

**Class: XII**  
**Biology-044**  
**Sample Question Paper 2018-19**

MM: 70

TIME: 3HOURS

**General Instructions:**

1. All questions are compulsory.
2. The question paper consists of four sections A, B, C and D.
3. Internal choice is given in all the sections. **A student has to attempt only one of the alternatives in such questions.**
4. Section–A contains 5 questions of 1 mark each.
5. Section–B has 7 questions of 2 marks each.
6. Section–C is of 12 questions of 3 marks each
7. Section–D has 3 questions of 5 marks each.
8. Wherever necessary, the diagrams drawn should be neat and properly labelled.

**SECTION- A**

1. How many pollen grains and ovules are likely to be formed in the anther and the ovary of an angiosperm bearing 25 microspore mother cells and 25 megaspore mother cells respectively? 1

OR

In case of polyembryony, an embryo A develops from the synergids and the embryo B develops from the nucellus. State the ploidy of embryo A and B.

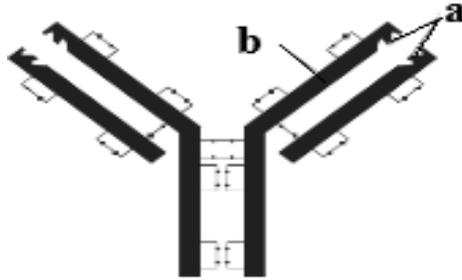
2. Give the scientific name of the source organism from which the first antibiotic was produced. 1
3. The prophase I stage of meiosis plays a vital role in r-DNA formation. Justify with reason. 1
4. Name the technique by which Gene expression can be controlled with the help of RNA molecule. 1
5. Define Diapause 1

OR

Define Standing Crop

## SECTION- B

6. The figure given below represents a molecule present in the body of a mammal - 2



- a) Name the parts labelled 'a' and 'b' in the molecule shown above.  
b) Name the type of cells that produce this molecule.

OR

Life style diseases are increasing alarmingly in India. We are also dealing with large scale malnutrition in the population. Suggest a process by which we can address both these problems. Give any three examples to support your answer.

7. Why does the lac operon shut down some time after the addition of lactose in the medium where *E.coli* was growing? Why low level expression of lac operon is always required? 2
8. a) While cloning vectors, which of the two will be preferred by biotechnologists - bacteriophages or plasmids. Justify with reason. 2  
b) Name the first transgenic cow developed and state the improvement in the quality of the product produced by it.
9. Explain the impact of removal of thymus gland on the immune system of a human body. 2

OR

A farmer maintained beehives in his *Brassica* field during its flowering season. How will he be benefitted?

10. How do automobiles fitted with catalytic converters reduce air pollution? Suggest the best fuel for such vehicles. 2
11. State the Mendelian principle which can be derived from a dihybrid cross and not from monohybrid cross. 2
12. Comment upon the mode of pollination in *Vallisneria* and *Eichhornia* which have emergent flowers. 2

## SECTION- C

13. Alien species are highly invasive and are a threat to indigenous species. Substantiate this statement with any three examples. 3
14. The embryo sac in female gametophyte is seven celled and eight nucleated structure. Justify the statement with the help of a labelled diagram. 3

OR

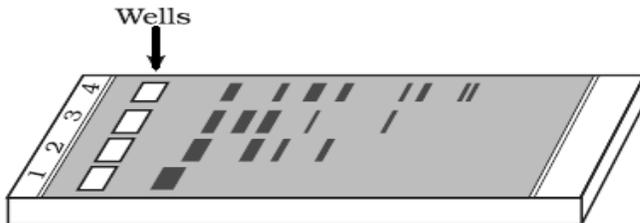
List the changes that occur when an ovule matures into seed.

15. Compare and contrast the theories of evolution proposed by Darwin and Hugo De Vries. 3
16. Explain the different steps involved in the secondary treatment of sewage. 3

OR

Microbes can be used to decrease the use of chemical fertilizers. Explain how this can be accomplished.

17. a) How do DNA fragments migrate and resolve in a Gel electrophoresis? 3  
b) How lane one is different from lane 2, 3 and 4 in the Gel electrophoresis set up?  
c) How pure DNA fragments are made observable in the visible light?



18. Suggest and explain the assisted reproductive techniques which will help a couple to have children, where the female had a blockage in the fallopian tube and the male partner had a low sperm count. 3
19. a) Construct a complete transcription unit with promoter and terminator on the basis of the hypothetical template strand given below: 3

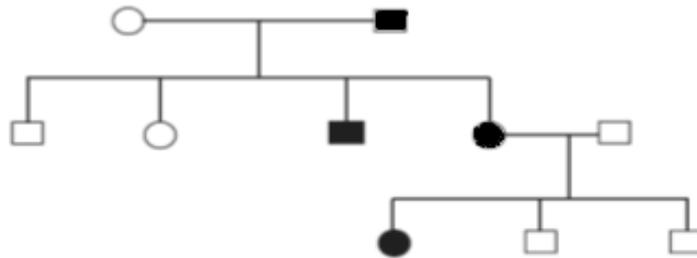


- b) Write the RNA strand transcribed from the above transcription unit along with its polarity.

OR

- a) Mention two events in which DNA is unzipped.
- b) Predict the consequences when both the template and the coding strands of a DNA segment participate in transcription process?

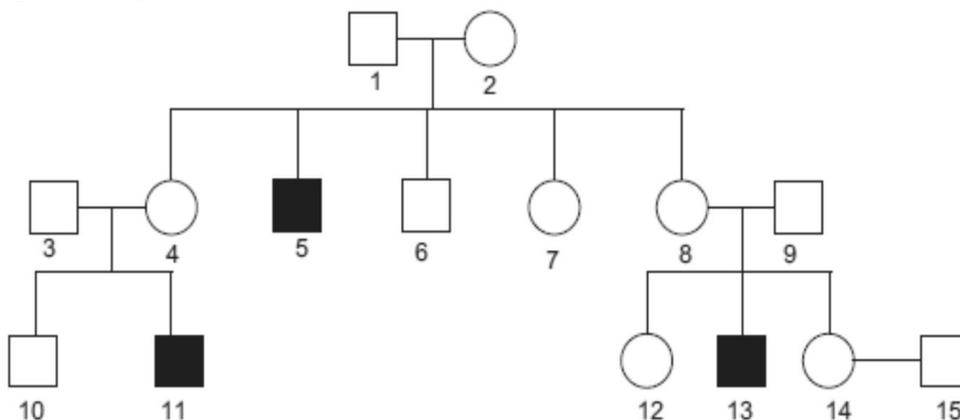
20. As a biologist explain the technique to a dairy farmer for increasing the yield of herd size of cattle in a short time. 3
21. The Indian Government refuted the attempt by a multinational company (MNC) to patent the antiseptic property of curcumin derived from Turmeric. Analyze the unethical practice adopted by the MNC, state its implications and suggest provisions in the Indian Law to prevent such malpractices. 3
22. A 17-year old boy is suffering from high fever with profuse sweating and chills. Choose the correct option from the following diseases which explains these symptoms and rule out the rest with adequate reasons. 3
- (a) Typhoid                      (b) Viral Fever(c) Malaria
23. Study the given pedigree chart and answer the questions that follow: 3



- (a) Is the trait recessive or dominant?  
 (b) Is the trait sex-linked or autosomal?  
 (c) Give the genotypes of the parents shown in generation I and their third child shown in generation II and the first grandchild shown in generation III.

