

SUBJECT : ENGLISH (SET-I)**Time : 3 Hrs.****M.M.: 80****General Instructions :**

1. *All questions are compulsory.*
2. *You may attempt any section at a time.*
3. *All questions of that particular section must be attempted in the correct order.*
4. *Avoid cutting and overwriting.*

SECTION-A (READING)

Q1. Read the following passage carefully and answer the questions given below : (12 marks)

- (1) Morpheus says in the Matrix : "There's a difference between knowing the path, and walking the path." Life is not easy, packed as it is with challenges. And in the process of living, we feverishly pursue success, joy and happiness, believing in our hearts that they are interlinked, that one leads to the other in a smooth flow. But it's a mirage that constantly eludes us.
- (2) Joy is often misunderstood; it is also easily forgotten. Yet, the optimum quality of life as we recognise it is realised through moments of joy. Joy is the ultimate, but to experience it, you have to be yourself. The lightness of joy is like a feather, free falling in the wind and slipping through your fingers. Joy is internal, experienced through a culmination of perfect alignment, rhythm and timing of the self. This near-perfect synchronisation leading to joy in its purest form is known the 'sweet spot'.
- (3) There is joy in any activity that leads to personal growth and excellence. It calls for enthusiasm (entheos, the God in you) that disregards success and failures. When you realise your sweet spot and know what you want, pursue it with a single-mindedness to the exclusion of all else.
- (4) The sweet spot is what drives you. In every game, the player needs to align his mind, body and spirit. He cannot afford to let his attention waver. The road to excellence is paved with joy. But the path can get clouded over by lethargy, lack of courage, fear of failure and insecurities. These invisible enemies are demons of the mind. Self-created, these demons break down the alignment of mind, body and spirit. It is crucial to recognise and then obliterate them from the mind. Use every cell in your body and brain to hit that personal sweet spot of joy. Joy is internal whereas success is a creation of society.
- (5) Many a lifetime is spent in frustration, because most equate success with joy. Mere fame and money do not bring joy. Joy emanates from our own actions, from what one feels deep down inside. Success is a social concept measured by fame, money and power — don't fall

into the trap. Success is said to be the consequence of certain actions. A result called success is termed 'pure action' by Swami Parthasarathy in *The Vedanta Treatise*. Pure action has three qualities, concentration, consistency and cooperative endeavour. Concentration is defined as the intellect supervising the mind to remain in the present. The mind has to be continuously supervised as it travels back and forth — to the past and future — with equal velocity. An unleashed mind can cause self-destruction. An unwavering mind is the ultimate power of concentration.

(I) Choose the most appropriate options out of the following : (1x4=4)

(a) Life is packed with _____.

- (i) struggle (ii) difficulties
(iii) challenges (iv) problems

(b) Human beings madly run after _____.

- (i) success and joy (ii) riches and happiness
(iii) success, joy and happiness (iv) material things

(c) Joy is experienced through a culmination of _____.

- (i) perfect alignment (ii) timing of the self
(iii) rhythm (iv) all these three

(d) Noun form of the word 'pure' is _____.

- (i) pureness (ii) pure
(iii) purity (iv) purification

(II) Answer the given questions in short : (1x6=6)

(e) What is the wrong conception in our mind?

(f) How can we experience joy?

(g) What is essential to realise joy in life?

(h) Who are the invisible enemies?

(i) What do these invisible enemies do?

(j) How can we realise the 'sweet spot' in ourselves?

(III) Find words from the passage which mean the same as : (1x2=2)

(k) reaching a climax (para 2)

(l) eliminate (para 4)

Q2. Read the following passage and answer the questions that follow : (8 marks)

(1) Disease-snobbery is only one of a great multitude on snobberies, of which now some, now others take pride of place in general esteem. For snobberies ebb and flow, their empire

rises, declines, and falls in the most approved historical manner. What were good snobberies a hundred years ago are now out of fashion. Thus, the snobbery of family is everywhere on the decline. The snobbery of culture, still strong, has now to wrestle with an organized and active low-browism, with a snobbery of ignorance and stupidity unique, so far as I know, in the whole of history. Hardly less characteristic of our age is that repulsive booze-snobbery, born of American Prohibition. The malefic influences of this snobbery are rapidly spreading all over the world. Even in France, where the existence of so many varieties of delicious wine has hitherto imposed a judicious connoisseurship and has led to the branding of mere drinking as a brutish solecism, even in France the American booze-snobbery, with its odious accompaniments—a taste for hard drinks in general and for cocktails in particular is making headway among the rich. Booze-snobbery has now made it socially permissible, and in some circles even rather creditable, for well-brought-up men and (this is the novelty) well-brought-up women of all ages, from fifteen to seventy, to be seen drunk, if not in public, at least in the very much tempered privacy of a party.

2. Modernity-snobbery, though not exclusive to our age, has come to assume an unprecedented importance. The reasons for this are simple and of a strictly economic character. Thanks to modern machinery, production is outrunning consumption. Organized waste among consumers is the first condition of our industrial prosperity. The sooner a consumer throws away the object he has brought and buys another, the better for the producer. At the same time, of course, the producer must do his bit by producing nothing but the most perishable articles. 'The man who builds a skyscraper to last for more than forty years is a traitor to the building trade'. The words are those of a great American contractor. Substitute motor car, boot, suit of clothes, etc. for skyscraper, and one year, three months, six months and so on for forty years, and you have a gospel of any leader of any modern industry. The modernity-snob, it is obvious, is this industrialist's best friend, for modernity-snobs naturally tend to throw away their old possessions and buy new ones at a greater rate than those who are not modernity-snobs. Therefore, it is in the producer's interest to encourage modernity-snobbery. Which in fact he does do—on an enormous scale to the tune of millions and millions a year—by means of advertising. The newspapers do their best to help those who help them; and to the flood of advertisement is added a flood of less directly paid-for propaganda in favour of modernity-snobbery. The public is taught that up-to-dateness is one of the first duties of man. Docile, it accepts the reiterated suggestion. We are all modernity-snobs now.
3. Most of us are also art-snobs. There are two varieties of art-snobbery—the Platonic and the unplatonic. Platonic art snobs merely 'take an interest' in art. Unplatonic art-snobs go further and actually buy art. Plantonic art-snobbery is a branch of culture-snobbery. Unplantonic art-snobbery is a hybrid from parents of difference or mule, for it is simultaneously a sub-species of culture-snobbery and of possession-snobbery.

- (I) On the basis of your reading of the above passage make notes on it, in points only, using headings and sub-headings. Also use recognizable abbreviations, wherever necessary (minimum 4). Supply a suitable title to it. (5)
- (II) Write a summary of the above passage, using notes in about 80 words. (3)

SECTION-B (ADVANCED WRITING SKILLS)

- Q3. As Karan/Kripa, the manager of a shopping mall, you need shopping assistants (both male and female). Draft a classified advertisement for a local daily. (4)

OR

The Annual Sports Meet of St. Joseph Convent School, Faridabad is planned to be held on 2 March, 2017. Draft an invitation on behalf of the Principal in not more than 50 words.

- Q4. As manager of an art emporium, write a letter to the manager, Best Security System, Chandigarh, complaining against the faults in CCTV cameras installed by the company. You are Raman/Deepa, Moments Art Emporium, 250 Sector-44, Chandigarh. (6)

OR

Write an application in response to the following advertisement that appeared in The Tribune, New Delhi. You are Ashutosh/Reema of 41-C, Sector-18, Rohini, Delhi.

Wanted for a well-known hotel an experienced chef. North Indian food, degree essential, higher start for deserving candidates. Contact : Manager, Hotel Imperial, Sector-17C, Rohini, Delhi.

