (Dcode) is 102 or Quantity in STOCK (Qty) is more than 100 from the table Stock.
- (iv) To display the Maximum Unit Price of items for each dealer individually as per Dcode from the table Stock
- (v) `SELECT COUNT(DISTINCT Dcode) FROM STOCK;` (5)

**31. (i)** DAV School is managing student data in 'Student' table in 'school' database. Write a Python code that connects to database school and retrieves all records and displays total number of students.

**(ii)** Write SQL commands to create a database TESTDB in MySQL. Also create a table EMPLOYEE with fields FIRST\_NAME, LAST\_NAME, AGE and INCOME. (3+2)

**OR**

**(Option for part (ii) only)**

Write a program to enter the following records in a binary file:

Item\_No      integer  
Item\_Name    string  
Qty            integer  
Price         float

Number of records to be entered should be accepted from the user. Read the file to display the records in the following format:

Item No:  
Item Name:

Quantity:

Price per item:

Amount: (to be calculated as Price \* Qty)

32. (i) What do you mean by candidate key and Foreign Key?

(ii) Write a function in PUSH (Arr), where Arr is a list of numbers. From the list, push all the number divisible by 5 into a stack implementation by using a list. Display the stack if it has at least one element, otherwise display appropriate error message.

(1+4)

### SECTION E

(2 x 4 = 8)

33. Write SQL command for (i) to (iv) on the basis of tables INTERIORS and NEWONES

**Table: INTERIORS**

NO	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	Red rose	Double bed	23/02/02	32000	15
2	Soft touch	Baby cot	20/01/02	9000	10
3	Jerry's home	Baby cot	19/02/02	8500	10
4	Rough wood	Office Table	01/01/02	20000	20
5	Comfort zone	Double bed	12/01/02	15000	20
6	Jerry look	Baby cot	24/02/02	7000	19
7	Lion king	Office Table	20/02/02	16000	20
8	Royal tiger	Sofa	22/02/02	30000	25
9	Park sitting	Sofa	13/12/01	9000	15
10	Dine Paradise	Dining Table	19/02/02	11000	15

**Table: NEWONES**

NO	ITEMNAME	TYPE	DATEOFSTOCKS	PRICE	DISCOUNT
11	White wood	Double bed	23/03/03	20000	20
12	James 007	Sofa	20/02/03	15000	15
13	Tom look	Baby cot	21/02/13	7000	10

- (i) To show all information about the sofas from the INTERIORS table.
- (ii) To list the ITEMNAME which are priced at more than 10,000 from the INTERIORS table.
- (iii) To list ITEMNAME and TYPE of those items, in which DATEOFSTOCK is before 22/01/02 from the INTERIERS table in the descending order of ITEMNAME.
- (iv) To count the number of items, whose type is "Double Bed" from INTERIOR table.

(1+1+1+1)

34. In a Database, there are two tables given below:

Table : EMPLOYEE

EMPLOYEEID	NAME	SALES	JOBID
E1	SAMIT SINHA	1100000	102
E2	VIJAY SINGH TOMAR	1300000	101
E3	AJAY RAJPAL	1400000	103
E4	MOHIT RAMNANI	1250000	102
E5	SHAILJA SINGH	1450000	103

Table : JOB

JOBID	JOBTITLE	SALARY
101	President	200000
102	Vice President	125000
103	Administration Assistant	80000
104	Accounting Manager	70000
105	Accountant	65000
106	Sales Manager	80000

**Write SQL Queries for the following:**

- (i) To display employee ids, names of employees, job ids with corresponding job titles.
- (ii) To display names of employees, sales and corresponding job titles who have achieved sales more than 1300000.
- (iii) To display names and corresponding job titles of those employees who have 'SINGH' (anywhere) in their names.
- (iv) Identify foreign key in the table EMPLOYEE.

(1+1+1+1)



**St. PBN PUBLIC SCHOOL**  
**HALF YAERLY EXAMINATION**  
**CLASS - XII**  
**MATHEMATICS**  
**SAMPLE PAPER**

**Time: 3 Hours**

**M.M:80**

**General instructions:**

- All questions are compulsory.
- Section A consists of 20 questions of 1 mark each.
- Section B consists of 5 questions of 2 marks each.
- Section C consists of 6 questions of 3 marks each.
- Section D consists of 4 questions of 5 marks each.
- Section E has 3 source based/case based/passage based of assessment of 4 marks each with sub parts.
- Use of calculator is not allowed.

**Section A**

1. Show that the relation R in the set {1, 2, 3} given by  $R = \{(1, 2), (2, 1)\}$  is symmetric but neither reflexive nor transitive.
2. Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be defined as  $f(x) = x^2$ . Choose the correct answer
  - (i) f is one-one onto
  - (ii) f is one-one but not onto
  - (iii) f is many-one onto
  - (iv) f is neither one-one nor onto
3. Write the smallest equivalence relation R on set  $A = \{1, 2, 3\}$ .
4. Find the principal value of  $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ .
5.  $\tan^{-1}\left(\frac{x}{y}\right) - \tan^{-1}\frac{x-y}{x+y}$  is equal to
  - (i)  $\frac{\pi}{2}$
  - (ii)  $\frac{\pi}{4}$
  - (iii)  $\frac{\pi}{3}$
  - (iv)  $\frac{-3\pi}{4}$
6.  $A = [a_{ij}]_{m \times n}$  is a square matrix, if
  - (i)  $m < n$
  - (ii)  $m = n$
  - (iii)  $m > n$
  - (iv) none of these
7. If  $n = p$ , then the order of the matrix  $7X - 5Z$  is:
  - (i)  $p \times 2$
  - (ii)  $n \times 3$
  - (iii)  $2 \times n$
  - (iv)  $p \times n$
8. Construct a  $2 \times 2$  matrix  $A = [a_{ij}]$  whose elements are given by  $a_{ij} = \frac{(i+2j)^2}{2}$ .

9. Find the minor of element 8 in matrix  $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ .
10. If A is a square matrix of order 3 and  $|2A| = k|A|$ , then find the value of k.
11. Find the value of k in order that points (5, 5), (k, 1) and (10, 7) are collinear.
12. If A is a square matrix of order 3 such that  $|\text{adj } A| = 64$ , then find  $|A|$ .
13. The normal to the curve  $x^2=4y$  passing (1, 2) is
- (i)  $x+y=3$  (iii)  $x-y=3$   
(ii)  $x+y=1$  (iv)  $x-y=1$
14. The side of a square is increasing at a rate of 0.2 cm/sec. Find the rate of increase of the perimeter of the square.
15. Prove that the function  $x^3-6x^2+12x-18$  is increasing on R.
16.  $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$  equals
- (i)  $\frac{\pi}{3}$  (iii)  $\frac{2\pi}{3}$   
(ii)  $\frac{\pi}{6}$  (iv)  $\frac{\pi}{12}$
17. Evaluate:  $\int \sec x(\sec x + \tan x)dx$ .
18. Evaluate:  $\int \sin 5x \cdot \sin 3x dx$ .

### ASSERTION –REASON BASED QUESTIONS

In the following questions, a statement of Assertion(A) is followed by a statement of Reason(R).

Choose the correct answer out of the following choices.

- a) Both (A) and (R) are true and (R) is the correct explanation of (A).  
b) Both (A) and (R) are true and (R) is not the correct explanation of (A).  
c) (A) is true but (R) is false.  
d) (A) is false but (R) is true.
19. **Assertion(A):** If A is a skew symmetric matrix, then  $A^2$  is a symmetric matrix.  
**Reason(R):** If A is a skew symmetric matrix, then  $A'=-A$ .
20. **Assertion(A):** The possible number of reflexive relations of a set A whose  $n(A) =4$  is  $2^{12}$ .  
**Reason(R):** Number of reflexive relation on a set contain n elements is  $2^{n^2-n}$ .

### Section B

21. Find the value of  $\tan^{-1} \left[ 2 \cos \left( 2 \sin^{-1} \frac{1}{2} \right) \right]$ .
22. Prove that the greatest integer function  $f: \mathbb{R} \rightarrow \mathbb{R}$ , given by  $f(x) = [x]$ , neither one-one nor onto.

23. Find the value of  $x$ ,  $y$  and  $z$  from the following equation:

$$\begin{bmatrix} x + y + z \\ x + z \\ y + z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}.$$

Or

Prove that all the diagonal elements of a skew symmetric matrix are zero.

24. Differentiate  $\sin^2 x$  w.r.t.  $e^{\cos x}$ .

Or

Find  $\frac{dy}{dx}$ , if  $x = a \cos \theta$ ,  $y = a \sin \theta$ .

25. Evaluate:  $\int x \log (1+x) dx$ .

or

Evaluate:  $\int_0^3 \sqrt{9-x^2} dx$ .

### **Section D**

26. The radius of a circle is increasing uniformly at the rate of 3 cm/s. find the rate at which the area of the circle is increasing when the radius is 10 cm.

27. Show that relation  $R$  in the set  $A = \{x \in \mathbb{Z} : 0 \leq x \leq 12\}$ , given by

$R = \{(a, b) : a = b\}$  is an equivalence relation. Find the set of all elements related to 1.