OR

Haemophilia is a sex linked recessive disorder of humans. The pedigree chart given below shows the inheritance of Haemophilia in one family. Study the pattern of inheritance and answer the questions given.



- (a) Give all the possible genotypes of the members 4, 5 and 6 in the pedigree chart.  
(b) A blood test shows that the individual 14 is a carrier of haemophilia. The member numbered 15 has recently married the member numbered 14. What is the probability that their first child will be a haemophilic male.? Show with the help of Punnett square.

24. a) In a pond there were 200 frogs. 40 more were born in the year. Calculate the birth rate of the population. 3  
b) Population in terms of number is not always a necessary parameter to measure population density. Justify with two examples.

### SECTION- D

25. People living in the coastal areas are forced to evict their dwelling units as the sea has inundated into the land areas. State the possible reasons and suggest measures that could be taken to reduce the deleterious changes in the environment. 5

OR

A young sperm whale, 33-foot long was found dead off the coast. It had a large amount of human trash like trash bags, polypropylene sacks, ropes, net segments etc. amounting to 29 kilograms in its digestive system. The whale died because of inflammation of the abdominal lining. Analyze the possible reasons for such mishaps and suggest measures that can be taken to reduce such incidents.

26. Aneuploidy of chromosomes in human beings results in certain disorders. Draw out the possibilities of the karyotype in common disorders of this kind in human beings and its consequences in individuals. 5

OR

In a dihybrid cross, white eyed, yellow bodied female *Drosophila* was crossed with red eyed, brown bodied male *Drosophila*. The cross produced 1.3 percent recombinants and 98.7 progeny with parental type combinations in the F2 generation. Analyze the above observation and compare with the Mendelian dihybrid cross.

27. Differentiate between spermatogenesis and oogenesis. 5

OR

‘Parturition is induced by a complex Neuro endocrine mechanism’. Justify

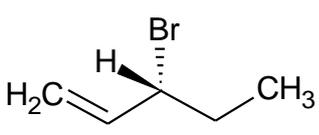
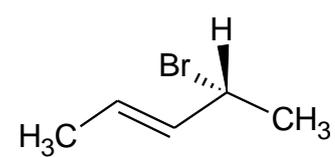
**Class XII**  
**Chemistry (Code – 043)**  
**Sample Question Paper 2018-19**

**Time allowed: 3 Hours**

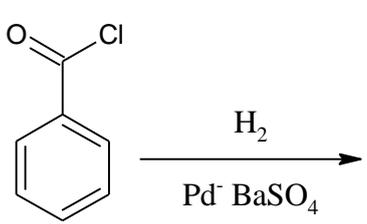
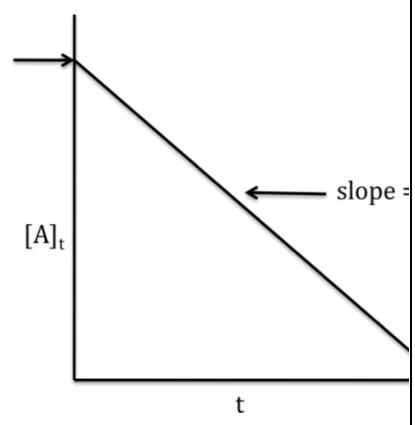
**Max. Marks: 70**

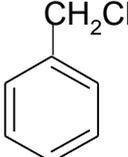
**General Instructions:**

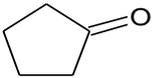
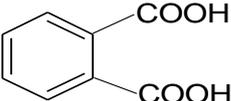
- (a) All questions are compulsory.  
 (b) Section A: Q.no. 1 to 5 are very short answer questions and carry 1 mark each.  
 (c) Section B: Q.no. 6 to 12 are short answer questions and carry 2 marks each.  
 (d) Section C: Q.no. 13 to 24 are also short answer questions and carry 3 marks each.  
 (e) Section D: Q.no. 25 to 27 are long answer questions and carry 5 marks each.  
 (f) There is no overall choice. However an internal choice has been provided in two questions of one mark, two questions of two marks, four questions of three marks and all the three questions of five marks weightage. You have to attempt only one of the choices in such questions.  
 (g) Use of log tables if necessary, use of calculators is not allowed.

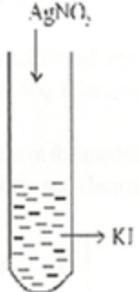
<b>Section-A</b>		
<b>1.</b>	ZnO crystal on heating acquires the formula $Zn_{1+x}O$ . Give reason.	<b>1</b>
	OR	
	There is an increase in conductivity when Silicon is doped with Phosphorous. Give reason	
<b>2.</b>	Based on the type of dispersed phase, what type of colloids are micelles?	<b>1</b>
<b>3.</b>	On the basis of crystal field theory, write the electronic configuration of $d^6$ in terms of $t_{2g}$ and $e_g$ in an octahedral field when $\Delta_o < P$ .	<b>1</b>
	OR	
	Low spin configuration are rarely observed in tetrahedral coordination entity formation. Explain	
<b>4.</b>	Identify the compound that on hydrogenation produces an optically active compound from the following compounds:  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>(A)</p> </div> <div style="text-align: center;">  <p>(B)</p> </div> </div>	<b>1</b>
<b>5.</b>	Write the name of the biodegradable polymer used in orthopaedic devices.	<b>1</b>