- Q5. Today the 24-hour television news channels give us instant news from every nook and corner of the world, and yet the relevance of newspaper has not decreased. Write an article on 'The Relevance of Newspaper', as Sunidhi/Suresh. (10)

OR

Arya International School, Delhi organised its annual fete on 10 January, 2017. You have been asked to write a report about it for the school magazine. You are Ajit/Ajeeta, Head Boy/Head Girl of the school.

SECTION-C (TEXT BOOKS AND LONG READING TEXT)

- Q6. Read the given extract and answer the questions that follow :

A sweet face,

My mother's, that was before I was born.

And the sea, which appears to have changed less,

Washed their terribly transient feet.

- (a) What is the photograph has not changed? (1)
- (b) When was the photograph taken? (1)

(c) Explain - 'terribly transient feet'. (2)

OR

We speak like strangers, there's no sign
Of understanding in the air.
This child is built to my design
Yet what he loves I cannot share.

(a) What does the speaker regret? (1)

(b) Why do father and son behave as strangers? (1)

(c) What is peculiar about the relationship between father and son? (2)

Q7. Answer any FOUR of the following in 30-40 words each : (3x4=12)

(a) Describe the person whose portrait hung above the mantelpiece.

(b) Why was Tut buried along with gilded treasures?

(c) Who are the beneficiaries of rain?

(d) "Every family has a crazy streak in it somewhere". Why does the narrator say so?

(e) What reason was given by the head teacher for his decision of expelling Albert from school?

(f) What was so funny about the advice of the 'wisest' man?

Q8. Answer the following in 120-150 words : (6)

Elaborate on the views of Mr. Lester R. Brown as given in the chapter 'The Ailing Planet.....'

OR

How did the narrator prove to be the best captain? ('We're not afraid to Die')

Q9. Answer the following in 120-150 words : (6)

The story writer brings a change in Ranga's character. When does the change come to light?

OR

Mrs. Pearson is a symbol of exploited womanhood. Comment with reference to the play.

Q10. Sir Simon received a splendid farewell. Describe the funeral procession. (120-150 words). (6)

Q11. 'The Ghost is the central figure in the novel'. Attempt a character sketch of the Ghost of Canterville, on the basis of your reading of the novel. (120-150 words). (6)

TERM II EXAMINATION
CLASS- XI
INFORMATICS PRACTICES

TIME: 3HOURS

MM: 70

GENERAL INSTRUCTIONS:

- All the questions are compulsory.
- Answer the questions after carefully reading the text.
- Programming language – JAVA
- Relational Database - MySQL

- Q1 : (a) Explain any two input devices? [2]
(b) Define CPU and its parts. Draw CPU diagram. [2]
(c) What is a Trojan Horse? How can it affect a computer system? [2]
(d) What do you mean by BIOS? [2]
(e) Differentiate between Compiler and Interpreter. [2]

- Q2. a. Jennie is not clear about the difference between the following two statements: [1]
i. `SELECT (9+5) * 5;`
ii. `SELECT (9+5) *5 FROM CUST;`
Help her to understand the difference between these two statements.

- b. What is the purpose of "order by" clause in MYSQL? [2]
c. Rishu has created table with 12 rows and 9 columns. After testing he added 3 rows and deleted 4 columns. What is the degree and cardinality of the table. [2]
d. Write the output of the following queries: [2]
(i) `SELECT ROUND(6666.666,-1);`
(ii) `SELECT MONTHOFYEAR ("2016-03-01");`
(iii) `SELECT POW(10,2)+ SQRT (16) ;`
(iv) `SELECT INSTR ('RED SCHOOL JHABAR', 'A');`
e. What is the purpose of column alias? Explain with an example. [2]
f. Write MySQL command to create a new database "CPU"? [1]

- Q3: a. While working with Netbeans, Mohan included a Listbox control which contains student subject. Which method is used to get selected subject. [1]

b. What is the use of if statement in JAVA.

c. Name two data types of JAVA that are used to store non fraction values. Explain with an Example. [2]

d. Explain logical errors with an example. [1]

e. Differentiate between JComboBox and JListbox. [2]

f. Write java code that takes value for principle amount , rate of interest and time from jTextField1, jTextField2 and jTextField3 and calculate simple interest and display in jTextField4.
(simple interest= $p * r * t / 100$).

g. What is the use of Documentation? [2]

- Q4. (a) Write java code to print odd numbers from 1 to 20 using For loop [1]
1,3,5.....

(b) Rewrite the following using 'do ...while loop' and check how many times will the following loop get executed.

`Int s=0;` [2]

```
for( int i=0 ; i<=55; i+=5)
    s+=i;
```

(c) Distinguish between '/' and '%' operators.

[1]

(d) Find the errors in the following code and underlined the corrections made:

```
int a,b==20;
```

[2]

```
do
```

```
{
```

```
a=b*2;
```

```
b=a/b
```

```
while b>40};
```

(e) Rewrite the code using if statement:

[2]

```
switch(k)
```

```
case 1:Day="Monday";
```

```
break;
```

```
case 2:Day=" Tuesday";
```

```
break;
```

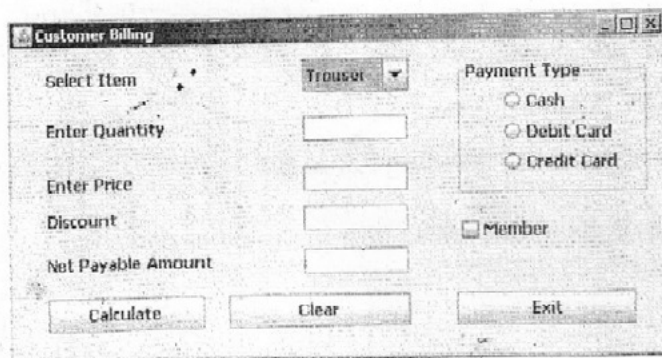
```
case 3:Day=" Wednesday";
```

```
break;
```

```
default: Day="-";
```

(f) Ms. Shelly works in a shopping mall. To calculate net payable amount, she has developed the following GUI in NetBeans.

[2]



The shop accepts payments in three modes- Cash, Debit Card, Credit Cards. The discount given as per mode of payment is as follows. If the Member check box is checked then the customer gets an additional discount of 3% on net payable amount.

<u>Mode of Payment</u>	<u>Discount</u>
Cash	15%
Debit Card	10%
Credit Card	Nil

- i) Write the code to make the textfields for Discount(txtDiscount) and Net Payable (txtNetPayable) uneditable. [1]
- ii) When Calculate button is clicked the discount and net payable amount is calculated as per the given criteria and displayed in discount and net payable text boxes. [4]
- iii) When Clear button is clicked all the text boxes and checkbox should be clear. [1]
- iv) Close the application when Exit button is pressed. [1]
- Q5(a). Write SQL commands for the queries (i) to (viii) based on a table EShop [8]

RELATION : EShop

Code	Names	Company	Qty	City	Price
101	Maggi	Kissan	20	Rajkot	70.00
102	Biscuit	Pule	70	Mehsana	100.00
105	Jam	Maggi	60	Ahmedabad	95.00
109	Sauce	Nestle	50	Rajkot	86.00
110	Chocolate	Cadbury	53	Mehsana	209.00
107	Cake	Hide & Seek	20	Junagadh	380.00

- (i) To display names of the items whose name ends with 'e' in ascending order of price.
- (ii) To display code, item name and city of the items whose quantity is less than 100.
- (iii) To display all items whose price value between 100 to 250.
- (iv) To increase the price by 10% of all items.
- (v) Add following record to the table.
11, Pizza, Nestle,40,Rajkot,175.00
- (vi) To add one more column totalprice with numeric(10).
- (vii) To remove cadbury items from the table.
- (viii) To display chocolate, jam and biscuit .
- (b) i) Write all arithmetic operators. [1]
- ii) What is the use of Rtrim() function? [1]

Q6(a) Write MySQL command for creating a table "MEMBER" whose structure is given below:

[2]

Field Name	Data Type	Size	Constraints
Mem Number	Integer	4	Primary Key
Name	Varchar	20	
BirthDate	Date		
Fees	Integer	8	Not Null
Address	Varchar	20	
PhoneNo	Varchar	10	

- (b) Remove the whole structure Member. [1]
 (c) Write mysql command to see the structure of the table. [1]
 (d) Differentiate between char and varchar. [2]
 (e) Differentiate between now() function and sysdate() function. [2]
 (f) Write SQL statements to do the following [2]
 i) Display the number of characters in the string: "Smart phones".
 ii) Display the year of the date 2 September 2015.