28. For what value of  $x$  :  $[x \quad -5 \quad -1] \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix} \begin{bmatrix} x \\ 4 \\ 1 \end{bmatrix} = 0$ ?

or

Show that the matrix  $B'AB$  is symmetric or skew symmetric according as  $A$  is symmetric or skew symmetric.

29. For what value of  $\lambda$  is the function defined by

$$f(x) = \begin{cases} \lambda(x^2 - 2x), & \text{if } x \leq 0 \\ 4x + 1, & \text{if } x > 0 \end{cases} \text{ continuous at } x=0. \text{ What about continuity at } x=1?$$

30. Prove that the curves  $x=y^2$  and  $xy=k$  cut at right angles if  $8k^2=1$ .

31. Evaluate :  $\int (\sqrt{\tan x} + \sqrt{\cot x}) dx$ .

Or

Evaluate:  $\int_0^{\frac{\pi}{2}} \log(\sin x) dx$ .

### **Section E**

32. For the matrix  $A = \begin{bmatrix} 2 & 3 & 4 \\ 3 & 0 & 1 \\ 2 & 1 & 5 \end{bmatrix}$ ; verify that  $A(\text{adj } A) = (\text{adj } A)A = |A|I_3$ .

Or

If  $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$  then find  $A^{-1}$  and hence solve the system of equations:

$$x + 2y + z = 4, \quad -x + y + z = 0, \quad x - 3y + z = 2$$

33. Find the inverse of the matrix  $\begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$  and verify that

$$A.A^{-1} = A^{-1}.A = I$$

34. Show that the rectangle of maximum area, that can be inscribed in a circle of radius  $r$  is a square of side  $\sqrt{2}r$ .

35. Evaluate:  $\int_0^{\frac{\pi}{4}} \frac{\sin x + \cos x}{\cos^2 x + \sin^4 x} dx$ .

Or

Evaluate:  $\int \frac{dx}{5 + 4 \cos x}$ .

### Section B

36. Case study I:

An aeroplane can carry a maximum of 200 passengers. A profit of Rs. 1000 is made on each executive class ticket and a profit of rs. 600 is made on each economy class ticket. The airline reserves at least 20 seats for the executive class. However at least 4 times as many passengers prefer to travel by economy class, than by executive class tickets is  $x$  and that of economy class ticket is  $y$ .

**Based on the given information, answer the following questions.**

a) The maximum value of  $x+y$  is \_\_\_\_\_ (1)

b) The relation between  $x$  and  $y$  is \_\_\_\_\_ (1)

c) The profit when  $x=20$  and  $y=80$  is \_\_\_\_\_ (2)

or

The maximum profit is Rs. \_\_\_\_\_

37. Case Study II:

The management committee of a residential colony decided to award some of its members (say  $x$ ) for honesty, some (say  $y$ ) for helping others and some others (say  $z$ ) for supervising the workers to kept the colony neat and clean. The sum of all the awardees is 12. Three times the sum of awardees for cooperation and supervision added to two times the number of awardees for honesty is 33. The sum of the number of awardees for honesty and supervision is twice the number of awardees for helping.

**Based on the given information, answer the following questions.**

a)  $x+y+z=$ \_\_\_\_\_ (1)

b)  $x-2y=$ \_\_\_\_\_ (1)

c) The value of z is \_\_\_\_\_ (1)

d) The value of  $x+2y=$ \_\_\_\_\_ (1)

or

The value of  $2x+3y+5z=$ \_\_\_\_\_

38. Case Study III:

$P(x) = -5x^2+125x+37500$  is the total profit function of a company, where x is the production of the company.

a) What will be the production when the profit is maximum? (1)

b) What will be the maximum profit? (1)

c) When the production is 2 units what will be the profit of the company? (1)

d) What will be the production of the company when the profit is 38250? (1)

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ST. PBN PUBLIC SCHOOL  
HALF YEARLY EXAMINATION  
CLASS-XII  
CHEMISTRY  
SAMPLE PAPER

TIME: 3 HRS

M.M.: 70

General Instructions:

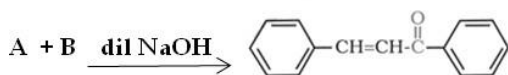
1. There are 35 questions in this question paper with internal choice.
2. SECTION A consists of 18 multiple-choice questions carrying 1 mark each.
3. SECTION B consists of 7 very short answer questions carrying 2 marks each.
4. SECTION C consists of 5 short answer questions carrying 3 marks each.
5. SECTION D consists of 2 case- based questions carrying 4 marks each.
6. SECTION E consists of 3 long answer questions carrying 5 marks each.
7. All questions are compulsory.

**SECTION A**

*The following questions are multiple -choice questions with one correct answer. Each question carries 1 mark. There is no internal choice in this section.*

1. Which of the following is most reactive towards nucleophilic substitution reaction?  
(a) C<sub>6</sub>H<sub>5</sub>Cl (b) CH<sub>2</sub>=CHCl  
(c) ClCH<sub>2</sub>CH=CH<sub>2</sub> (d) CH<sub>3</sub>CH=CHCl

2.



Identify A and B:

- (a) A = 1-phenylethanal , B = acetophenone (b) A = Benzophenone B = formaldehyde  
(c) A= Benzaldehyde , B = Acetophenone (d) A = Benzophenone , B = Acetophenone
3. The vitamins which can be stored in our body are:  
(a) Vitamin A, B, D and E (d) Vitamin A, C, D and K  
(c) Vitamin A, B, C and D (d) Vitamin A, D, E and K
4. What is IUPAC name of the ketone A, which undergoes iodoform reaction to give CH<sub>3</sub>CH=C(CH<sub>3</sub>)COONa and yellow precipitate of CHI<sub>3</sub> ?  
(a) 3-Methylpent-3-en-2-one (b) 3-Methylbut-2-en- one

(c) 2, 3-Dimethylethanone (d) 3-Methylpent-4-one

5. Which of the following is not correct?

- (a) In haloarenes, the electron pairs on halogen atom are in conjugation with  $\pi$ -electrons of the ring.
- (b) The carbon-magnesium bond is covalent and non-polar in nature.
- (c) During  $\text{SN}^1$  reaction, the carbocation formed in the slow step being  $\text{sp}^2$  hybridised is planar.
- (d) Out of  $\text{CH}_2=\text{CH}-\text{Cl}$  and  $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$ ,  $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$  is more reactive towards  $\text{SN}^1$  reaction

6. Match the properties with the elements of 3d series:

- (i) lowest enthalpy of atomisation (p) Sc
- (ii) shows maximum number of oxidation states (q) Mn
- (iii) transition metal that does not form coloured compounds (r) Zn (s) Ti

- (a) (i) (r), (ii) (q), (iii) (p) (b) (i) (r), (ii) (s), (iii) (p)  
(c) (i) (p), (ii) (q), (iii) (r) (d) (i) (s), (ii) (r), (iii) (p)

7. Which of the following statement is true?

- (a) molecularity of reaction can be zero or a fraction.
- (b) molecularity has no meaning for complex reactions.
- (c) molecularity of a reaction is an experimental quantity
- (d) Reactions with the molecularity three are very rare but are fast.

8. In which of the following solvents, the  $\text{C}_4\text{H}_8\text{NH}_3^+\text{X}^-$  is soluble;

- (a) ether (b) acetone (c) water (d) bromine water

9. Which of the reactions below can result in ketones?

- (a) Oxidation of primary alcohols.
- (b) Oxidation of secondary alcohols
- (c) Dehydrogenation of tertiary alcohols
- (d) Dehydrogenation of primary alcohols

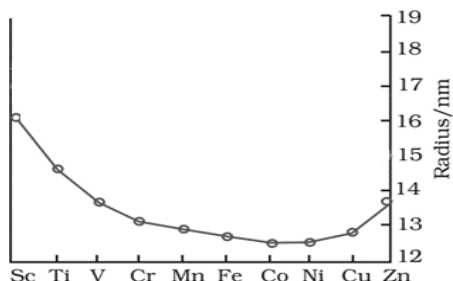
10. If the initial concentration of substance A is 1.5 M and after 120 seconds the concentration of substance A is 0.75 M, the rate constant for the reaction if it follows zero - order kinetics is:

- (a)  $0.00625 \text{ molL}^{-1}\text{s}^{-1}$  (b)  $0.00625 \text{ s}^{-1}$   
(c)  $0.00578 \text{ molL}^{-1}\text{s}^{-1}$  (d)  $0.00578 \text{ s}^{-1}$

11. Anisole undergoes bromination with bromine in ethanoic acid even in the absence of iron (III) bromide catalyst

- (a) Due to the activation of benzene ring by the methoxy group.

- (b) Due to the de-activation of benzene ring by the methoxy group.  
 (c) Due to the increase in electron density at ortho and para positions  
 (d) Due to the formation of stable carbocation.
12. The trend of which property is represented by the following graph?