**Section-B**

<p><b>6.</b></p>	<p>Calculate the freezing point of a solution containing 8.1 g of HBr in 100 g of water, assuming the acid to be 90 % ionized. [Given: Molar mass Br = 80 g/mol, <math>K_f</math> water = 1.86 K kg / mol]</p> <p align="center">OR</p> <p>Calculate the molality of ethanol solution in which the mole fraction of water is 0.88.</p>	<p><b>2</b></p>
<p><b>7.</b></p>	<p>Identify the reaction and write the IUPAC name of the product formed:</p> <p>(a)</p> <p align="center"> <math>\text{CH}_3\text{-CH}_2\text{-COOH} \xrightarrow{\text{(i) Br}_2 / \text{Red phosphorous}}</math> </p> <p>(b)</p>  <p align="center">OR</p> <p>Write the structures and IUPAC names of the cross aldol condensation products only of ethanal and propanal.</p>	<p><b>2</b></p>
<p><b>8.</b></p>	<p>(a) Justify the role of tert-butyl peroxide in the polymerization of ethene.</p> <p>(b) Write the structures of the monomers of the following polymer:</p> $\left[ \text{CH}_2 - \text{CH} = \text{CH} - \text{CH}_2 - \text{CH}_2 - \overset{\text{C}_6\text{H}_5}{\text{CH}} \right]_n$	<p><b>2</b></p>
<p><b>9.</b></p>	<p>Write the mechanism of acid dehydration of ethanol to yield ethane</p>	<p><b>2</b></p>
<p><b>10.</b></p>	<p>For a certain chemical reaction variation in concentration [A] vs. time (s) plot is given below:</p> <p>(i) Predict the order of the given reaction?</p> <p>(ii) What does the slope of the line and intercept indicate?</p> <p>(iii) What is the unit of rate constant k?</p>	

11.	Draw the molecular structures of the following: (a) Noble gas species which is isostructural with $BrO_3^-$ (b) Dibasic oxoacid of phosphorus	2
12.	(i) On the basis of the standard electrode potential values stated for acid solutions, predict whether $Ti^{4+}$ species may be used to oxidise Fe(II) to Fe(III) $Ti^{4+} + e^- \rightarrow Ti^{3+} \quad E^o = +0.01V$ $Fe^{3+} + e^- \rightarrow Fe^{2+} \quad E^o = +0.77V$ (ii) Based on the data arrange $Fe^{2+}$ , $Mn^{2+}$ and $Cr^{2+}$ in the increasing order of stability of +2 oxidation state. (Give a brief reason) $E^o_{Cr^{3+}/Cr^{2+}} = -0.4V$ $E^o_{Mn^{3+}/Mn^{2+}} = +1.5V$ $E^o_{Fe^{3+}/Fe^{2+}} = +0.8V$	2
<b>Section-C</b>		
13.	Niobium crystallises in body-centred cubic structure. If the atomic radius is 143.1 pm, calculate the density of Niobium. (Atomic mass = 93u).	3
14.	Give reasons for the following: a. When 2g of benzoic acid is dissolved in 25 g of benzene, the experimentally determined molar mass is always greater than the true value. b. Mixture of ethanol and acetone shows positive deviation from Raoult's Law. c. The preservation of fruits by adding concentrated sugar solution protects against bacterial action.	3
15.	An alcohol A ( $C_4H_{10}O$ ) on oxidation with acidified potassium dichromate gives acid B ( $C_4H_8O_2$ ). Compound A when dehydrated with conc. $H_2SO_4$ at 443 K gives compound C. Treatment of C with aqueous $H_2SO_4$ gives compound D ( $C_4H_{10}O$ ) which is an isomer of A. Compound D is resistant to oxidation but compound A can be easily oxidised. Identify A, B, C and D. Name the type of isomerism exhibited by A and D	3
16.	Which one of the following compounds will undergo faster hydrolysis reaction by $S_N1$ mechanism? Justify your answer. <div style="text-align: center;">  </div> <div style="text-align: center;">             or <math>CH_3CH_2CH_2Cl</math> </div>	3
<b>OR</b>		
A compound is formed by the substitution of two chlorine atoms for two hydrogen atoms in propane. Write the structures of the isomers possible. Give the IUPAC name of the isomer which can exhibit enantiomerism.		

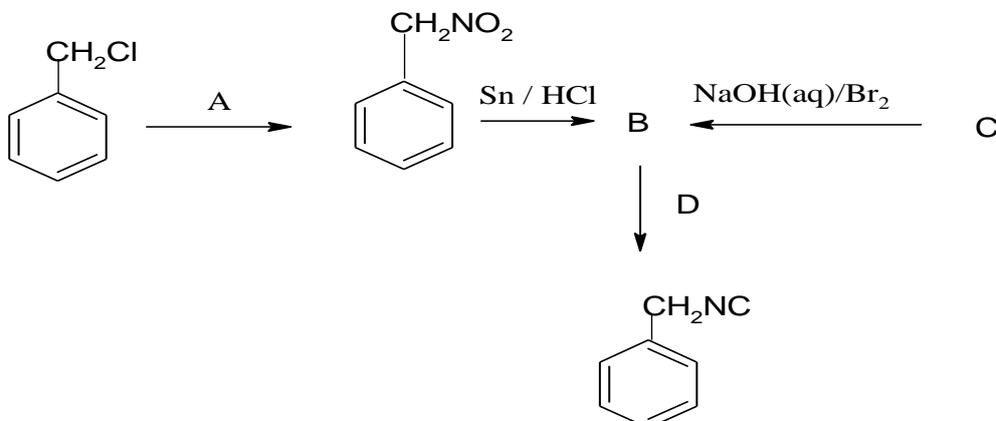
17.	<p>Complete the following reactions :</p> <p>(a)  + H<sub>2</sub>N—OH →</p> <p>(b)  <math>\xrightarrow[\Delta]{\text{KMnO}_4, \text{H}_2\text{SO}_4}</math></p> <p>(c)  + NH<sub>3</sub> <math>\xrightarrow{\text{Strong heating}}</math></p>	3									
18.	<p>Give reasons for the following:</p> <p>(i) Use of aspartame as an artificial sweetener is limited to cold foods.</p> <p>(ii) Metal hydroxides are better alternatives than sodium hydrogen carbonate for treatment of acidity.</p> <p>(iii) Aspirin is used in prevention of heart attacks.</p>	3									
19.	<p>(a) Name the branched chain component of starch.</p> <p>(b) Ribose in RNA and deoxyribose in DNA differ in the structure around which carbon atom?</p> <p>(c) How many peptide linkages are present in a tripeptide?</p> <p style="text-align: center;"><b>OR</b></p> <p>Give three reactions of glucose which cannot be explained by its chain structure</p>	3									
20.	<p>The following data were obtained during the first order thermal decomposition of N<sub>2</sub>O<sub>5</sub>(g) at a constant volume:</p> $2\text{N}_2\text{O}_5(\text{g}) \rightarrow 2\text{N}_2\text{O}_4(\text{g}) + \text{O}_2(\text{g})$ <table border="1"> <thead> <tr> <th>S.No.</th> <th>Time (sec.)</th> <th>Total pressure(atm)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>0</td> <td>0.5</td> </tr> <tr> <td>2.</td> <td>100</td> <td>0.512</td> </tr> </tbody> </table> <p>Calculate the rate constant</p> <p style="text-align: center;"><b>OR</b></p> <p>Two reactions of the same order have equal pre exponential factors but their activation energies differ by 24.9 kJ mol<sup>-1</sup>. Calculate the ratio between the rate constants of these reactions at 27°C. (Gas constant R = 8.314 J K<sup>-1</sup> mol<sup>-1</sup>)</p>	S.No.	Time (sec.)	Total pressure(atm)	1.	0	0.5	2.	100	0.512	3
S.No.	Time (sec.)	Total pressure(atm)									
1.	0	0.5									
2.	100	0.512									