- Q.7 (a) Define E- Governance? Write any two e-Governance sites. [1]
 (b) Define E- learning? Write any two e-learning sites. [2]
 (c) Rahul works for the Customer Department. He wishes to create controls on form for the following functions. Choose appropriate controls from TextBox, Label, OptionButton, ChechBox, ComboBox, CommandButton and write in the third column. [2]

S. No.	Control Used to	Control
1	Enter name	
2	Enter gender	
3	Choose Country from a list of cities	
4	Submit form	

SUBJECT : COMPUTER SCIENCE (SET-I)**Time : 3 Hrs.****M.M.: 70****General Instructions :****(i) All the questions are compulsory.****(ii) Programming language: C++**

- Q1. (a) State the basic units of the computer and give function of each of the unit. (2)
- (b) What is difference between interpreter and compiler? (2)
- (c) Convert the following : (3)
- (i) $(4536)_8$ to decimal
- (ii) $(10101101100101)_2$ to Octal
- (iii) $(63567)_8$ to Hexadecimal
- (d) Find the 8 bits two's complement form of the following decimal number. (1)
- 73
- (e) What is polymorphism? How polymorphism is implemented in C++ language? Explain with an example. (2)
- Q2. (a) Differentiate between multiprogramming and multiprocessor operating system. (2)
- (b) What are literals? Explain any two literals with an example. (2)
- (c) What are fundamental data types? How many fundamental data types exist in C++ language? Name all fundamental data types with size. (3)
- (d) Write a program to input cost price and to find discount based upon the following info. (3)

Cost price	Discount
≤ 1000	3%
$> 1000 \ \& \ \leq 5000$	5%
$> 5000 \ \& \ \leq 10000$	10%
> 10000	15%

- Q3. (a) Write a program to input any number and to find all factors of that number. (3)
- (b) What is the Object Oriented programming paradigm. Write any two advantages of OOPs. (2)
- (c) (I) What is the memory requirement for the following constants? (2)
- (i) "Meera\'s Birthday" (ii) "\?"
 (iii) '\a' (iv) "my name"
- (II) Differentiate between = and == operators. (1)
- (d) What are iterative statements? Draw flowchart of iterative statement. (2)
- Q4. (a) What are the characteristics of a good program? (2)
- (b) Predict the output of the following code fragment: (2)

```
(i) int a, b=3;
    cin>>a;
    if(a)
        b=a++ -1;
    cout<<"a="<<a<<endl;
    cout<<"b="<<++b<<endl;
```

When the value of a is input as 6.

```
(ii) cin>>a;
    if (a=5)
        cout<<"Five";
    else
        cout<<"Not Five";
```

if the input given is 7.

(2)

- (c) Observe the following C++ code and find out, which out of the given options (i) to (iv) are the expected correct output. Also assign the maximum and minimum value that can be assigned to the variable 'To'. (2)

```
void main( )
{
    int Y[4]={200,175,100,225};
    int To = random(size(int))+2;
    for (int i = To; i<4; i++)
        cout<<Y[i]<<"$$";
}
```

- (i) 200\$\$175 (ii) 175\$\$100\$\$225\$\$
(iii) 175\$\$100\$\$ (iv) 100\$\$225\$\$

- (d) Write a function FindArray(int a[], int n, int num) in C++, to pass array 'a', size 'n' and num and to check whether given number num exists in the list or not. The function should return 1 if the number exists, 0 if the number does not exist. (3)

- (e) What is RAM? (1)

- Q5. (a) Which C++ header file(s) will be essentially required to be included to run/execute the following C++ source code (Note : Do not include any header file(s), which is/are not required) : (2)

```
int main( )
{
    char T[]="Hallow", d[20];
    int n=100;
    cout<<"Result:"<<strep(y(d, T)<<endl;
    cout<<sqrt(n);
    if (isupper(T[3]))
        cout<<T;
    return(0);
}
```

(3)

(b) Write a program to input n elements (numbers) and replaces the elements having odd values with the thrice its value and the elements having even values twice its values. Display all values on the output screen also. (3)

(c) What is the difference between typedef and #define in C++. (2)

(d) Write a program to input any matrix and to interchange first row with last row. Display the resultant matrix on the output screen. (4)

input :	output :
1 2 3	7 8 9
4 5 6	4 5 6
7 8 9	1 2 3

96. (a) Define the following with an example. (3)

(i) call by value (ii) Global Variable

(iii) Explicit type conversion

(b) Rewrite the following program after removing the syntactical error(s) if any. Underline each correction. (2)

```
#include [iostream.h]
typedef char Text (80);
void main( )
{
Text T="Indian";
int Count=strlen(T);
cout<<T<<'has'<<Count<<'characters'<<endl;
}
```

(c) What will be the output of the following segment? (2)

```
#include<iostream.h>
#include<conio.h>
int a=20;
void demo (int &x, int y, int z)
```

(4)


```

    {
        a+=x;
        y*=a;
        z=a+y;
        cout<<x<<'\t'<<y<<'\t'<<z<<endl;
    }
void main( )
{
    clrscr();
    int a=15, b=5;
    demo(a, a, b);
    cout<<a<<'\t'<<a<<'\t'<<b<<endl;
}

```

- (d) Write a program to input any number and to find the factorial of that number. (2)
- Q7. (a) Write a program to input any string and to convert uppercase to lowercase and vice versa. (3)
- (b) Define a structure Sports with following descriptions: (4)

- S_code of type long
- S_Name of type character array (String)
- Fees of type integer
- Duration of type integer

Write a program to input S_code and S_name and assign fees and duration based upon the following information.

<u>S Name</u>	<u>Fees</u>	<u>Duration</u>
Table Tennis	2000	3
Swimming	4000	1
Football	3000	2

Print all information on the output screen.

(c) Find the output of the following program : (2)

```
# include <iostream.h>
# include <ctype.h>
void strcon(char s[ ])
{
for (int i=0, l=0; s[i]!='\0'; i++, l++);
for (int j=0; j<l; j++)
{
if (isupper(s[j]))
s[j]=tolower(s[j])+2;
else if (islower(s[j]))
s[j]=toupper(s[j])-2;
else
s[j]='@';
}
}
void main( )
{
char c[ ]="Romeo Juliet";
strcon(c);
cout<<"Text="<<c<<endl;
c=c+3;
cout<<"New Text="<<c<<endl;
c=c+5-2;
cout<<"last Text="<<c;
}
```

(d) Calculate size and number of elements from the following array : (1)

```
double a[40][10];
```

SUBJECT : BIOLOGY

Time : 3 hrs.