- (a) ionization enthalpy  
 (b) atomic radii  
 (c) enthalpy of atomization  
 (d) melting point
13. Fac-mer isomerism is associated with which one of the following complexes?  
 (a)  $[M(AA)_2]$   
 (b)  $[MA_3B_3]$   
 (c)  $[M(AA)_3]$   
 (d)  $[MA_4B_2]$
14. Which of the following is formed when an alkyl primary amine reacts with nitrous acid?  
 (a) Alkyl nitrite  
 (b) Secondary amine  
 (c) Nitroalkane  
 (d) Alcohol
15. Given below are two statements labelled as Assertion (A) and Reason (R)  
**Assertion (A):** If one component of a solution obeys Raoult's law over a certain range of composition, the other component will not obey Henry's law in that range.  
**Reason (R):** Raoult's law is a special case of Henry's law.  
 Select the most appropriate answer from the options given below:  
 (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.  
 (e) A is false but R is true



16. Given below are two statements labelled as Assertion (A) and Reason (R)  
**Assertion (A):** Strong oxidising agents oxidise toluene and its derivatives to benzoic acids.  
**Reason (R):** It is possible to stop the oxidation of toluene at the aldehyde stage with suitable reagents.  
Select the most appropriate answer from the options given below:  
(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.
17. Given below are two statements labelled as Assertion (A) and Reason (R)  
**Assertion (A):** Enzymes are very specific for a particular reaction and for a particular substrate.  
**Reason (R):** Enzymes are biocatalysts.  
Select the most appropriate answer from the options given below:  
(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.
18. Given below are two statements labelled as Assertion (A) and Reason (R)  
**Assertion (A):** The order of reaction can be zero or fractional.  
**Reason (R):** The order of a reaction cannot be determined from a balanced chemical reaction.  
Select the most appropriate answer from the options given below:  
(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.

## SECTION B

*This section contains 7 questions. The following questions are very short answer type and carry 2 marks each.*

19. a. Radioactive decay follows first - order kinetics. The initial amount of two radioactive elements X and Y is 1 gm each. What will be the ratio of X and Y after two days if their half- lives are 12 hours and 16 hours respectively?  
b. The hypothetical reaction  $P + Q \longrightarrow R$  is half order w.r.t 'P' and zero order w.r.t 'Q'. What is the unit of rate constant for this reaction?

20. A 5% solution of  $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$  (MW = 322) is isotonic with 2% solution of non-electrolytic, non volatile substance X. Find out the molecular weight of X.
21. (a) Arrange the isomeric dichlorobenzene in the increasing order of their boiling point and melting points.  
 (b) Explain why the electrophilic substitution reactions in haloarenes occur slowly and require more drastic conditions as compared to those in benzene.
22. Express the rate of the following reaction in terms of the formation of ammonia :
- $$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$$
23. (a) Out of p-tolualdehyde and p-nitrobenzaldehyde, which one is more reactive towards nucleophilic addition reactions, why?  
 (a) Write the structure of the product formed when acetone reacts with 2,4 DNP reagent.
24. Convert the following:  
 (a) Benzene to m-nitrobenzaldehyde  
 (b) Bromobenzene to benzoic acid
25. (a) DNA fingerprinting is used to determine paternity of an individual. Which property of DNA helps in the procedure?  
 (b) What structural change will occur when a native protein is subjected to change in pH?

### SECTION C

***This section contains 5 questions with internal choice in one question. The following questions are short answer type and carry 3 marks each.***

26. (a) Write the formula for the following coordination compound Bis(ethane-1,2-diamine) dihydroxidochromium(III) chloride  
 (b) Does ionization isomer for the following compound exist? Justify your answer.  $\text{Hg}[\text{Co}(\text{SCN})_4]$   
 (c) Is the central metal atom in coordination complexes a Lewis acid or a Lewis base? Explain.
27. (a) Where does the water present in the egg go after boiling the egg?  
 (b) Write the name of linkage joining two amino acids.  
 (c) Name the products of hydrolysis of lactose.
28. Write the name of the reaction, structure and IUPAC name of the product formed when:  
 (a)  $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)\text{ONa}$  reacts with  $\text{C}_2\text{H}_5\text{Br}$   
 (b)  $\text{CH}_3\text{CH}_2\text{CN}$  reacts with stannous chloride in the presence of hydrochloric

acid followed by hydrolysis

29. You are given four organic compounds "A", "B", "C" and "D". The compounds "A", "B" and "C" form an orange-red precipitate with 2,4 DNP reagent. Compounds "A" and "B" reduce Tollen's reagent while compounds "C" and "D" do not. Both "B" and "C" give a yellow precipitate when heated with iodine in the presence of NaOH. Compound "D" gives brisk effervescence with sodium bicarbonate solution. Identify "A", "B", "C" and "D" given the number of carbon atoms in three of these carbon compounds is three while one has two carbon atoms. Give an explanation for your answer.

**OR**

When sucrose is hydrolysed the optical rotation values are measured using a polarimeter and are given in the following table:

S.No.	Time (hours)	Specific Rotation
1	0	+ 66.5°
2	∞	-39.9°

- (a) Account for the two specific rotation values.
- (b) What is the specific name given to sucrose based on the above observation?
- (c) One of the products formed during the hydrolysis of sucrose is a glucose, that reacts with hydroxylamine to give compound A. Identify compound A.
30. The rate constants of a reaction at 200K and 500K are  $0.02\text{s}^{-1}$  and  $0.20\text{s}^{-1}$  respectively. Calculate the value of  $E_a$  (Given  $2.303R = 19.15 \text{ JK}^{-1}\text{mol}^{-1}$ )

### SECTION D

*The following questions are case-based questions. Each question has an internal choice and carries 4 (1+1+2) marks each. Read the passage carefully and answer the questions that follow.*

31. Crystal field splitting by various ligands

Metal complexes show different colors due to d-d transitions. The complex absorbs light of specific wavelength to promote the electron from  $t_{2g}$  to  $e_g$  level. The colour of the complex is due to the transmitted light, which is complementary of the colour absorbed.

Complex	Wavenumber of light absorbed ( $\text{cm}^{-1}$ )	Energy of light absorbed ( $\text{kJ/mol}$ )
$[\text{CrA}_6]^{3-}$	13640	163
$[\text{CrB}_6]^{3+}$	17830	213
$[\text{CrC}_6]^{3+}$	21680	259
$[\text{CrD}_6]^{3-}$	26280	314

The wave number of light absorbed by different complexes of Cr ion is given below:

**Answer the following questions:**

- (a) Out of the ligands “A”, “B”, “C” and “D”, which ligand causes maximum crystal field splitting? Why?

**OR**

Which of the two, “A” or “D” will be a weak field ligand? Why?

- (b) Which of the complexes will be violet in colour?  $[\text{CrA}_6]^{3-}$  or  $[\text{CrB}_6]^{3+}$  and why? (Given: If 560 - 570 nm of light is absorbed, the colour of the complex observed is violet.)
- (c) If the ligands attached to  $\text{Cr}^{3+}$  ion in the complexes given in the table above are water, cyanide ion, chloride ion, and ammonia (not in this order)

Identify the ligand; write the formula and IUPAC name of the following:

- (i)  $[\text{CrA}_6]^{3-}$                       (ii)  $[\text{CrC}_6]^{3+}$

32. Read the passage given below and answer the following questions:

A research was conducted for studying coordination number and oxidation number in complexes. Chemical elements most often exhibit coordination number (CN) 6. The next coordination number (in decreasing order) is 4, 5, 7, 8. CNs 3, 2, 9 are significantly less common, which are followed by CN 10-12 and very uncommon CN 1. A large number of CN and certain ON (oxidation number) combinations provide the basis for design of new generation of substances with unique properties. In the control sample CNs 6 and 4 are dominant over a range from CN 1 to CN 12 when CN 5 is found in fewer complexes. Most of the complexing metals have ON +2, ONs +3 and +1 are two to three times less common (over a range from 3 to +8).

(i) The coordination number and oxidation number of Co in  $[\text{Co}(\text{en})_3]^{3+}$  is

- (a) +3, 3                                      (b) 3, 6  
(c) 6, +3                                      (d) 6, 6

(ii) In Complex  $[\text{Fe}(\text{H}_2\text{O})_5\text{NO}]\text{SO}_4$ , oxidation number of Fe is

- (a) +2                      (b) +3  
(c) +1                      (d) None of these

(iii) The oxidation state of Co in  $[\text{Co}(\text{CO})_4]^-$  is

- (a) +2                      (b) +3  
(c) -1                      (d) 0

(iv) The oxidation number and coordination number of Fe in  $[\text{Fe}(\text{CO})_5]$  are respectively

- (a) 1,5            (b) 0,5  
(c) 2,5            (d) 3,5

Or

The coordination number and oxidation number of Co in  $\text{Co}_2(\text{CO})_8$  respectively are

- (a) 0,8            (b) 0,4  
(c) 2,8            (d) 4,0

### SECTION E

*The following questions are long answer type and carry 5 marks each. All questions have an internal choice.*

32. Attempt **any five** of the following:

(a) Which of the following ions will have a magnetic moment value of 1.73 BM?  
 $\text{Sc}^{3+}$ ,  $\text{Ti}^{3+}$ ,  $\text{Ti}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$

(b) The second ionization enthalpies of chromium and manganese are 1592 and 1509 kJ/mol respectively. Explain the lower value of Mn.

(c) Give two similarities in the properties of Sc and Zn.

(d) What is actinoid contraction? What causes actinoid contraction?