21.	<p>(a) A colloidal sol is prepared by the given method in figure. What is the charge of AgI colloidal particles in the test tube? How is the sol formed, represented?</p>  <p>(b) Explain how the phenomenon of adsorption finds application in Heterogeneous catalysis.</p> <p>(c) Which of the following electrolytes is the most effective for the coagulation of <math>\text{Fe}(\text{OH})_3</math> sol which is a positively charged sol ?  <math>\text{NaCl}</math>, <math>\text{Na}_2\text{SO}_4</math>, <math>\text{Na}_3\text{PO}_4</math></p>	3
22.	<p>Describe how the following steps can be carried out?</p> <p>(a) Recovery of Gold from leached gold metal complex..</p> <p>(b) Conversion of Zirconium iodide to pure Zirconium.</p> <p>(c) Formation of slag in the extraction of copper.</p> <p>(Write the chemical equations also for the reactions involved)</p> <p style="text-align: center;"><b>OR</b></p> <p>Explain the use of the following:</p> <p>a) <math>\text{NaCN}</math> in Froth Floatation Method.</p> <p>b) Carbon monoxide in Mond process.</p> <p>c) Coke in the extraction of Zinc from Zinc Oxide</p>	3
23.	<p>Explain the following:</p> <p>(a) Out of <math>\text{Sc}^{3+}</math>, <math>\text{Co}^{2+}</math> and <math>\text{Cr}^{3+}</math> ions, only <math>\text{Sc}^{3+}</math> is colourless in aqueous solutions.  (Atomic no.: <math>\text{Co} = 27</math>; <math>\text{Sc} = 21</math> and <math>\text{Cr} = 24</math>)</p> <p>(b) The <math>E^\circ_{\text{Cu}^{2+}/\text{Cu}}</math> for copper metal is positive (+0.34), unlike the remaining members of the first transition series</p> <p>(c) <math>\text{La}(\text{OH})_3</math> is more basic than <math>\text{Lu}(\text{OH})_3</math>.</p>	3
24.	<p>A metal complex having composition <math>\text{Cr}(\text{NH}_3)_4\text{Cl}_2\text{Br}</math> has been isolated in two forms <b>A</b> and <b>B</b>. The form <b>A</b> reacts with <math>\text{AgNO}_3</math> to give a white precipitate readily soluble in dilute aqueous ammonia whereas <b>B</b> gives a pale yellow precipitate soluble in concentrated ammonia.</p> <p>(i) Write the formulae of isomers <b>A</b> and <b>B</b>.</p> <p>(ii) State the hybridisation of chromium in each of them.</p> <p>(iii) Calculate the magnetic moment (spin only value) of the isomer <b>A</b></p>	3

**Section-D**

25. (a) Identify A-D

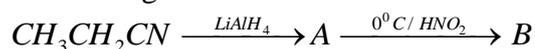
5



(b) Distinguish between the following pair of compounds:

- (i) Aniline and Benzylamine.
- (ii) Methylamine and Dimethylamine.

(c) Complete the following:



**OR**

(a) Account for the following:

- (i) Direct nitration of aniline yields significant amount of meta derivative.
- (ii) Primary aromatic amines cannot be prepared by Gabriel phthalimide synthesis.

(b) Carry out the following conversions:

- (i) Ethanoic acid into methanamine.
- (ii) Aniline to p-Bromoaniline.

(c) Arrange the following in increasing order of basic strength:

Aniline, p-nitroaniline and p-toluidine.

26. (a) A cell is prepared by dipping a zinc rod in 1M zinc sulphate solution and a silver electrode in 1M silver nitrate solution. The standard electrode potential given:

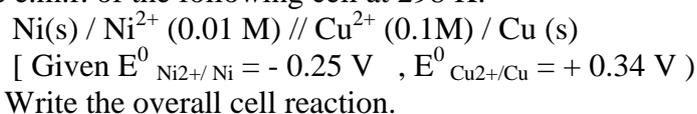
5

$$E^0_{Zn^{2+}/Zn} = -0.76 \text{ V}, E^0_{Ag^+/Ag} = +0.80 \text{ V}$$

What is the effect of increase in concentration of  $Zn^{2+}$  on the  $E_{cell}$ ?

(b) Write the products of electrolysis of aqueous solution of NaCl with platinum electrodes.

(c) Calculate e.m.f. of the following cell at 298 K:



**OR**

(a) Apply Kohlrausch law of independent migration of ions, write the expression to determine the limiting molar conductivity of calcium chloride.

(b) Given are the conductivity and molar conductivity of NaCl solutions at 298K at different concentrations:

Concentration M	Conductivity Scm <sup>-1</sup>	Molar conductivity S cm <sup>2</sup> mol <sup>-1</sup>
0.100	106.74 x 10 <sup>-4</sup>	106.7
0.05	55.53 x 10 <sup>-4</sup>	111.1
0.02	23.15 x 10 <sup>-4</sup>	115.8

Compare the variation of conductivity and molar conductivity of NaCl solutions on dilution. Give reason.

(c) 0.1 M KCl solution offered a resistance of 100 ohms in a conductivity cell at 298 K. If the cell constant of the cell is 1.29 cm<sup>-1</sup>, calculate the molar conductivity of KCl solution.

27. (a) Account for the following observations:

- (i) SF<sub>4</sub> is easily hydrolysed whereas SF<sub>6</sub> is not easily hydrolysed
- (ii) Chlorine water is a powerful bleaching agent.
- (iii) Bi(V) is a stronger oxidising agent than Sb(V)

(b) What happens when

- (i) White phosphorus is heated with concentrated NaOH solution in an inert atmosphere of CO<sub>2</sub>.
- (ii) XeF<sub>6</sub> undergoes partial hydrolysis.  
(Give the chemical equations involved).

**OR**

(a) What inspired N.Bartlett for carrying out reaction between Xe and PtF<sub>6</sub>?