M.M. : 70

General Instructions :

- (i) There are 25 questions and 5 sections in the question paper. All questions are compulsory.
- (ii) Section-A contains question number 1 to 5, very short answer type questions of one mark each.
- (iii) Section-B contains question number 6 to 10, short answer type-I questions of 2 marks each.
- (iv) Section-C contains question number 11 to 20, short answer type-II questions of 3 marks each.
- (v) Section-D contains question number 21 to 23, long answer type questions of 5 marks each.
- (vi) Section-E contains question number 24 to 25 based on Open Text Material provided by CBSE. Each question carries 5 marks
- (vii) There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks and all three questions of 5 marks given in Section-D. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.

SECTION-A

- Q1. Name the pyrimidine bases found in RNA. (1)
- Q2. Which vacuole is involved in the excretion of wastes in Amoeba? (1)
- Q3. Identify the type of tissue that constitutes the exocrine glands in animals? (1)
- Q4. Where is notochord present in Urochordata? (1)
- Q5. What is the site of Calvin cycle in (i) a C_4 plant and (ii) a C_3 plant respectively? (1)

SECTION-B

- Q6. How does abscisic acid act antagonistically to auxins and gibberellins? (2)
- Q7. Describe the blood vessels called vasa recta found in relation to uriniferous tubules. What is their function? (2)

OR

- Describe the basic layers of the wall of alimentary canal in humans. (2)
- Q8. What are herbarium sheets? Mention the information provided on the labels present on herbarium sheets. (2)
- Q9. Proteins may exist in their primary, secondary, tertiary or quaternary structure. Describe the quaternary structure of a protein with the help of an example. (2)
- Q10. Give a technical term for the following conditions in angiosperms : (2)
- (a) stamens attached to petals
 - (b) fused carpels
 - (c) inner layer of seed coat
 - (d) arrangement of flowers on floral axis

SECTION-C

- Q11. Describe the structure of a monocotyledonous seed. (3)
- Q12. (a) Write the floral formula for plant family Solanaceae.
(b) Draw a floral diagram to represent the plant family to which Pisum sativum belongs?
(c) What is staminode? (3)
- Q13. What constitutes the stele in a dicot root? Describe the structure of its components. (3)
- Q14. Schematically represent the life cycle of an angiosperm. (3)
- Q15. (a) What forms cytoskeleton in a cell? State the function performed by these elements. (2)

(2)

- (b) Give a term to describe the colourless plastids that store nutrients in plants. What is stored in elaioplasts? (3)
- Q16. (a) What are competitive inhibitors? How do they affect enzymatic activity?
(b) Differentiate between ligases and lyases. (3)
- Q17. Name one enzyme of gastric juice and one of pancreatic juice that are released as proenzymes in the human alimentary canal. Give the substrate and end product of each.

OR

- How are respiratory gases transported in human blood? (3)
- Q18. Describe nitrification along with the equation and the organisms involved in each step. (3)
- Q19. (a) Schematically represent the formation of ATP through chemiosmosis in a chloroplast.
(b) What are light harvesting complexes made up of? (3)
- Q20. (a) Name the oxygen binding pigment found in root nodules of plants like beans and peas.
(b) In what form is phosphorus absorbed by plants? Mention two important roles of it in plants. (3)

SECTION-D

- Q21. Name the end product of glycolysis. Where is it produced in a cell? Explain its aerobic oxidation with the help of a schematic representation.

OR

- Explain the pressure flow hypothesis for translocation of sugars from source to sink. (5)
- Q22. Differentiate between Anaphase of mitosis and Anaphase I of meiosis. Also, draw well labelled diagrams of these stages.

(3)

OR

- (a) Draw a well labelled diagram of a chloroplast.
 - (b) There is division of labour in chloroplast. Justify.
- (5)

Q23. Describe briefly the structure of parts of human internal ear involved in hearing.

OR

- (a) Name the bones of hindlimb and their number in our body.
 - (b) What is the role of sarcoplasmic reticulum, myosin head and F-actin during contraction of striated muscles of humans?
- (5)

SECTION-E (OTBA)

Q24. Slowing down of body metabolism is indicative of a disorder related to imbalance in production of certain thyroid hormones.

- (a) Identify the disorder.
 - (b) How is the secretion of hormones affected?
 - (c) Suggest some changes that can be brought in the lifestyle to prevent this disorder.
- (5)

Q25. (a) What are the lifestyle factors that increases the risk of diabetes and what is its major indication?

- (b) Where is the pancreas located? State its endocrine function.
- (5)

SUBJECT : PHYSICS (SET-II)

Time : 3 Hrs.

M.M.: 70

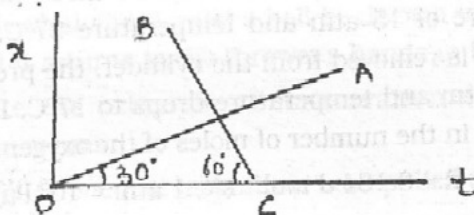
General Instructions :

- (i) All questions are compulsory.
- (ii) Question numbers 1 to 5 are very short answer questions carrying 1 mark each.
- (iii) Question numbers 6 to 10 are short answer questions carrying 2 marks each.
- (iv) Question numbers 11 to 22 are also short answer questions carrying 3 marks each.
- (v) Question number 23 is a value based question carrying 4 marks.
- (vi) Question numbers 24 to 26 are long answer questions carrying 5 marks each.
- (vii) Use of calculators is not allowed.
- (viii) You may use the following constants :

$$G = 6.6 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$$

SECTION-A

- Q1. Two bodies move in two concentric circular paths of radii r_1 and r_2 ($r_2 > r_1$) with same time period. What is the ratio of their angular velocities?
- Q2. What would be the effect on the viscosity of a liquid if its temperature is increased?
- Q3. The displacement-time graph of two bodies P and Q are represented by lines OA and BC respectively. What is the ratio of velocities of P and Q?

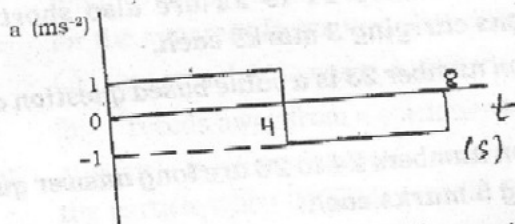


(1)

- Q4. Are the magnitude and direction of $\vec{A} \times \vec{B}$ and $\vec{B} \times \vec{A}$ same? Justify your answer.
- Q5. A tuning fork A produces 5 beats with another tuning fork B of frequency 255 Hz. When A is filed, then the beats frequency increases. Find the frequency of fork A.

SECTION-B

- Q6. A particle starts from rest and moves along a straight line in positive-x direction. Acceleration-time graph of the particle is shown. Draw its velocity-time graph and calculate the distance covered by the particle in 8s.

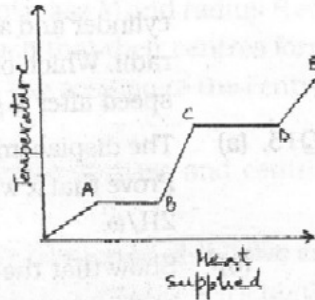


- Q7. Two billiard balls each of mass 0.05 kg moving in opposite directions with speed 6 m/s each collide and rebound with same speed. What is the impulse imparted to each ball due to the other?
- Q8. A satellite of mass m orbits a planet of mass M in a circular orbit of radius r with angular speed ω . Show that r and ω are related by the expression : $r^3\omega^2 = \text{constant}$. Also find the value of the constant in terms of G and M .