(e) What is the oxidation state of chromium in chromate ion and dichromate ion?

(f) Write the ionic equation for reaction of KI with acidified  $\text{KMnO}_4$ .

33. (a) What is the effect of temperature on the solubility of glucose in water?

(b) Ibrahim collected a 10mL each of fresh water and ocean water. He observed that one sample labeled "P" froze at  $0^\circ\text{C}$  while the other "Q" at  $-1.3^\circ\text{C}$ . Ibrahim forgot which of the two, "P" or "Q" was ocean water. Help him identify which container contains ocean water, giving rationalization for your answer.

(c) Calculate Van't Hoff factor for an aqueous solution of  $\text{K}_3[\text{Fe}(\text{CN})_6]$  if the degree of dissociation ( $\alpha$ ) is 0.852. What will be boiling point of this solution if its concentration is 1 molal? ( $K_b=0.52 \text{ K kg/mol}$ )

OR

(a) What type of deviation from Rault's Law is expected when phenol and aniline are mixed with each other? What change in the net volume of the mixture is expected? Graphically represent the deviation.

- (b) The vapour pressure of pure water at a certain temperature is 23.80 mm Hg. If 1 mole of a non-volatile non-electrolytic solute is dissolved in 100g water, Calculate the resultant vapour pressure of the solution.
34. An organic compound with molecular formula  $C_7H_7NO_2$  exists in three isomeric forms, the isomer 'A' has the highest melting point of the three. 'A' on reduction gives compound 'B' with molecular formula  $C_7H_9N$ . 'B' on treatment with  $NaNO_2/HCl$  at  $0-5^\circ C$  to form compound 'C'. On treating C with  $H_3PO_2$ , it gets converted to D with formula  $C_7H_8$ , which on further reaction with  $CrO_2Cl_2$  followed by hydrolysis forms 'E'  $C_7H_6O$ . Write the structure of compounds A to E. Write the chemical equations involved.

(a) Account for the following:

- N-ethylbenzenesulphonyl amide is soluble in alkali.
- Reduction of nitrobenzene using Fe and HCl is preferred over Sn and HCl.

(b) Arrange the following in:

- decreasing order of  $pK_b$  values

$C_6H_5NH_2$ ,  $C_6H_5NHCH_3$ ,  $C_6H_5CH_2NH_2$ ,  $CH_3NH_2$ ,  $NH_3$

- increasing order of solubility in

water  $C_2H_5Cl$ ,  $C_2H_5NH_2$ ,

$C_2H_5OH$

- decreasing boiling point

$CH_3COOH$ ,  $C_2H_5OH$ ,  $CH_3NH_2$ ,  $CH_3OCH_3$



**ST. PBN PUBLIC SCHOOL**  
**HALF YEARLY EXAMINATION**  
**CLASS-XII**  
**PHYSICS**  
**SAMPLE PAPER**

**TIME: 3 HRS.**

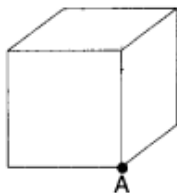
**M.M.: 70**

General Instructions:

- (1) There are 33 questions in all. All questions are compulsory.
- (1) This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
- (2) Section A contains sixteen questions, twelve MCQ and four Assertion Reasoning based of 1 mark each, Section B contains five questions of two marks each, Section C contains seven questions of three marks each, Section D contains two case study based questions of four marks each and Section E contains three long answer questions of five marks each.
- (3) There is no overall choice. However, an internal choice has been provided in one question in Section B, one question in Section C, one question in each CBQ in Section D and all three questions in Section E. You have to attempt only one of the choices in such questions.

**SECTION-A**

1. The total flux through the faces of the cube with side of length  $a$  if a charge  $q$  is Placed at corner A of the cube is



(a)  $\frac{q}{8\epsilon_0}$

(b)  $\frac{q}{4\epsilon_0}$

(c)  $\frac{q}{2\epsilon_0}$

(d)  $\frac{q}{\epsilon_0}$

2. The work done in bringing a unit positive charge from infinite distance to a point at distance  $x$  from a positive charge  $Q$  is  $W$ . Then the potential at that point is



(a)  $\frac{WQ}{x}$

(b) W

(c)  $\frac{W}{x}$

(d) WQ

3. If  $n$  cells each of emf  $e$  and internal resistance  $r$  are connected in parallel, then the total emf and internal resistance will be

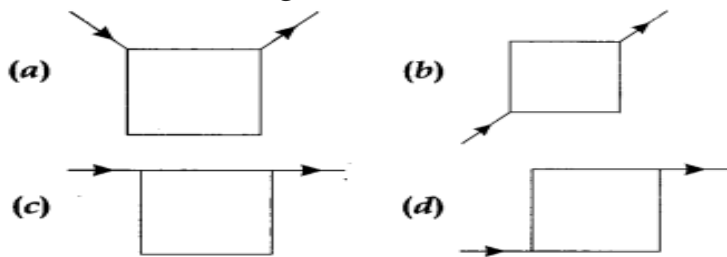
(a)  $\epsilon, \frac{r}{n}$

(b)  $\epsilon, nr$

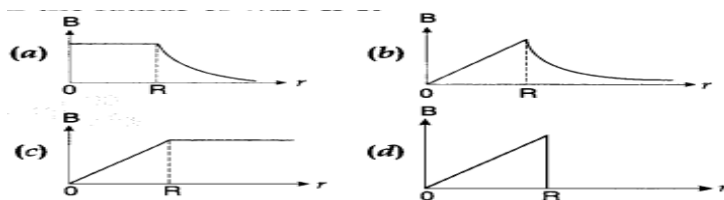
(c)  $n\epsilon, \frac{r}{n}$

(d)  $n\epsilon, nr$

4. Current flows through uniform, square frames as shown in the figure. In which case is the magnetic field at the center of the frame not zero?



5. The correct plot of the magnitude of magnetic field vs. distance  $r$  from center



of the wire is, if the radius of wire is  $R$

A current carrying loop is placed in a uniform magnetic field. The torque acting on it does not depend upon

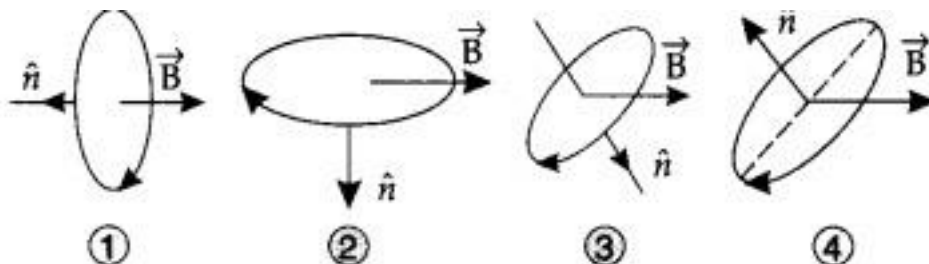
(a) Area of loop

(b) value of current

(c) Magnetic field

(d) none of these

6. A current carrying loop is placed in a uniform magnetic field in four different orientations as shown in figure. Arrange them in the decreasing order of potential energy.



(a) 4, 2, 3, 1

(b) 1, 4, 2, 3

(c) 4, 3, 2, 1

(d) 1, 2, 3, 4

7. Lenz's law is a consequence of the law of conservation of

(a) Charge

(b) energy

(c) Induced emf

(d) induced current

8. An electromagnetic wave can be produced, when charge is

(a) moving with a constant velocity

(b) moving in a circular orbit

(c) falling in an electric field

(d) both (b) and (c)

9. If E and B denote electric and magnetic fields respectively, which of the

(a)  $\sqrt{\mu_0 \epsilon_0} \frac{E}{B}$

(b)  $\mu_0 \epsilon_0 \frac{E}{B}$

(c)  $\mu_0 \epsilon_0 \left(\frac{B}{E}\right)^2$

(d)  $\frac{E \mu_0}{\epsilon_0 B}$

Following is dimensionless? **Directions:** These questions consist of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

(a) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

(b) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

(c) If the Assertion is correct but Reason is incorrect.

(d) If both the Assertion and Reason are incorrect.

**Assertion:** A metallic shield in form of a hollow shell may be built to block an electric field.

**Reason:** In a hollow spherical shield, the electric field inside it is zero at every point.

1. **Assertion:** An emf can be induced by moving a conductor in a magnetic field.

**Reason:** An emf can be induced by changing the magnetic field.

2. **Assertion:** A larger dry cell has higher emf.

**Reason:** The emf of a dry cell is proportional to its size.

3. **Assertion:** Diamagnetic materials can exhibit magnetism.

**Reason:** Diamagnetic materials have permanent magnetic dipole moment.

4. **Assertion:** Free electrons always keep on moving in a conductor even then no magnetic force act on them in magnetic field unless a current is passed through it.

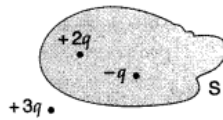
**Reason:** The average velocity of free electron is zero.

5. **Assertion:** The alternating current lags behind the emf by a phase angle of,  $\pi/2$  when AC flows through an inductor.