(b) Arrange the following in the order of property indicated against each set:

- (i) F<sub>2</sub>, I<sub>2</sub>, Br<sub>2</sub>, Cl<sub>2</sub> (increasing bond dissociation enthalpy)
- (ii) NH<sub>3</sub>, AsH<sub>3</sub>, SbH<sub>3</sub>, BiH<sub>3</sub>, PH<sub>3</sub> (decreasing base strength)

(c) Complete the following equations:

- (i)  $Cl_2 + NaOH(\text{cold and dilute}) \rightarrow$
- (ii)  $Fe^{3+} + SO_2 + H_2O \rightarrow$

5

**Class XII**  
**Computer Science (083)**  
**Sample Question Paper 2018-19**

**Time allowed: 3 Hours**

**Max. Marks: 70**

**General Instructions:**

- (a) All questions are compulsory.
- (b) Programming Language with C++
- (c) In Question 2(b, d), 3 and 4 has internal choices.

Q. No.	Part	Question Description	Marks
1	(a)	Write the type of C++ Operators (Arithmetic, Logical, and Relational Operators) from the following: (i)       !(ii) !=(iii) &&(iv) %	(2)
	(b)	Observe the following program very carefully and write the name of those header file(s), which are essentially needed to compile and execute the following program successfully: <pre>void main() {     char text[20], newText[20];     gets(text);     strcpy(newText,text);     for(int i=0;i&lt;strlen(text);i++)         if(text[i] == 'A')             text[i] = text[i]+2;     puts(text); }</pre>	(1)
	(c)	Rewrite the following C++ code after removing any/all Syntactical Error(s) with each correction underlined.  <b>Note: Assume all required header files are already being included in the program.</b>  <pre>#define float PI 3.14 void main( ) {     float R=4.5,H=1.5;     A=2*PI*R*H + 2*PIpow(R,2);     cout&lt;&lt;'Area='&lt;&lt;A&lt;&lt;endl; }</pre>	(2)

(d)	<p>Find and write the output of the following C++ program code:  <b>Note: Assume all required header files are already being included in the program.</b></p> <pre> void main( ) {     int Ar[ ] = { 6 , 3 , 8 , 10 , 4 , 6 , 7 } ;     int *Ptr = Ar , I ;     cout&lt;&lt;++*Ptr++ &lt;&lt; '@' ;     I = Ar[3] - Ar[2] ;     cout&lt;&lt;++*(Ptr+I)&lt;&lt; '@' &lt;&lt; "\n" ;     cout&lt;&lt;++I + *Ptr++ &lt;&lt; '@' ;     cout&lt;&lt;*Ptr++ &lt;&lt; '@' &lt;&lt; '\n' ;     for( ; I &gt;= 0 ; I -= 2)         cout&lt;&lt;Ar[I] &lt;&lt; '@' ; } </pre>	(3)
(e)	<p>Find and write the output of the following C++ program code:</p> <pre> typedef char STRING[80]; void MIXNOW(STRING S) {     int Size=strlen(S);     for(int I=0;I&lt;Size;I+=2)     {         char WS=S[I];         S[I]=S[I+1];         S[I+1]=WS;     }     for (I=1;I&lt;Size;I+=2)         if (S[I]&gt;='M' &amp;&amp; S[I]&lt;='U')             S[I]='@'; } void main() {     STRING Word="CBSEEXAM2019";     MIXNOW(Word);     cout&lt;&lt;Word&lt;&lt;endl; } </pre>	(2)
(f)	<p>Observe the following program and find out, which output(s) out of (i) to (iv) will be expected from the program? What will be the minimum and the maximum value assigned to the variable Alter?</p> <p>Note: Assume all required header files are already being included in the program.</p> <pre> void main( ) {     randomize();     int Ar[]={ 10,7}, N; </pre>	(2)

		<pre> int Alter=random(2) + 10 ; for (int C=0;C&lt;2;C++) {     N=random(2) ;     cout&lt;&lt;Ar[N] +Alter&lt;&lt;"#"; } } </pre>	
		<p>(i) 21#20# (iii) 20#17#</p>	<p>(ii) 20#18# (iv) 21#17#</p>
2	(a)	What is a copy constructor? Illustrate with a suitable C++ example.	(2)
	(b)	<p>Write the output of the following C++ code. Also, write the name of feature of Object Oriented Programming used in the following program jointly illustrated by the Function 1 to Function 4.</p> <pre> void My_fun ( ) // Function 1 {     for (int I=1 ; I&lt;=50 ; I++) cout&lt;&lt; "-" ;     cout&lt;&lt;end1 ; } void My_fun (int N) // Function 2 {     for (int I=1 ; I&lt;=N ; I++) cout&lt;&lt;"*" ;     cout&lt;&lt;end1 ; } void My_fun (int A, int B) // Function 3 {     for (int I=1. ;I&lt;=B ;I++) cout &lt;&lt;A*I ;     cout&lt;&lt;end1 ; } void My_fun (char T, int N) // Function 4 {     for (int I=1 ; I&lt;=N ; I++) cout&lt;&lt;T ;     cout&lt;&lt;end1; } void main ( ) {     int X=7, Y=4, Z=3;     char C='#' ;     My_fun (C,Y) ;     My_fun (X,Z) ; } </pre>	(2)
		<b>OR</b>	
		(b) Write any four differences between Constructor and Destructor function with respect to object oriented programming.	

(c)	<p>Define a class Ele_Bill in C++ with the following descriptions:</p> <p><b><u>Private members:</u></b></p> <p>Cname                      of type character array  Pnumber                     of type long  No_of_units                of type integer  Amount                      of type float.  Calc_Amount( )            This member function should calculate the amount as No_of_units*Cost .</p> <p>Amount can be calculated according to the following conditions:</p> <p><b><u>No of units Cost</u></b></p> <table border="0"> <tr> <td>First 50 units</td> <td>Free</td> </tr> <tr> <td>Next 100 units</td> <td>0.80 @ unit</td> </tr> <tr> <td>Next 200 units</td> <td>1.00 @ unit</td> </tr> <tr> <td>Remaining units</td> <td>1.20 @ unit</td> </tr> </table> <p><b><u>Public members:</u></b></p> <ul style="list-style-type: none"> <li>* A function Accept( ) which allows user to enter Cname, Pnumber, No_of_units and invoke function Calc_Amount().</li> <li>* A function Display( ) to display the values of all the data members on the screen.</li> </ul>	First 50 units	Free	Next 100 units	0.80 @ unit	Next 200 units	1.00 @ unit	Remaining units	1.20 @ unit	(4)
First 50 units	Free									
Next 100 units	0.80 @ unit									
Next 200 units	1.00 @ unit									
Remaining units	1.20 @ unit									
(d)	<p>Answer the questions (i) to (iv) based on the following:</p> <pre> class Faculty {     int FCode; protected:     char FName[20]; public:     Faculty();     void Enter();     void Show(); }; class Programme {     int PID; protected:     char Title[30]; public:     Programme();     void Commence();     void View(); }; class Schedule: public Programme, Faculty {     int DD,MM,YYYY; public: </pre>	(4)								