OR

- If the density of the earth becomes 2 times its present value, mass remaining unchanged; then how would the weight of an object on the surface of the earth be affected?
- Q9. An oxygen cylinder of volume 30 litres has an initial pressure of 15 atm and temperature 27°C. After some oxygen is removed from the cylinder, the pressure drops to 11 atm and temperature drops to 17°C. Estimate the change in the number of moles of the oxygen.
(Given : $R = 8.134 \text{ J mol}^{-1} \text{ K}^{-1}$, $1 \text{ atm} = 10^5 \text{ Pa}$)

Q10. A solid substance is heated. The given figure shows variation of temperature with the supplied heat. Study the graph carefully and answer the questions :



- (i) What do the horizontal regions AB and CD represent?
- (ii) What does the slope of DE represent?

SECTION-C

- Q11. (a) Write the dimensions of torque.
 (b) The frequency of vibrations of a mass 'm' suspended from a spring of spring constant k is given by the relation : $f = Cm^xk^y$, where C is a dimensionless constant. Find the value of x and y.
- Q12. A body of mass 0.3 kg is taken up an inclined plane of length 10m and height 5m and then allowed to slide down to the bottom. The coefficient of friction between the body and the plane is 0.15. What is the -
- (a) work done by gravitational force as the body is taken up?
 - (b) work done by gravitational force over the round trip?
 - (c) work done by frictional force over the round trip?
- Q13. (a) The displacement (x) of a particle moving in 1d is related to time by the equation, $t = \sqrt{x} - 3$. Find the speed of the particle. Also find the acceleration of the particle.
 (b) With what speed must a ball be thrown upwards so that it returns to the thrower's hands in 5s?
- Q14. (a) State the principle of conservation of angular momentum.
 (b) Torques of equal magnitude are applied to a hollow

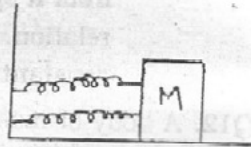
cylinder and a solid cylinder of same mass and same radii. Which of the two will acquire a greater angular speed after a given time? Explain.

- Q15. (a) The displacement in a SHM is given by : $x = A \sin \omega t$. Prove that x will remain same if time is increased by $2\pi/\omega$.
- (b) Show that the particle velocity in SHM is maximum at the mean position and minimum at the extreme position.

OR

A block of mass 3 kg is connected to two identical springs of spring constant 600 N/m each as shown. The mass is displaced from its equilibrium position by 5cm and released. What is the -

- (a) time period of oscillations?
 (b) total energy of the system?
 (c) maximum speed of the block?



- Q16. Write the SI units of Bulk modulus of elasticity. A spherical ball contracts by 0.09% volume when subjected to a pressure of 100 kPa. Calculate its Bulk modulus.
- Q17. A projectile of mass m is fired at an angle θ with the horizontal with speed u in upwards direction. Find expressions for the (i) maximum height reached (ii) KE at the maximum height.
- Q18. Write the equation of state for an adiabatic process. Draw P-V diagram and find its slope for an adiabatic process. Calculate the fall in temperature of Helium, initially at 27°C , when suddenly expanded to 8 times its volume.
 ($\gamma = 5/3$)
- Q19. (a) A satellite revolves around a planet with orbital speed v . Obtain an expression for v .
- (b) Show that the satellite revolving around the earth would escape forever if its speed increases by 42%.

- Q20. (a) Four identical spheres of mass M and radius R each are placed on a table such that their centres form a square of side $2R$. Find the position of the centre of mass of this system.
- (b) Distinguish between centre of mass and centre of gravity of a body.
- Q21. Two masses 8 kg and 12 kg are connected at the two ends of a light inextensible thread that goes over a frictionless pulley. Find the acceleration of the masses and the tension in the string when the masses are released from rest. What will be the speed of the 12 kg block after 1 s of its release?
- Q22. A bob of mass m is suspended from a light string of length L . It is imparted a horizontal velocity V_0 at its lowest point so that it just completes the vertical circle. Find an expression for V_0 in terms of L and g .

SECTION-D

- Q23. Manas and his friends were enjoying the birthday party of one of their friends. They were dancing and playing various games. They were feeling very hot. As there was no A.C. in the room, one of them got an idea. He opened the door of refrigerator thinking that this might relieve him from heat. On seeing this, Manas immediately rushed towards him and made him understand that this would rather increase the temperature of room. He told him to rest for sometime. His friend understood this and closed the door of refrigerator at once.
- (i) What qualities of Manas do you appreciate?
- (ii) Temperature inside a refrigerator is 270 K and room temperature is 315 K . Find the coefficient of performance of refrigerator.

SECTION-E

- Q24. State and prove Bernoulli's Theorem. Explain any two applications of Bernoulli's principle.

OR

What do you mean by capillarity? On the basis of excess pressure, explain the reason for the rise of water in a narrow glass tube and find expression for the height upto which water rises.

Q25. (a) Show that the ratio of frequencies of harmonics in a closed organ pipe is 1:3:5:7.

(b) For a travelling harmonic wave.

$y = 2 \cos 2\pi (10t - 0.08x)$ cm. Calculate the wave velocity.

OR

(i) What is doppler effect in sound? Write expressions for the apparent frequency when a source -

(a) approaches towards a stationary observer

(b) recedes away from a stationary observer.

(ii) A particle is executing SHM. Identify the position of the particle when (a) KE is zero (b) PE is zero (c) PE and KE are equal.

Q26. What is the need for the banking the tracks? Obtain an expression for the speed of a vehicle when it takes a turn on a rough banked road.

OR

Explain why -

(a) a cricketer moves his hands backwards while holding a catch.

(b) it is easier to pull a roller than to push it.

(c) friction is a necessary evil.

(d) static friction is self adjusting.

(e) no work is done against friction in pure rolling.

SUBJECT : CHEMISTRY (SET-II)

M.M.: 70

Time : 3 Hrs.

General Instructions :

- i) All questions are compulsory.
- ii) Question numbers 1 to 5 are very short answer type questions of 1 mark each.
- iii) Question numbers 6 to 10 are short answer type questions of 2 marks each.
- iv) Question numbers 11 to 22 are also short answer type questions of 3 marks each.
- v) Question number 23 is a value based question carrying 4 marks.
- vi) Question numbers 24 to 26 are long answer type questions of 5 marks each.
- vii) Use log tables, if necessary. Use of calculators is not allowed.

- Q1. Write the general electronic configuration of f-block elements.
- Q2. How many significant figures are present in 0.6002?
- Q3. Do you expect the carbon hydride of the type C_nH_{2n+2} to act as lewis acid or base? Justify your answer.
- Q4. How are classical and photochemical smog different?
- Q5. The expected electronic configuration of chromium is $[Ar] 3d^4 4s^2$, though actually it is $[Ar] 3d^5 4s^1$. Give reason.
- Q6. A weather balloon has a volume of 175L when filled with hydrogen at a pressure of 1.00 atm. Calculate volume of the balloon when it rises to a height of 2000m, where the atmospheric pressure is 0.80 atm. Assume that the temperature is constant.
- Q7. How many moles of NaOH are contained in 27 mL of 0.15M NaOH solution?

Q8. Predict the nature of entropy change in the following:

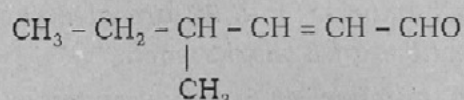
(i) One gram of water evaporates into steam at the same pressure and temperature.

(ii) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$

OR

Calculate the number of KJ necessary to raise the temperature of 60.0 g of aluminium from 25 to 50°C. Molar heat capacity of Al is $24\text{J mol}^{-1}\text{K}^{-1}$.