**Reason:** The inductive reactance increases as the frequency of AC source increases.

### SECTION-B

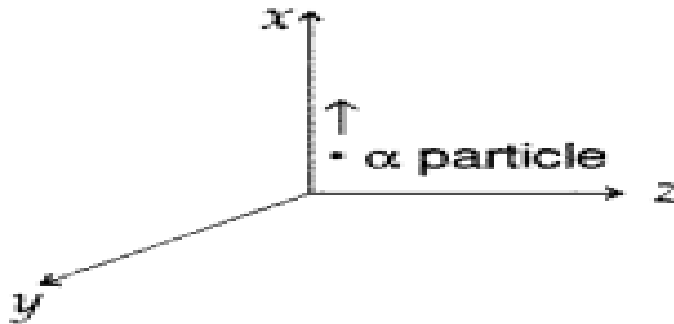
Figure shows three point charges,  $+2q$ ,  $-q$  and  $+3q$ . Two charges  $+2q$  and  $-q$  are enclosed within a surface 'S'. What is the electric flux due to this configuration? Through the surface 'S'



(a) A hollow metal sphere of radius 15 cm is charged such that the potential on its surface is 10V. What is the potential at the center of the sphere?

1. (b) Why magnetic lines of force leave and enter perpendicular to the surface?

(a) A beam of a particles projected along  $+x$ -axis, experiences a force due to a magnetic field along the  $+y$ -axis. What is the direction of the magnetic field? ( $A_{SEP}$ )



(b) Depict the trajectory of a charged particle moving with velocity  $v$  as it enters a uniform magnetic field perpendicular to the direction of its motion.

Derive an expression for the electric field at a point along an axial line outside of a short dipole

1. How does the self-inductance of a pair of coils change when

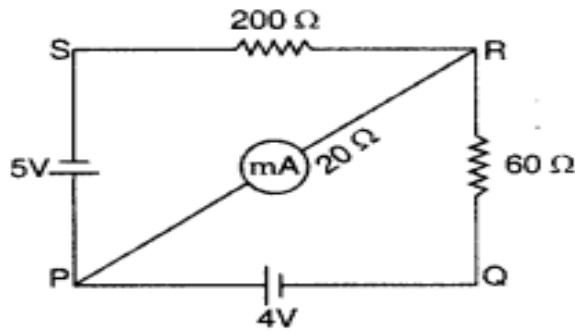
(a) The distance between the coils is increased and

(b) The number of turns in the coils is increased?

## SECTION-C

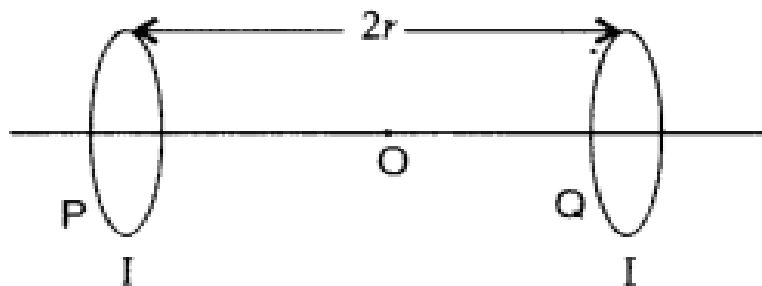
Two charges  $q_1$  and  $q_2$  are placed at  $2L$  distance apart from each other. What is the potential due to its axial line?

1. Using Ampere's circuital law, obtain an expression for the magnetic field along the axis of a current carrying solenoid of length  $l$  and having  $N$  number of turns.
2. Determine the value of current in millimeter of the network shown in figure Below:



How can you convert Galvanometer into ammeter? Explain by drawing the required circuit diagrams.

1. Two identical circular loops, P and Q, each of radius  $r$  and carrying equal currents are kept in the parallel planes having a common axis passing through O. The direction of current in P is clockwise and in Q is anti-clockwise as seen from O which is equidistant from the loops P and Q. Find the magnitude of the net magnetic field at O. (Delhi 2011)



**OR**

State Biot – Savart law in vector form expressing the magnetic field due to an

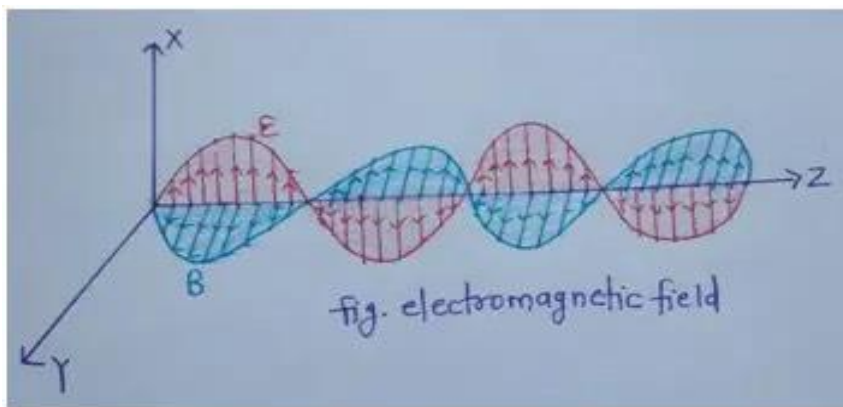
- Element       carrying current  $I$  at a distance       from the element.

27. State Faraday's laws of electromagnetic induction.

28. A metallic rod of 'L' length is rotated with angular frequency of ' $\omega$ ' with one end hinged at the center and the other end at the circumference of a circular metallic ring of radius L, about an axis passing through the center and perpendicular to the plane of the ring. A constant and uniform magnetic field B parallel to the axis is presents everywhere. Deduce the expression for the emf between the center and the metallic ring.

### SECTION -D

29. According to Maxwell's electromagnetic equations it has been proved that electric and magnetic field vectors are perpendicular to each other and also perpendicular to the direction of propagation as shown in the figure below. If  $E_x$  is the electric field along X axis, then  $B_y$  will be the direction of magnetic field along y axis and both which are perpendiculars to the z axis showing direction of propagation. The light waves are also the electromagnetic waves and may travels through vacuum also. So, we can find the velocity of a light traveling through the material medium having permittivity  $\epsilon$  and magnetic permeability  $\mu$  as  $V = 1/\sqrt{\epsilon\mu}$



In his way, we proved that velocity of light also depends on the electrical and magnetic properties of that medium through which it is traveling. The velocity of light which is constant everywhere is having value as  $3 \times 10^8 \text{ m/s}$ . The most technological importance of electromagnetic waves is that they are having strong capacity to take energy from one place to another place. The best examples are radio waves, TV signals which also carry energy from their broadcasting stations. Also, life is possible on the earth only because of the sunlight coming from the sun to the earths which also carry energy and it is nothing but the electromagnetic waves. Due to which electromagnetic waves are considered as the transverse waves.

Q 1. The ratio of relative permittivity of the medium to the permittivity of vacuum is called as\_\_\_\_\_.

- a) Permeability
- b) Permittivity of free space
- c) Dielectric constant of the medium
- d) Electric intensity

Q 2. Who showed that electromagnetic waves can be polarised?

- a) Maxwell
- b) Hertz
- c) Ampere
- d) Michelson and Morley

Q 3. The pressure exerted by the electromagnetic waves is called as

- a) Light pressure
- b) electric pressure
- c) Magnetic pressure
- d) radiation pressure

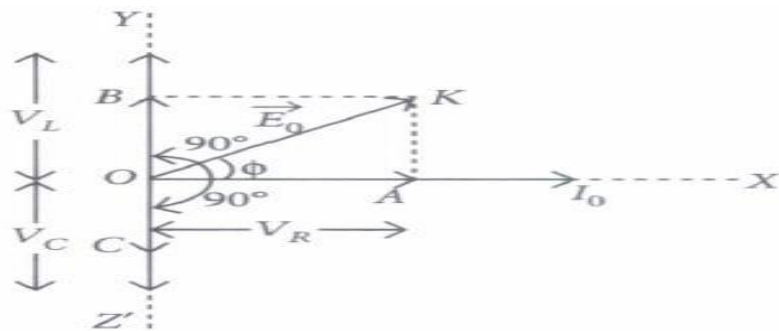
Q 4. What is the relationship between magnitude of magnetic field and electric field in case of electromagnetic waves from the Maxwell's equations?

OR

Q 5.) What is mean by the permittivity and permeability of the medium?

30. When a pure resistance R, pure inductor L and an ideal capacitor of capacitance C is connected in series to a source of alternating e.m.f., then current at any instant through the three elements has the same amplitude and is represented as  $I = I_0 \sin \omega t$ . However, voltage across each element has a different phase relationship with the current as shown in graph.

The effective resistance of RLC circuit is called impedance (Z) of the circuit and the voltage leads the current by a phase angle  $\phi$ .



A resistor of  $12\Omega$ , a capacitor of reactance  $14\Omega$  and a pure inductor of inductance  $0.1\text{ H}$  are joined in series and placed across  $200\text{ V}$ ,  $50\text{ Hz}$  a.c. supply

- (i) The value of inductive reactance is
- (ii) The value of impedance is
- (iii) What is the value of current in the circuit?
- (iv) What is the value of the phase angle between current and voltage?