	<pre> Schedule(); void Start(); void View(); }; void main() {     Schedule S;           //Statement 1     _____          //Statement 2 } </pre>
(i)	Write the names of all the member functions, which are directly accessible by the object S of class Schedule as declared in main() function.
(ii)	Write the names of all the members, which are directly accessible by the memberfunction Start( ) of class Schedule.
(iii)	Write Statement 2 to call function View( ) of class Programme from the object S of class Schedule.
(iv)	What will be the order of execution of the constructors, when the object S of class Schedule is declared inside main()?
<b>OR</b>	
(d)	<p>Consider the following class State :</p> <pre> class State { protected : int tp; public : State() { tp=0;} void inctp() { tp++;}; int gettp(); { return tp; } }; </pre> <p>Write a code in C++ to publically derive another class ‘District’ with the following additional members derived in the public visibility mode.</p> <p><u>Data Members :</u>  Dname            string  Distance        float  Population      long int</p> <p><u>Member functions :</u>  DINPUT( ) : To enter Dname, Distance and population  DOUTPUT( ) : To display the data members on the screen.</p>

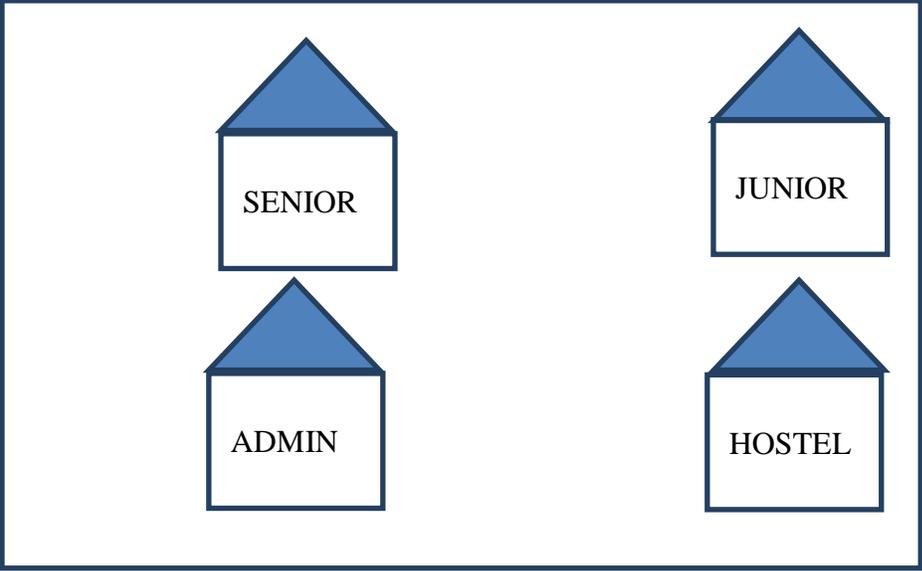
3	(a)	<p>Write a user-defined function <code>AddEnd4(int A[][4],int R,int C)</code> in C++ to find and display the sum of all the values, which are ending with 4 (i.e., unit place is 4). For example if the content of array is:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>24</td> <td>16</td> <td>14</td> </tr> <tr> <td>19</td> <td>5</td> <td>4</td> </tr> </table> <p>The output should be 42</p>	24	16	14	19	5	4	(2)
	24	16	14						
	19	5	4						
	<b>OR</b>								
(a)	Write a user defined function in C++ to find the sum of both left and right diagonal elements from a two dimensional array.								
(b)	<p>Write a user-defined function <code>EXTRA_ELE(int A[ ], int B[ ], int N)</code> in C++ to find and display the extra element in Array A. Array A contains all the elements of array B but one more element extra. (Restriction: array elements are not in order)</p> <p>Example      If the elements of Array A is 14, 21, 5, 19, 8, 4, 23, 11 and the elements of Array B is 23, 8, 19, 4, 14, 11, 5 Then output will be 21</p>	(3)							
<b>OR</b>									
(b)	<p>Write a user defined function <code>Reverse(int A[],int n)</code> which accepts an integer array and its size as arguments(parameters) and reverse the array. Example : if the array is 10,20,30,40,50 then reversed array is 50,40,30,20,10</p>								
(c)	An array <code>S[10][30]</code> is stored in the memory along the column with each of its element occupying 2 bytes. Find out the memory location of <code>S[5][10]</code> , if element <code>S[2][15]</code> is stored at the location 8200.	(3)							
<b>OR</b>									
(c)	An array <code>A[30][10]</code> is stored in the memory with each element requiring 4 bytes of storage ,if the base address of A is 4500 ,Find out memory locations of <code>A[12][8]</code> , if the content is stored along the row.								
(d)	<p>Write the definition of a member function <code>Ins_Player()</code> for a class <code>CQUEUE</code> in C++, to add a Player in a statically allocated circular queue of <code>PLAYERS</code> considering the following code is already written as a part of the program:</p> <pre>struct Player {     long Pid;     char Pname[20];</pre>	(4)							

	<pre> }; const int size=10; class CQUEUE {     Player Ar[size];     int Front, Rear; public:     CQUEUE()     {         Front = -1;         Rear = -1;     }     void Ins_Player(); // To add player in a static circular queue     void Del_Player(); // To remove player from a static circular queue     void Show_Player(); // To display static circular queue }; </pre>	
	<b>OR</b>	
	<p>(d) Write a function in C++ to delete a node containing Books information ,from a dynamically allocated stack of Books implemented with the help of the following structure:</p> <pre> struct Book {     int BNo;     char BName[20];     Book *Next; }; </pre>	
	<p>(e) Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion.</p> <p style="text-align: center;">A/B+C*(D-E)</p>	(2)
	<b>OR</b>	
	<p>Evaluate the following Postfix expression :</p> <p>4,10,5,+,* ,15,3,/,-</p>	
4	<p>(a) Write a function RevText() to read a text file “ Input.txt “ and Print only word starting with ‘I’ in reverse order .</p> <p><b>Example: If value in text file is: INDIA IS MY COUNTRY</b></p> <p><b>Output will be: AIDNI SI MY COUNTRY</b></p>	(2)
	<b>OR</b>	
	<p>(a) Write a function in C++ to count the number of lowercase alphabets present in a text file “BOOK..txt”.</p>	