Q9. (a) Write the IUPAC name of :



(b) Write the structural formula of 4-Cyano-3-methoxybutanoic acid.

Q10. An organic compound contains 60.0% C, 4.48% H, and the rest oxygen. Determine the empirical formula of the organic compound.

Q11. Explain the following :

(i) The second ionisation energy of an element is higher than the first ionisation energy.

(ii) Halogens show exceptionally large electron gain enthalpies.

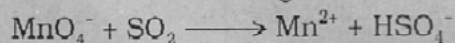
Q12. Density of a gas is found to be 5.46 g/dm^3 at 27°C at 2 bar pressure. What will be its density at STP?

OR

(a) What is meant by surface tension of a liquid? How does surface tension of a liquid vary with temperature?

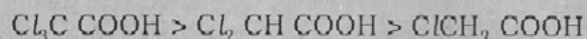
(b) Why does boiling point of water lower at higher altitudes?

Q13. Balance the following reaction in acidic medium :

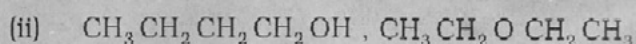
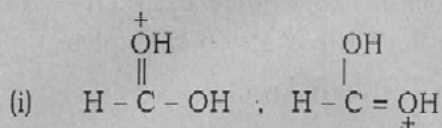


- Q14. Draw the MO diagram for the O_2 molecule and determine the bond order and the magnetic character.
- Q15. Determine the standard free energy ΔG° at $25^\circ C$ for the reaction, $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$. (Given : $\Delta H^\circ = -91.8 \text{ KJ/mol}$, $\Delta S^\circ = -198 \text{ JK}^{-1} \text{ mol}^{-1}$.) Also predict whether the reaction is spontaneous or not?
- Q16. (a) Write down the chemical equation which forms the basis of softening of water by synthetic resin method.
- (b) What is the difference between hydrolysis and hydration? Explain with examples.
- Q17. Give reason for the following :
- Potassium and cesium, rather than lithium are used in photoelectric cells.
 - Sodium is less reactive than potassium.
 - BaO is soluble but $BaSO_4$ is insoluble in water.
- Q18. State as to why :
- Boron forms electron-deficient compounds.
 - CCl_4 is resistant to hydrolysis but $SiCl_4$ is readily hydrolysed.
 - Graphite is used as lubricant.
- Q19. Write the balanced equation for the following reaction:
- $BCl_3 + H_2O \longrightarrow$
 - $BH_3 + LiH \longrightarrow$
 - $Na_2O + H_2O \longrightarrow$
- Q20. (i) Hydrocarbons with odd number of carbon atoms have lower melting points than those with even number of carbon atoms. Explain why?
- (ii) Draw the cis and trans structures of hex-2-ene.
- (iii) What are the necessary conditions for any system to be aromatic?

- Q21. (a) Explain the terms Inductive and Electromeric effect. Which electron displacement effect explains the following correct orders of acidity of the carboxylic acids?



- (b) What is the relationship between the members of the following pairs of structures? Are they identical, structural or geometrical isomers or resonance contributors?



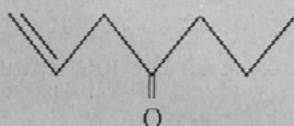
- Q22. (a) Which out of the two molecules OCS and CS₂ has a higher dipole moment and why?
- (b) What is the state of hybridisation of P in PF₅ molecule?
- (c) Draw the shape of ClF₃ molecule on the basis of VSEPR theory.

Q23. On a very cold winter night, Vani's servant put burning angithi in his room to protect his family from cold. At night he closed his room with a coke fire burning inside the room. Vani noticed her servant and asked him not to sleep in a closed room with coke fire burning inside the room. Vani's servant could not understand her. Vani explained him that it is very dangerous and may cause even death. Her servant agreed to her advice.

After reading this passage answer the following questions:

- (i) Why did Vani ask her servant not to sleep in a closed room with burning fire?

- (ii) What values are associated with Van der Waals' behaviour?
- Q4. (a) How are the following conversions carried out?
- Acetylene to ethanal
 - benzene to p-Nitrotoluene
 - bromoethane to butane
- (b) Calculate the number of σ (sigma) and Π (pi) bonds in the structure :



- (c) Arrange benzene, n-hexane and ethyne in decreasing order of acidic behaviour.

OR

- (a) Draw the resonating structures of phenol (C_6H_5OH).
- (b) Explain the following reactions, giving one example of each :
- Friedel-Crafts acylation
 - Decarboxylation reaction
 - Peroxide effect (Anti-Markovnikov's addition)
- Q25. (a) What is the energy in joules required to shift the electron of the hydrogen atom from the first Bohr orbit to the fifth Bohr orbit, and what is the wavelength of the light that can be used to cause this transition? [Given $E_n = \frac{-2.18 \times 10^{-18}}{n^2}$ joules, $h = 6.626 \times 10^{-34} \text{ JS}^{-1}$]

- (b) What is photoelectric effect?

- (c) Which quantum number specifies the shape of a subshell?

OR

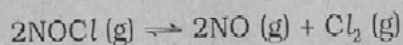
- (a) Calculate the wavelength of an electron moving with the velocity of $2.05 \times 10^7 \text{ ms}^{-1}$.

(Given $m_e = 9.1 \times 10^{-31} \text{ kg}$)

- (b) State Hund's rule of maximum multiplicity.

- (c) An electron is in one of the 4f orbitals. Give the possible values of all the four quantum numbers for this electron.

- Q26. (a) At 500K, $K_p = 1.8 \times 10^{-2} / \text{bar}$ for the given reaction at equilibrium.



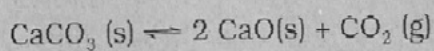
What is K_c at this temperature?

- (b) What is a buffer solution? Give an example of acidic buffer.
- (c) What is the effect of a change in pressure on the solubility of gases in liquids?

OR

- (a) The pH of a sample of vinegar is 3.76. Calculate the concentration of hydrogen ion in it.

- (b) Consider the reaction :



$$\Delta H^\circ = +179.1 \text{ KJ mol}^{-1}$$

Indicate the direction in which equilibrium will shift when :

- (i) concentration of CaO is decreased.
- (ii) Temperature is increased.
- (c) Write the conjugate acid for HCO_3^- .

SUBJECT : MATHEMATICS (SET-II)

Time : 3 Hrs.

M.M.: 100

General Instructions :

- (i) Read all questions carefully.
- (ii) The question paper consists of 29 questions.
- (iii) The question paper consists of four sections A, B, C and D. Section-A comprises of 4 questions of 1 mark each, Section-B comprises of 8 questions of 2 marks each, Section-C comprises of 11 questions of 4 marks each and Section-D comprises of 6 questions of 6 marks each.
- (iv) Use of calculators is not allowed.

SECTION-A

- Q1. Define Greatest Integer function and draw its graph.
- Q2. Find the least value of n for which $1 + 3 + 3^2 + \dots + n$ terms is greater than 7000.
- Q3. Find the 4th term from the end in the expansion of

$$\left(\frac{3}{x^2} - \frac{x^3}{6} \right)^7$$

- Q4. Find the coordinates of focus and equation of directrix for $3y^2 = -8x$

SECTION-B

- Q5. Write $A = \{x : x = \frac{n}{n^2 + 1} \text{ \& } 1 \leq n \leq 3, \text{ where } n \in \mathbb{N}\}$ in roaster form and find $P(A)$.
- Q6. How many words can be formed out of the letters of the word 'OBEDIENCE' so that vowels and consonants occur together? Write importance of OBEDIENCE in our life.
- Q7. For any two complex numbers z_1 and z_2 , prove that

$$\text{Im}(z_1 z_2) = \text{Re} z_1 \cdot \text{Im} z_2 + \text{Re} z_2 \cdot \text{Im} z_1$$

(1)

Q8. Find the points on the z-axis which are at a distance of 6 units from the point $(-4, 2, -1)$

Q9. If in an A.P., the first term is a and the sum of first p terms is zero, show that the sum of the next q terms is $\frac{-a(p+q)q}{p-1}$

Q10. Find the modulus and conjugate of $1 + i\sqrt{3}$

Q11. Find eccentricity, length of conjugate and transverse axes for $y^2 - 16x^2 = 16$.