## SECTION-E

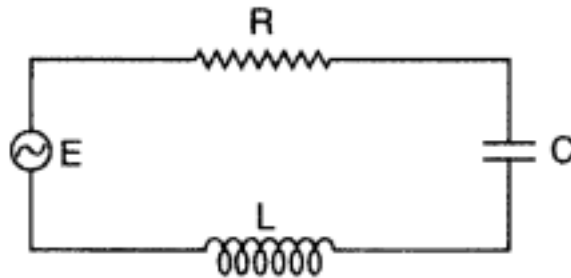
**31. (i)** Derive the expression for force per unit length between two long straight parallel current carrying conductors. Hence define one ampere.

(ii) Find the magnetic field at a point on the axis of a circular coil carrying current and hence find the magnetic field at the center of the circular coil carrying current.

The figure shows a series LCR circuit connected to a variable frequency 200 V source with  $L = 50 \text{ mH}$ ,  $C = 80 \text{ }\mu\text{F}$  and  $R = 40 \text{ }\Omega$ .

Determine

- (i) the source frequency which derives the circuit in resonance;
- (ii) the quality factor ( $Q$ ) of the circuit.



1. A Derive an expression for the force per unit length between two infinitely long

Straight parallel current carrying wires hence define one ampere.

Two parallel very long straight wires carrying a current of 5A each are kept at a separation of 1m. If the currents are in the same direction, What will be the force per unit length (in N/m) between them?

**ST. PBN PUBLIC SCHOOL**  
**HALF YEARLY EXAMINATION**  
**CLASS-XII**  
**ENGLISH**  
**(SAMPLE PAPER)**

**TIME – 3 HRS.**

**MM. 80**

**GENERAL INSTRUCTIONS:**

- 1. All questions are compulsory.**
- 2. Adhere to the prescribed word limit.**

**SECTION – A (READING)**

**(22 Marks)**

**Q1. Read the passage given below. 12M**

1. The art of living is learnt easily by those who are positive and optimistic. From humble and simple people to great leaders in history, science or literature, we can learn a lot about the art of living, by having a peep into their lives. The daily routines of these great men and women not only reveal their different, may be unique lifestyles but also help us learn certain habits and practices they followed. Here are some; read, enjoy and follow in their footsteps as it suits you.

2. A private workplace always helps. Jane Austen asked that a certain squeaky hinge should never be oiled so that she always had a warning whenever someone was approaching the room where she wrote. William Faulkner, lacking a lock on his study door, detached the doorknob and brought it into the room with him. Mark Twain's family knew better than to breach his study door-they would blow a horn to draw him out. Graham Green went even further, renting a secret office; only his wife knew the address and the telephone number. After all, every one of us needs a workplace where we can work on our creation uninterruptedly. Equally we need our private space too!

3. A daily walk has always been a source of inspiration. For many artists, a regular stroll was essentially a creative inspiration. Charles Dickens famously took three hour walks every afternoon, and what he observed on them fed directly into his writing. Tchaikovsky made do with a two-hour jaunt but wouldn't return a moment early; convinced that doing so would make him ill. Ludwig van Beethoven took lengthy strolls after lunch, carrying a pencil and paper with him in case inspiration struck. Nineteenth century composer Erik Satie did the same on his long hikes from Paris to the working-class suburb where he lived, stopping under street lamps to jot down ideas that came on his journey; it's rumoured that when those lamps were turned off during the war years, his music declined too. Many great people had limited social life too. One of Simone de Beauvoir's close friends puts it this way. "There were no receptions, parties. It was an uncluttered kind of life, a simplicity deliberately constructed so that she could do her work." To Pablo the idea of Sunday was an 'at home day'.

4. The routines of these thinkers are difficult. Perhaps it is because they are so unattainable. The very idea that you can organise your time as you like is out of reach for



most of us, so I'll close with a toast to all those who worked with difficulties. Like Francine Prose, who began writing when the school bus picked up her children and stopped when it brought them back; or T.S. Eliot, who found it much easier to write once he had a day job in a bank than he had as a starving poet and even F. Scott Fitzgerald, whose early books were written in his strict schedule as a young military officer. Those days were not as interesting as the nights in Paris that came later, but they were much more productive—and no doubt easier on his liver.

5. Being forced to follow someone else's routine may irritate, but it makes it easier to stay on the path. Whenever we break that trail ourselves or take an easy path of least resistance, perhaps what's most important is that we keep walking.

**Based on your understanding of the passage, answer the following questions.**

(i) If the writer was forced to follow someone else's routine, they would feel \_\_\_\_\_.

- (a) furious
- (b) annoyed
- (c) humored
- (d) indifferent

(ii) Why did Jane Austen believe that a certain squeaky hinge should never be oiled?

(iii) Select the option that suitably completes the given dialogue as per the context of the Passage.

X. I don't think I can ever be a great writer like William Faulkner.

Y. Why do you think like this? ...

(1)....

X. No, I don't have weird habits and quirks like him.

Y.

(2)... you just have to give it a try.

(a) (1) Of course, you can be a good writer like him

(2) That is true. But what can you do

(b) (1) You can be better than him

(2) Yeah, he was a special one

(c) (1) But, I can see that you are right

(2) Yeah, you don't have any special mannerism

(d) (1) Sure, you can be a great writer like him.

(2) That doesn't really matter

(iv) According to the passage, why did Erik Satie's music decline?

(v) During which time did Fitzgerald write the most productively?

(vi) What is the relationship between (1) and (2)?

(1) The people who are hopeful and have a positive outlook in life can easily learn the art of living.

- (2) A lot can be learnt about a person by looking into their lives.
- (a) (2) is the cause for (1)
  - (b) (1) and (2) are independent
  - (c) (2) elaborates the problem described in (1)
  - (d) (2) sets the stage for (1)

(vii) According to the passage, why did some artists resort to walking?

- (a) It is an exercise
- (b) It was a creative inspiration
- (c) It is essential for improving their health
- (d) It was helpful in interaction with others

(viii) “Those days were not as interesting as the nights in Paris that came later..” Which days are referred to in this line?

(ix) Which quote best summaries the writer’s feelings toward the artists mentioned in the passage?

- (a) Life beats down and crushes the soul and art reminds you that you have one – Stella Adler
- (b) There is no must in art because art is free–Wassily Kandinsky
- (c) Art washed away from the soul the dust of everyday life – Pablo Picasso
- (d) None of the above

(x) Select the option that lists what we can conclude from the text.

1. All the artists have already learnt the art of living.
2. If one is hopeful and sanguine, one can learn the art of living.
3. One should never follow in anyone else’s footsteps.
4. By going on frequent walks, one can become a great artist.
5. Forcing a person to follow someone else’s routine can be irritating.

- (a) 2, 3 and 5
- (b) 2 and 5
- (c) 1, 2 and 4
- (d) 1, 3 and 5

**Q2. Read the passage carefully and answer the following. 10M**

1. In recent years, there has been a surge in both group and solo travel among young adults in India. A survey conducted among young adults aged 18-25 aimed to explore the reasons behind their travel preferences and recorded the percentage variation for 10 common points that influence travel choices.

2. Among those who prefer solo travel, the most common reason cited was the desire for independence and freedom (58%), followed closely by the opportunity for introspection and self-discovery (52%). Additionally, solo travellers appreciated the ability to customize their itinerary to their preferences (44%) and the chance to meet new people on their own terms (36%).

3. On the other hand, those who prefer group travel often cited the desire for socializing and making new friends (61%) as their primary reason. Group travel also provided a sense of security and safety in unfamiliar places (52%) and allowed for shared experiences and memories with others (48%). Additionally, group travellers enjoyed the convenience of having pre-planned itineraries and organized transportation (38%).

4. Interestingly, both groups had similar levels of interest in exploring new cultures and trying new experiences (40% for solo travellers, 36% for group travellers). Similarly, both groups valued the opportunity to relax and escape from the stresses of everyday life (36% for solo travellers, 32% for group travellers).

5. However, there were also some notable differences between the two groups. For example, solo travellers placed a higher priority on budget-friendly travel options (38%) compared to group travellers (24%). Conversely, group travellers were more likely to prioritize luxury and comfort during their travels (28%) compared to solo travellers (12%).

6. Overall, the survey results suggest that both group and solo travel have their own unique advantages and appeal to different individuals, based on their preferences and priorities.

**Answer the following questions, based on given passage.**

i. Infer two possible ways that the survey, mentioned in paragraph (1) could be beneficial. Answer in about 40 words. 2

ii. Which travel choice point of the survey would influence tour operators to incorporate group dinners, social events, and shared accommodations in their itinerary? 1

- A. Freedom to customize itinerary
- B. Luxury and comfort
- C. Security and safety
- D. Desire for making new friends

iii. What do the top choices in the survey, for traveling solo and in a group suggest about young adults? 1

iv. Identify the solo traveller from the following three travellers: 1

- (a) Reshma- I don't want to keep hunting for rickshaws or taxis. A pre-booked vehicle is perfect.
- (b) Nawaz-I'm happy sharing a room in a hostel. I don't need hotel accommodation.
- (c) Deepak-I'm not worried about my well-being , even while exploring remote areas.

v. Which of the following is an example of an opportunity for self-discovery, as mentioned in paragraph 2? 1

- A. Trying new cuisine
- B. Hiring a tour guide
- C. Purchasing local artifacts
- D. Advance booking travel tickets

vi. How might the differences in budget priorities between solo and group travellers impact the types of accommodations and activities offered by the travel industry in India?