(b)	<p>Write a function in C++ to search and display details, whose destination is "Cochin" from binary file "Bus.Dat". Assuming the binary file is containing the objects of the following class:</p> <pre>class BUS {     int Bno;           // Bus Number     char From[20];    // Bus Starting Point     char To[20];      // Bus Destination public:     char * StartFrom ( ); { return From; }     char * EndTo( ); { return To; }     void input() { cin&gt;&gt;Bno&gt;&gt;; gets(From); get(To); }     void show( ) { cout&lt;&lt;Bno&lt;&lt; ":"&lt;&lt;From &lt;&lt; ":" &lt;&lt;To&lt;&lt;endl; } };</pre>	(3)
<b>OR</b>		
(b)	<p>Write a function in C++ to add more new objects at the bottom of a binary file "STUDENT.dat", assuming the binary file is containing the objects of the following class :</p> <pre>class STU {     int Rno;     char Sname[20]; public: void Enter() {     cin&gt;&gt;Rno;gets(Sname); } void show() {     cout &lt;&lt; Rno&lt;&lt;sname&lt;&lt;endl; } };</pre>	
(c)	<p>Find the output of the following C++ code considering that the binary file PRODUCT.DAT exists on the hard disk with a list of data of 500 products.</p> <pre>class PRODUCT {     int PCode;char PName[20]; public:     void Entry();void Disp(); }; void main() {     fstream In;     In.open("PRODUCT.DAT",ios::binary ios::in);     PRODUCT P;     In.seekg(0,ios::end);     cout&lt;&lt;"Total Count: "&lt;&lt;In.tellg()/sizeof(P)&lt;&lt;endl;</pre>	(1)

		<pre> In.seekg(70*sizeof(P)); In.read((char*)&amp;P, sizeof(P)); In.read((char*)&amp;P, sizeof(P)); cout&lt;&lt;"At Product:"&lt;&lt;In.tellg()/sizeof(P) + 1; In.close(); } </pre>																																																																							
		<b>OR</b>																																																																							
	(c)	Which file stream is required for seekg() ?																																																																							
5	(a)	<p>Observe the following table and answer the parts(i) and(ii) accordingly</p> <p><b>Table:Product</b></p> <table border="1"> <thead> <tr> <th>Pno</th> <th>Name</th> <th>Qty</th> <th>PurchaseDate</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Pen</td> <td>102</td> <td>12-12-2011</td> </tr> <tr> <td>102</td> <td>Pencil</td> <td>201</td> <td>21-02-2013</td> </tr> <tr> <td>103</td> <td>Eraser</td> <td>90</td> <td>09-08-2010</td> </tr> <tr> <td>109</td> <td>Sharpener</td> <td>90</td> <td>31-08-2012</td> </tr> <tr> <td>113</td> <td>Clips</td> <td>900</td> <td>12-12-2011</td> </tr> </tbody> </table>	Pno	Name	Qty	PurchaseDate	101	Pen	102	12-12-2011	102	Pencil	201	21-02-2013	103	Eraser	90	09-08-2010	109	Sharpener	90	31-08-2012	113	Clips	900	12-12-2011	(2)																																														
Pno	Name	Qty	PurchaseDate																																																																						
101	Pen	102	12-12-2011																																																																						
102	Pencil	201	21-02-2013																																																																						
103	Eraser	90	09-08-2010																																																																						
109	Sharpener	90	31-08-2012																																																																						
113	Clips	900	12-12-2011																																																																						
	(i)	Write the names of most appropriate columns, which can be considered as candidate keys.																																																																							
	(ii)	What is the degree and cardinality of the above table?																																																																							
	(b)	<p>Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables.</p> <p style="text-align: center;"><b>TRAINER</b></p> <table border="1"> <thead> <tr> <th>TID</th> <th>TNAME</th> <th>CITY</th> <th>HIREDATE</th> <th>SALARY</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>SUNAINA</td> <td>MUMBAI</td> <td>1998-10-15</td> <td>90000</td> </tr> <tr> <td>102</td> <td>ANAMIKA</td> <td>DELHI</td> <td>1994-12-24</td> <td>80000</td> </tr> <tr> <td>103</td> <td>DEEPTI</td> <td>CHANDIGARG</td> <td>2001-12-21</td> <td>82000</td> </tr> <tr> <td>104</td> <td>MEENAKSHI</td> <td>DELHI</td> <td>2002-12-25</td> <td>78000</td> </tr> <tr> <td>105</td> <td>RICHA</td> <td>MUMBAI</td> <td>1996-01-12</td> <td>95000</td> </tr> <tr> <td>106</td> <td>MANIPRABHA</td> <td>CHENNAI</td> <td>2001-12-12</td> <td>69000</td> </tr> </tbody> </table> <p style="text-align: center;"><b>COURSE</b></p> <table border="1"> <thead> <tr> <th>CID</th> <th>CNAME</th> <th>FEES</th> <th>STARTDATE</th> <th>TID</th> </tr> </thead> <tbody> <tr> <td>C201</td> <td>AGDCA</td> <td>12000</td> <td>2018-07-02</td> <td>101</td> </tr> <tr> <td>C202</td> <td>ADCA</td> <td>15000</td> <td>2018-07-15</td> <td>103</td> </tr> <tr> <td>C203</td> <td>DCA</td> <td>10000</td> <td>2018-10-01</td> <td>102</td> </tr> <tr> <td>C204</td> <td>DDTP</td> <td>9000</td> <td>2018-09-15</td> <td>104</td> </tr> <tr> <td>C205</td> <td>DHN</td> <td>20000</td> <td>2018-08-01</td> <td>101</td> </tr> <tr> <td>C206</td> <td>O LEVEL</td> <td>18000</td> <td>2018-07-25</td> <td>105</td> </tr> </tbody> </table>	TID	TNAME	CITY	HIREDATE	SALARY	101	SUNAINA	MUMBAI	1998-10-15	90000	102	ANAMIKA	DELHI	1994-12-24	80000	103	DEEPTI	CHANDIGARG	2001-12-21	82000	104	MEENAKSHI	DELHI	2002-12-25	78000	105	RICHA	MUMBAI	1996-01-12	95000	106	MANIPRABHA	CHENNAI	2001-12-12	69000	CID	CNAME	FEES	STARTDATE	TID	C201	AGDCA	12000	2018-07-02	101	C202	ADCA	15000	2018-07-15	103	C203	DCA	10000	2018-10-01	102	C204	DDTP	9000	2018-09-15	104	C205	DHN	20000	2018-08-01	101	C206	O LEVEL	18000	2018-07-25	105	(4+2)
TID	TNAME	CITY	HIREDATE	SALARY																																																																					
101	SUNAINA	MUMBAI	1998-10-15	90000																																																																					
102	ANAMIKA	DELHI	1994-12-24	80000																																																																					
103	DEEPTI	CHANDIGARG	2001-12-21	82000																																																																					
104	MEENAKSHI	DELHI	2002-12-25	78000																																																																					
105	RICHA	MUMBAI	1996-01-12	95000																																																																					
106	MANIPRABHA	CHENNAI	2001-12-12	69000																																																																					
CID	CNAME	FEES	STARTDATE	TID																																																																					
C201	AGDCA	12000	2018-07-02	101																																																																					
C202	ADCA	15000	2018-07-15	103																																																																					
C203	DCA	10000	2018-10-01	102																																																																					
C204	DDTP	9000	2018-09-15	104																																																																					
C205	DHN	20000	2018-08-01	101																																																																					
C206	O LEVEL	18000	2018-07-25	105																																																																					