Q12. In a single throws of two dice, what is the probability of getting :

(i) a multiple of 2 on one dice and a multiple of 3 on the other?

(ii) the sum as a prime number?

SECTION-C

Q13. Find the square root of $-15 - 8i$

Q14. If the fourth term in the expansion of $\left(ax + \frac{1}{x}\right)^n$ is $\frac{5}{2}$,

then find the values of a and n , hence expand $\left(ax + \frac{1}{x}\right)^n$

Q15. Evaluate : $\lim_{x \rightarrow 0} \frac{\tan x - \sin x}{\sin^3 x}$

Q16. Find the domain and range of $f(x) = \frac{1}{\sqrt{1-x^2}}$

Q17. Prove that : $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$

OR

Prove that : $\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$

(2)

Q18. Using PMI, prove that :

$$\frac{1}{1.2.3} + \frac{1}{2.3.4} + \frac{1}{3.4.5} + \dots + \frac{1}{n(n+1)(n+2)} = \frac{n(n+3)}{4(n+1)(n+2)}$$

for all $n \in \mathbb{N}$.

Q19. If the points A (1, 0, -6), B (-3, p, q) and C (-5, 9, 6) are collinear, find the values of p and q.

Q20. Find the image of the point (3, 8) with respect to the line $x + 3y = 7$, assuming the line to be a plane mirror.

Q21. Find the equation of the circle passing through the points (2, 3), (-1, 1) and whose centre lie on line $x - 3y = 11$.

OR

Find the coordinates of foci, vertices, the lengths of major axis, minor axis, latus rectum and eccentricity of $9x^2 + 25y^2 = 225$.

Q22. (i) Evaluate : $\lim_{x \rightarrow 0} \frac{(x+2)^{1/3} - 2^{1/3}}{x}$

(ii) Find the derivative of $f(x) = \sqrt{\tan(19x^2 + 10x + 4)}$

Q23. How many numbers are there between 100 and 1000 (including 100 but excluding 1000) such that

(i) at least one of the digits is 5.

(ii) atleast one of the digits is repeated.

OR

Find the number of ways of choosing a committee from four men and six women so that the committee includes atleast two men and exactly twice as many women as men. Should women be given equal rights? What values are being promoted?

SECTION-D

Q24. Find the sum of first n terms of the series :

$$6 + 9 + 16 + 27 + 42 + \dots$$

OR

A line is such that its segment between the lines, $5x - y + 4 = 0$ and $3x + 4y - 4 = 0$ is bisected at the point (1, 5). Obtain its equation.

Q25. Find the derivatives of :

(i) $f(x) = \frac{x \tan x}{\sec x + \tan x}$

(ii) $f(x) = (3x + 4)(5x^2 - 7x + 9)$

Q26. Calculate the mean and standard deviation for the following data :

Wage per day (In ₹)	No. of workers
0-100	9
100-200	17
200-300	32
300-400	23
400-500	40
500-600	18
600-700	1

Q27. (i) Solve : $\cot^2 \theta + \frac{3}{\sin \theta} + 3 = 0$ (4)

(ii) In a right angled triangle, the difference between two acute angles is $\frac{\pi}{18}$ in radian measure. Express the angles in degrees. (2)

Q28. Solve the following system of linear inequalities graphically:
 $12x + 12y \leq 840$, $3x + 6y \leq 300$, $8x + 4y \leq 480$, $x, y \geq 0$

Q29. If the letters of the word ASSASSINATION are arranged at random in a row, find the probability that

- (i) four S's come together.
- (ii) all A's are not coming together.
- (iii) no two A's are coming together.

OR

Find the probability that when a hand of 7 cards is drawn from a well-shuffled deck of 52 cards, it contains (i) all kings (ii) exactly 3 kings (iii) atleast 3 kings.

SUBJECT : PHYSICS (SET-II)

Time : 3 Hrs.

M.M.: 70

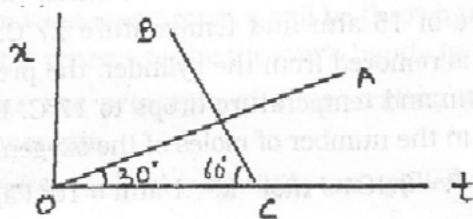
General Instructions :

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- (iv) Question numbers 11 to 22 are also short answer questions carrying 3 marks each.
- (v) Question number 23 is a value based question carrying 4 marks.
- (vi) Question numbers 24 to 26 are long answer questions carrying 5 marks each.
- (vii) Use of calculators is not allowed.
- (viii) You may use the following constants :

$$G = 6.6 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$$

SECTION-A

- Q1. Two bodies move in two concentric circular paths of radii r_1 and r_2 ($r_2 > r_1$) with same time period. What is the ratio of their angular velocities?
- Q2. What would be the effect on the viscosity of a liquid if its temperature is increased?
- Q3. The displacement-time graph of two bodies P and Q are represented by lines OA and BC respectively. What is the ratio of velocities of P and Q?

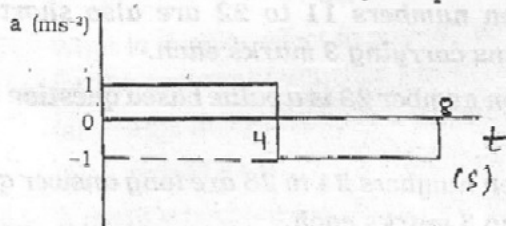


(1)

- Q4. Are the magnitude and direction of $\vec{A} \times \vec{B}$ and $\vec{B} \times \vec{A}$ same? Justify your answer.
- Q5. A tuning fork A produces 5 beats with another tuning fork B of frequency 255 Hz. When A is filed, then the beats frequency increases. Find the frequency of fork A.

SECTION-B

- Q6. A particle starts from rest and moves along a straight line in positive-x direction. Acceleration-time graph of the particle is shown. Draw its velocity-time graph and calculate the distance covered by the particle in 8s.

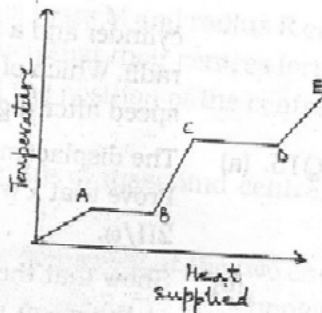


- Q7. Two billiard balls each of mass 0.05 kg moving in opposite directions with speed 6 m/s each collide and rebound with same speed. What is the impulse imparted to each ball due to the other?
- Q8. A satellite of mass m orbits a planet of mass M in a circular orbit of radius r with angular speed ω . Show that r and ω are related by the expression : $r^3\omega^2 = \text{constant}$. Also find the value of the constant in terms of G and M .