2

vii. Complete the sentence appropriately.

1

The similarities in the percentage of both solo and group travellers who are interested in exploring new cultures and trying new experiences may be due to \_\_\_\_\_.

viii. State TRUE or FALSE.

1

The title, "Wanderlust: The Solo Travel Trend among Young Adults in India", is appropriate for this passage.

## SECTION B- CREATIVE WRITING SKILLS 18M

### **Q3. Attempt ANY ONE from A and B given below. 4M**

You lost your wristwatch in your school auditorium. Write a notice in not more than 50 words for your school notice board giving a detailed description of the watch. You are Ansh/Anshika of class XII of ST. PBN Public School, Gurgaon.

OR

Your school is celebrating Grandparents' Day next week. Write a notice in 50 words to be put up on the school notice board informing students of the celebration and requesting them to be present with their grandparents. You are Samir/Suman, Head Boy/Head Girl ST. PBN Public School, Gurgaon.

### **Q4. Attempt ANY ONE from A and B given below. 4M**

Modern Public School, Delhi is organising an inter school music competition. You have decided to invite noted classical musician, Mohan Gandhi as the judge and guest of honour. Draft a formal invitation for him in 50 words. You are Neeraj/Neetu, Cultural Secretary.

OR

As the Principal of a reputed college, you have been invited to inaugurate a Book Exhibition in your neighborhood. Draft a reply to the invitation in not more than 50 words, expressing your inability to attend the function. You are Tarun/Tanvi.

### **Q5. Attempt ANY ONE from A and B given below. 5M**

You are Anita Ranjan, a resident of Karnataka. Write a letter to the editor of a local newspaper giving strong views on the disadvantages of setting up a chemical factory in your area and make an appeal to the central government to reconsider its decision, as it will worsen the environment of the city. Add your own ideas and write this letter in 120-150 words.

OR

You have realized the necessity of education and financial independence of women for their family, society and in turn for the nation. Write a letter to the Editor, 'The National Times' highlights your ideas on the importance of education of women leading to a better status for them. You are Tarun/Taruna, B-7/9, Mall Road, Delhi (100-125 words)

**Q6. Attempt ANY ONE from A and B given below. 5M**

You are Anurag/Anjali, a reporter with a national daily. You have heard that a multi storey building near the main railway station has collapsed causing panic in the area. You rush to the site of the accident along with your team. Write a report in 125-150 words mentioning the time and place of the accident, number of casualties, the cause of the accident and the rescue operation conducted by the authorities.

OR

There is a vast pool of women talent in our country. Given encouragement and opportunities, women can excel in every field. They are contributing to the nation's progress as scientists, doctors, entrepreneurs, sports persons, etc. There is no limit to what they can achieve. Write an article in 120-150 words on "Women Empowerment". You are Ramesh/Roma.

**SECTION C- LITERATURE**

**40M**

**Q7. Read the given extracts to attempt the questions with reference to context. Attempt ANY ONE of two extracts given. 1x6=6M**

1. A "No, I couldn't think of it!" he said, looking quite alarmed. He thought of the thirty kronor. To go up to the manor house would be like throwing himself voluntarily into the lion's den. He only wanted a chance to sleep here in the forge and then sneak away as inconspicuously as possible.

i. Who is thinking about the thirty kronor?

ii. Which figure of speech has been used by the author in the phrase "Lion's den"?

- (a) Personification
- (b) Metaphor
- (c) Simile
- (d) Allusion

iii. What does the word 'inconspicuous' mean here?

iv. The above passage is taken from

- (a) The Rattrap
- (b) The Enemy
- (c) The Last Lesson
- (d) Deep Water

v. Why was he alarmed?

vi. Who is the author of the given extract?

OR

Gandhi told Shukla he had an appointment in Cawnpore and was also committed to go to other parts of India. Shukla accompanied him everywhere. Then Gandhi returned to his ashram. For weeks he never left Gandhi's side.

"Fix a date," he begged.

Impressed by the sharecroppers tenacity and story Gandhi said, "I have to be in Calcutta on such-and such a date. Come and meet me and take me from there".

i. Who was Shukla?

ii. Why was Shukla following Gandhi ji?

- (a) Because he wanted to get ideas to become famous.
- (b) Because he wanted to learn from him the art of speaking.
- (c) Because he wanted to seek his guidance for his own upliftment.
- (d) Because he wanted to seek his help for the poor sharecroppers of his village.

iii. Which quality of Shukla impressed and convinced Gandhi to come with him?

- (a) His stubbornness
- (b) His perseverance
- (c) His arrogance
- (d) His indecisiveness

iv. The author of this chapter is

v. What kind of person was Shukla?

vi. What is the meaning of the word 'tenacity'?

**Q8. Attempt ANY ONE of two extracts given. 1x4=4M**

One day the boss closed down the Story Department and this was perhaps the only instance in all human history where a lawyer lost his job because the poets were asked to go home.

- A) Name the chapter and the author.
- B) Whom did the story Department comprise of?
- C) What happened when it was closed down?
- D) What was strange about the lawyer losing his job?

OR

But that's the reason, he said, and my friends all agreed. Everything points to it, they claimed. My stamp collecting, for example; that's a 'temporary refuge from reality: Well, maybe, but my grandfather didn't need any refuge from reality; things were pretty nice and peaceful in his day, from all I hear, and he started my collection. It's a nice collection too, blocks of four of practically every U.S. issue, first-day covers, and so on. President Roosevelt collected stamps too, you know.

i. Choose the option which is the correct meaning of the word 'refuge'.

1. sanctum
2. exposures
3. peril
4. haven
5. retreat
6. security

(a) 1, 2, 3, 4

(b) 1, 4, 5, 6

(c) 2, 3 and 4

(d) 2, 4, 5, 6

ii. How would you describe Charley's vision of his grandfather's life and times?

(a) Wistful escapism

(b) Idealized sentimentality

(c) Nostalgic simplicity

(d) Dreamy perfection

iii. What does the narrator use as a temporary refuge?

iv. What all was there in narrator's collection?

**Q9. Attempt ANY ONE of two extracts given. 1x6=6M**

Perhaps the Earth can teach us  
as when everything seems dead  
and later proves to be alive.

Now count up to twelve  
and you keep quiet and I will go.

i. According to the above extract, Man needs to learn from

(a) death

(b) earth

(c) stars

(d) moon

ii. Why does the poet count up to twelve?

(a) To recall the numbers

(b) To take time to calm down

(c) To calculate the twelve hours

(d) To memories the events of the last twelve days.

iii. What will keeping quiet help us to achieve?

1. Monotony

2. Intelligence

3. Peace

4. Tranquility

5. Vigour

(a) 1 and 2

(c) 2 and 5

(b) 3 and 4

(d) 1 and 4

iv. This poem is written in\_\_\_\_\_.

(a) ballad form

(c) free verse

(b) blank verse

(d) the form of sonnet

v. What does the earth teach us?

vi. What is the significance of ‘Keeping Quiet’?

OR

...that she was as old as she

Looked but soon

Put that thought away, and

Looked out at young trees,

Sprinting, the merry children spilling out of their homes.

i. What is the tone of the poet in the above lines?

1. Sentimental

2. Sarcastic

3. Ironical

4. Aggressive

5. Tolerant

Choose the most appropriate option.

(a) Only 1.

(c) 1, 4 and 5

(b) 2 and 3

(d) Only 3

ii. Identify the phrase from the extract that suggests the following.

The poetess realized that her mother was old now.

iii. Which phase of life is quiet happy and full of energy?

(a) The phase of life in which poet's mother lies.

(b) The phase of life in which sprinting trees lie.

(c) The phase of life in which merry children spilling out of their homes.

(d) The phase of life in which poet lies.

iv. Complete the following analogy correctly.

Poetess: frightened: children: \_\_\_\_\_.



v. On the basis of the extract, choose the correct option with reference to (1) and (2) statements given below.

1. The parting words suggest the optimism of the poetess.
2. They console the mother that she would return soon and give her a hope of survival.

- (a) 1 is true but 2 is false.                      (b) 2 is true but 1 is false.  
(c) 2 can be inferred from 1.                      (d) 2 is the reason of 1

vi. Fill in the blank with appropriate words, with reference to the extract.

The poetess noticed young children playing outside; the young trees moving rapidly in the opposite direction of the moving car. These represent energy and youth in contrast to the \_\_\_\_\_.

**Q10. Answer ANY FIVE of the following in about 40-50 words each. 2x5=10M**

- i. When do the residents of Alsace realise how precious their language is to them?
- ii. Why was the crofter so talkative and friendly with the peddler?
- iii. Imagery was an effective literary device to bring out the contrast between the merry children and the mother. Comment.
- iv. Why do most celebrity writers despise being interviewed?
- v. Mention the hazard of working in the glass bangle industry.
- vi. Why does the story of Subbu's success in the film industry reveal about the importance of loyalty, creativity and versatility in this field?

**Q11. Answer ANY TWO of the following in about 40-50 words each. 2x2=4M**

- i. What made the chief astrologer place his finger on his nose?
- ii. What extraordinary experience did Charley have when he went to the Grand Central Station?
- iii. What indicates that Dr. Sadao's father was a very traditional and conventional man?

**Q12. Answer ANY ONE of the following in about 120-150 words. 1x5 =5M**

i. In the story, 'The Third Level' by Jack Finney, Charley is obsessed with finding the third level. In an attempt to thrash out whether this obsession is a good quality or a harmful one, Charley's wife expresses her thoughts in a diary entry. As Louisa, Charley's wife, write this diary entry. Support your response with reference to the story.

You may begin this way:

I have been married to Charley for a few years now and I have always known him to be an intelligent man with an imaginative mind. However, his recent obsession with finding the Third Level has...

**OR**

ii. How did the Tiger King stand in danger of losing his Kingdom? How was he able to avert the danger?

]

**Q13. Answer ANY ONE of the following in about 120-150 words. 1x5=5M**

i. Moved by Anees Jung's account of the ragpicker's plight, you decide to write an article for your school magazine. In the article write the different values that society needs to inculcate to help these people loosen the grip of their pathetic circumstances. Draft the article in about 150 words.

**OR**

ii. In the story 'The Rattrap', both Edla and the old crofter offer the peddler hospitality, but it is Edla's treatment that changes him. State the reasons for why Edla was able to bring about a change in him.

**ST. PBN PUBLIC SCHOOL  
HALF YEARLY EXAMINATION  
CLASS -XII  
PHYSICAL EDUCATION  
SAMPLE PAPER**

**Time: 3 Hours**

**MM: 70**

**GENERAL INSTRUCTIONS:**

- 1. The question paper consists of 5 sections and 37 Questions.**
- 2. Section A consists of questions 1-18 carrying 1 mark each and are multiple choice questions. All questions are compulsory.**
- 3. Sections B consists of questions 19-24 carrying 2 marks each and are very short answer types and should not exceed 60-90 words. Attempt any 5.**
- 4. Sections C consists of questions 25-30 carrying 3 marks each and are short answer types and should not exceed 100-150 words. Attempt any 5.**
- 5. Sections D consists of questions 31-33 carrying 4 marks each and are case studies. There is internal choice available.**
- 6. Section E consists of question 34-37 carrying 5 marks each and are long answer types and should not exceed 200-300 words. Attempt any 3.**

**SECTION A**

1. Logistics committee deals with:  
(a) Accommodation (c) Medical Staff  
(b) Transportation (d) All of the above
2. The total number of matches in a knockout tournament of 34 teams are:  
(a) 31 (c) 33  
(b) 32 (d) 35
3. Posture is an index of:  
(a) Personality (c) Character  
(b) Health (d) Fitness
4. Makarasana is beneficial for:  
(a) Diabetes (c) Obesity  
(b) Hypertension (d) None of these
5. The normal adult person should have a blood pressure:  
(a) 80/120 (c) 100/140  
(b) 60/130 (d) 40/120
6. How many countries are involved in the Special Olympic Association ?

(a)204

(c)104

(b)200

(d)172

7. Lordosis is a problem of the

(a) Lower back

( c) Upper back

(b) Middle back

(d) Shoulders

8. Bhujangasana is also called as:

(a) Cobra pose

( c) Peacock pose

(b) Tiger pose

(d) Cow pose

9. The founder of Special Olympics was:

(a) Eunice Kemmedy Shriver

( c) Lyndom B. Johnson

(b) John F. Trumph

(d) Donald Trumph

10. Sugar, sweets and bread are rich sources of

(a) Carbohydrates

( c) Proteins

(b) Fats

(d) Roughage

11. Push ups(Boys) measure:

(a) upper body strength and endurance

( c) Both (a) as well as (b)

(b) Trunk stability

(d) None of these.

12. 50m standing start helps in measuring:

(a) Balance

( c) Endurance

(b) Speed

(d) Agility

13. Which test is to be conducted to measure agility?

(a) Standing board jump

( c) Partial curl up

(b) 4X10 shuttle run

(d) Push ups

14. Vital capacity depends upon

(a) Lung size

( c) chest cavity size

(b) strength of respiratory muscles

(d) all of these.

15. A bone fracture is an example of injury to

(a) skin

( c) Hard tissue

(b) soft tissue

(d) Eyes

16. Overstretching of ligaments causes:

(a) Sprain

( c) Contusion

(b) Strain

(d) Bruises

17. Given below are the two statements labeled Assertion (A) and Reason (R)

**Assertion(A):** Planning is the foremost function in sports.

**Reason (R):** Planning gives a view of future course of action.

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 and (R) is not correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

18. Given below are the two statements labeled Assertion (A) and Reason (R)

**Assertion(A):** Balance diet is the diet which contains all the essentials nutrients in adequate quantity and proportion.

**Reason (R):** Requirement of food depends upon age, type of work ,etc.

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 and (R) is not correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

#### SECTION B

- 19. Explain about knockout tournament with an example.
- 20. Briefly explain about vitamins.
- 21. Explain about asthma.
- 22. Discuss about cognitive disability.
- 23. Briefly discuss flatfoot.
- 24. Explain 600m Run/Walk in brief.

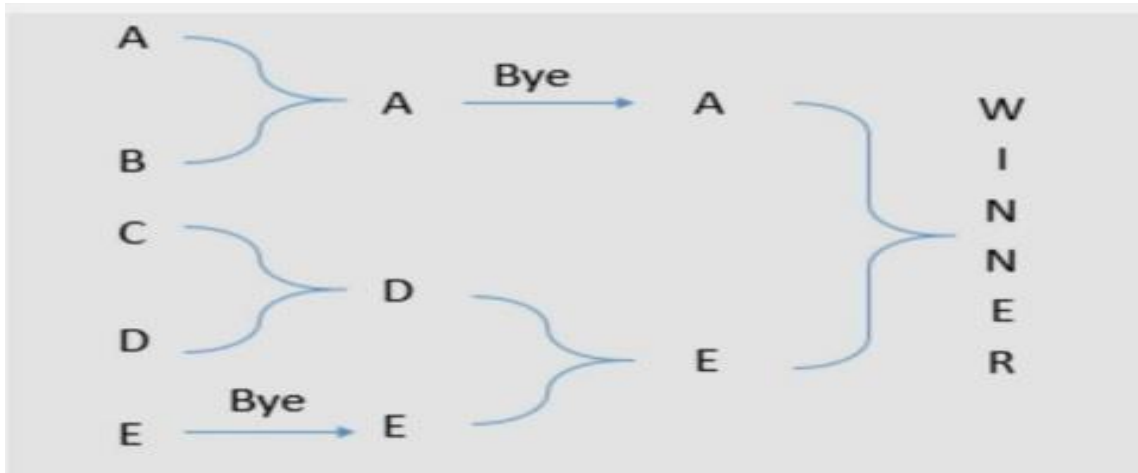
#### SECTION C

- 25. Draw a fixture of 13 teams on knock-out basis.
- 26. Describe any two of the female triad.
- 27. Discuss the contraindications of Dhanurasana.
- 28. Write a detailed note on macro-nutrients in our diet?
- 29. Briefly mention the benefits of Tadasana.
- 30. Explain the procedure of Chair sit-and-Reach Test.

#### SECTION D

31. Case based question:

Competing in physical activities has been the natural tendency of humans. The competitions or tournaments are held according to the set rules and regulations. The success of the tournament depends upon suitable fixture. Observe the below given fixture and answer the questions.



- (i). The method followed in drawing the fixture is \_\_\_\_\_
- (ii). Number of matches played can be calculated by the formula \_\_\_\_\_
- (iii). The advantage of this tournament is \_\_\_\_\_
- (iv). In this type of tournament, a team once defeated gets \_\_\_\_\_

32. Case based question:

ABC School is one of the reputed schools in their location for the number of sports facilities it provides to its stake holders. Keeping that in consideration CBSE Sports cell has given them the responsibility of conducting CBSE Football cluster. 35 teams have sent their entry for participation in the tournament.

- (i). Due to large number of teams willing to participate, the school is conducting the competition by \_\_\_\_\_ fixture.
- (ii). The number of Matches in the first round will be \_\_\_\_\_
- (iii). Total number of rounds will be \_\_\_\_\_
- (iv). Total number of matches will be \_\_\_\_\_

33. Case based question:

Mr. Lakshman, aged 65 years worked as a civil engineer in a construction company. He had to walk and climb a lot as part of his job. After retirement, he settled with his son spending time with his grandchildren. Now a days he is experiencing difficulty in doing certain chores which involves physical movement.

- (i). How many series of tests are there in the prescribed fitness test for Mr. Lakshman?
- (ii). Chair sit & reach test is done to check.....
- (iii). The 8 foot up & go test, as shown in the picture is performed to assess \_\_\_\_\_
- (iv). Which test would you recommend to check Mr. Lakshman's fitness?

SECTION E

34. Write about the various committees and their responsibilities.
35. What do you mean by Back pain? Discuss the procedure and benefits of Shalabhasana.
36. Discuss the advantages of physical activities for children with special needs in detail.
37. Explain the physiological factors determining speed.