OR

- If the density of the earth becomes 2 times its present value, mass remaining unchanged; then how would the weight of an object on the surface of the earth be affected?
- Q9. An oxygen cylinder of volume 30 litres has an initial pressure of 15 atm and temperature 27°C . After some oxygen is removed from the cylinder, the pressure drops to 11 atm and temperature drops to 17°C . Estimate the change in the number of moles of the oxygen.
(Given : $R = 8.134 \text{ J mol}^{-1} \text{ K}^{-1}$, $1 \text{ atm} = 10^5 \text{ Pa}$)

Q10. A solid substance is heated. The given figure shows variation of temperature with the supplied heat. Study the graph carefully and answer the questions :



- (i) What do the horizontal regions AB and CD represent?
- (ii) What does the slope of DE represent?

SECTION-C

- Q11. (a) Write the dimensions of torque.
 (b) The frequency of vibrations of a mass 'm' suspended from a spring of spring constant k is given by the relation : $f = Cm^x k^y$, where C is a dimensionless constant. Find the value of x and y.

Q12. A body of mass 0.3 kg is taken up an inclined plane of length 10m and height 5m and then allowed to slide down to the bottom. The coefficient of friction between the body and the plane is 0.15. What is the -

- (a) work done by gravitational force as the body is taken up?
- (b) work done by gravitational force over the round trip?
- (c) work done by frictional force over the round trip?

Q13. (a) The displacement (x) of a particle moving in 1d is related to time by the equation, $t = \sqrt{x} - 3$. Find the speed of the particle. Also find the acceleration of the particle.

- (b) With what speed must a ball be thrown upwards so that it returns to the thrower's hands in 5s?

Q14. (a) State the principle of conservation of angular momentum.

- (b) Torques of equal magnitude are applied to a hollow

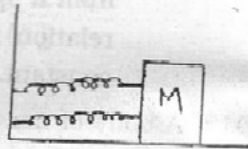
cylinder and a solid cylinder of same mass and same radii. Which of the two will acquire a greater angular speed after a given time? Explain.

- Q15. (a) The displacement in a SHM is given by : $x = A \sin \omega t$. Prove that x will remain same if time is increased by $2\pi/\omega$.
- (b) Show that the particle velocity in SHM is maximum at the mean position and minimum at the extreme position.

OR

A block of mass 3 kg is connected to two identical springs of spring constant 600 N/m each as shown. The mass is displaced from its equilibrium position by 5cm and released. What is the -

- (a) time period of oscillations?
(b) total energy of the system?
(c) maximum speed of the block?



- Q16. Write the SI units of Bulk modulus of elasticity. A spherical ball contracts by 0.09% volume when subjected to a pressure of 100 kPa. Calculate its Bulk modulus.
- Q17. A projectile of mass m is fired at an angle θ with the horizontal with speed u in upwards direction. Find expressions for the (i) maximum height reached (ii) KE at the maximum height.
- Q18. Write the equation of state for an adiabatic process. Draw P-V diagram and find its slope for an adiabatic process. Calculate the fall in temperature of Helium, initially at 27°C , when suddenly expanded to 8 times its volume.
($\gamma = 5/3$)
- Q19. (a) A satellite revolves around a planet with orbital speed v . Obtain an expression for v .
- (b) Show that the satellite revolving around the earth would escape forever if its speed increases by 42%.

- Q20. (a) Four identical spheres of mass M and radius R each are placed on a table such that their centres form a square of side $2R$. Find the position of the centre of mass of this system.
- (b) Distinguish between centre of mass and centre of gravity of a body.
- Q21. Two masses 8 kg and 12 kg are connected at the two ends of a light inextensible thread that goes over a frictionless pulley. Find the acceleration of the masses and the tension in the string when the masses are released from rest. What will be the speed of the 12 kg block after 1 s of its release?
- Q22. A bob of mass m is suspended from a light string of length L . It is imparted a horizontal velocity V_0 at its lowest point so that it just completes the vertical circle. Find an expression for V_0 in terms of L and g .

SECTION-D

- Q23. Manas and his friends were enjoying the birthday party of one of their friends. They were dancing and playing various games. They were feeling very hot. As there was no A.C. in the room, one of them got an idea. He opened the door of refrigerator thinking that this might relieve him from heat. On seeing this, Manas immediately rushed towards him and made him understand that this would rather increase the temperature of room. He told him to rest for sometime. His friend understood this and closed the door of refrigerator at once.
- (i) What qualities of Manas do you appreciate?
- (ii) Temperature inside a refrigerator is 270 K and room temperature is 315 K . Find the coefficient of performance of refrigerator.

SECTION-E

- Q24. State and prove Bernoulli's Theorem. Explain any two applications of Bernoulli's principle.

OR

What do you mean by capillarity? On the basis of excess pressure, explain the reason for the rise of water in a narrow glass tube and find expression for the height upto which water rises.

Q25. (a) Show that the ratio of frequencies of harmonics in a closed organ pipe is 1:3:5:7.

(b) For a travelling harmonic wave,

$y = 2 \cos 2\pi (10t - 0.08x)$ cm. Calculate the wave velocity.

OR

(i) What is doppler effect in sound? Write expressions for the apparent frequency when a source -

(a) approaches towards a stationary observer

(b) recedes away from a stationary observer.

(ii) A particle is executing SHM. Identify the position of the particle when (a) KE is zero (b) PE is zero (c) PE and KE are equal.

Q26. What is the need for the banking the tracks? Obtain an expression for the speed of a vehicle when it takes a turn on a rough banked road.

OR

Explain why -

(a) a cricketer moves his hands backwards while holding a catch.

(b) it is easier to pull a roller than to push it.

(c) friction is a necessary evil.

(d) static friction is self adjusting.

(e) no work is done against friction in pure rolling.

Final Term

Class-XI

SUBJECT: PHYSICAL EDUCATION (Code No. 048)

Time: 3 hrs.

M.M.: 70

General Instructions:

- (i) All questions are compulsory.
- (ii) Answer to questions (1-11) carrying 1 mark should be in approximately 30 words.
- (iii) Answer to questions (12-19) carrying 3 marks should be in approximately 100 words.
- (iv) Answer to questions (20-25) carrying 5 marks should be in approximately 150-200 words.

- Q1. What do you mean by recovery? (1)
- Q2. What is style? (1)
- Q3. Define sports psychology. (1)
- Q4. What is Static Equilibrium? (1)
- Q5. What do you mean by slow twitch fibers? (1)
- Q6. Define Physical Activity? (1)
- Q7. Enlist the types of doping? (1)
- Q8. What is meditation? (1)
- Q9. What is the aim of Physical Education? (1)
- Q10. What is the aim of CBSE sports? (1)
- Q11. What is technique? (1)
- Q12. Explain any three Elements of Yoga? (3)
- Q13. What are the side effects of anabolic steroids? (3)
- Q14. Discuss any three components of health related physical fitness. (3)
- Q15. What are the traits of Endomorphs? (3)
- Q16. Discuss the major types of Joints. (3)
- Q17. Discuss the law of Inertia and its application in sports. (3)
- Q18. Differentiate between growth and development. (3)
- Q19. What is Overload? Mention the symptoms of overload. (3)
- Q20. What do you mean by test and measurement? Elucidate the importance of test and measurement in the field of sports. (5)
- Q21. Explain about second wind and changes that occur in our body due to second wind. (5)
- Q22. What do you mean by levers? Elaborate the applications of levers in sports. (5)

Q23. Discuss the laws of learning along with their application in sports. (5)

Or

What do you mean by Plateau? Elaborate the causes of Plateau in the field of physical education and sports

Q24. What do you mean by Sports training? Explain the principles of sports training. (5)

Q25. Define warming up. Explain the types of warming up. (5)

or

Discuss any five principles of physical activity.

Q26. What do you mean by common lifestyle diseases? Discuss any one in detail. (5)

Or

Discuss in detail about Chacha Nehru Sports Award.