	(i)	Display the Trainer Name, City & Salary in descending order of their Hiredate.																																					
	(ii)	To display the TNAME and CITY of Trainer who joined the Institute in the month of December 2001.																																					
	(iii)	To display TNAME, HIREDATE, CNAME, STARTDATE from tables TRAINER and COURSE of all those courses whose FEES is less than or equal to 10000.																																					
	(iv)	To display number of Trainers from each city.																																					
	(v)	SELECT TID, TNAME, FROM TRAINER WHERE CITY NOT IN('DELHI', 'MUMBAI');																																					
	(vi)	SELECT DISTINCT TID FROM COURSE;																																					
	(vii)	SELECT TID, COUNT(*), MIN(FEES) FROM COURSE GROUP BY TID HAVING COUNT(*)>1;																																					
	(viii)	SELECT COUNT(*), SUM(FEES) FROM COURSE WHERE STARTDATE< '2018-09-15';																																					
6	(a)	State any one Distributive Law of Boolean Algebra and Verify it using truth table.	(2)																																				
	(b)	Draw the Logic Circuit of the following Boolean Expression: $((U + V).(U + W)). (V + W')$	(2)																																				
	(c)	Derive a Canonical SOP expression for a Boolean function F(X,Y,Z) represented by the following truth table: <table border="1"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> <th>F(X,Y,Z)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	X	Y	Z	F(X,Y,Z)	0	0	0	1	0	0	1	1	0	1	0	0	0	1	1	0	1	0	0	1	1	0	1	0	1	1	0	0	1	1	1	1	(1)
X	Y	Z	F(X,Y,Z)																																				
0	0	0	1																																				
0	0	1	1																																				
0	1	0	0																																				
0	1	1	0																																				
1	0	0	1																																				
1	0	1	0																																				
1	1	0	0																																				
1	1	1	1																																				
	(d)	Reduce the following Boolean Expression to its simplest form using K-Map: <b>F(X,Y,Z,W)= <math>\Sigma (0,1,2,3,4,5,8,10,11,14)</math></b>	(3)																																				

7	(a)	Arun opened his e-mail and found that his inbox was full of hundreds of unwanted mails. It took him around two hours to delete these unwanted mails and find the relevant ones in his inbox. What may be the cause of his receiving so many unsolicited mails? What can Arun do to prevent this happening in future?	(2)
	(b)	Assume that 50 employees are working in an organization. Each employee has been allotted a separate workstation to work. In this way, all computers are connected through the server and all these workstations are distributed over two floors. In each floor, all the computers are connected to a switch. Identify the type of network?	(1)
	(c)	Your friend wishes to install a wireless network in his office. Explain him the difference between guided and unguided media.	(1)
	(d)	Write the expanded names for the following abbreviated terms used in Networking and Communications: (i) CDMA (ii) HTTP (iii) XML (iv) URL	(2)
	(e)	<p>Multipurpose Public School, Bangluru is Setting up the network between its Different Wings of school campus. There are 4 wings named as SENIOR(S), JUNIOR(J), ADMIN(A) and HOSTEL(H).</p> <p>Multipurpose Public School, Bangluru</p> 	(4)

Distance between various wings are given below:

WingAtoWingS	100m
WingAtoWingJ	200m
WingAtoWingH	400m
WingStoWingJ	300m
WingStoWingH	100m
WingJtoWingH	450m

Number of Computers installed at various wings are as follows:

<u>Wings</u>	<u>NumberofComputers</u>
WingA	20
WingS	150
WingJ	50
WingH	25

- (i) Suggest the best wired medium and draw the cable layout to efficiently connect various wings of Multipurpose Public School, Bangluru.
- (ii) Name the most suitable wing where the Servers should be installed. Justify your answer.
- (iii) Suggest a device/software and its placement that would provide data security for the entire network of the School.
- (iv) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphone/laptop users in the campus of Multipurpose Public School, Bangluru.

**Class XII**  
**English Core (301)**  
**Sample Question Paper 2018-19**

**Time allowed: 3 hrs.**

**Max. Marks: 100**

**General Instructions:**

- 1. This paper is divided into three sections: A, B and C.**
- 2. All the sections are compulsory.**
- 3. Read the instructions very carefully given with each section and question and follow them faithfully.**
- 4. Do not exceed the prescribed word limit while answering the questions.**

**SECTION-A (READING)**

**Q1. Read the passage and on the basis of your understanding of the passage answer the questions given below: (20)**

1. India has never subscribed to the doctrine of militarism and war in her history. Here war was never treated as an ideal. It was only tolerated as unavoidable and inevitable, and all attempts were made to check it and bring it under control. In spite of the frequency of wars in ancient India, in spite of highly developed military organization, techniques of war and imperialism, and in spite of the open justification of war as national policy, the heart of India loved pacifism as an ideal capable of realization. India's symbolic role was that of a peacemaker and it sincerely pinned its faith on the principle of 'Live and let live'. At least philosophically, India's intelligence supported the cause of peace not only in national affairs but in international affairs also. All the great seers of the yore visualized the unity of life, permeating all beings, animate or inanimate, which ruled out killing and suicidal wars.
2. This doctrine of philosophical pacifism was practiced by ancient *Aryans* is, no doubt, a question of controversial nature. Certainly, the great Indian teachers and *savants* stuck to this doctrine tenaciously and in their personal life they translated it into practice and preached it to masses and even to princes of military classes.
3. Another culture of those times, the existence of which has been proved by the excavations of *Mohenjo-Daro*, also enunciated the doctrine of pacifism and friendship to all. Strangely enough, the Indus Valley civilization has revealed no fortification and very few weapons.
4. Ahimsa or the doctrine of non-violence in thought, speech and action assumed a gigantic importance in the Buddhist and Jain period. By a constant practice of this virtue, man becomes unassailable by even wild beasts, who forgot their ferocity the moment they entered the circumference of his magnetic influence. The monks and nuns of these churches were apostles of peace, who reached every nook and corner of the world and delivered the message of love to war-weary humanity. The greatest votary was the royal monk *Ashoka*, who in reality was responsible for transforming Ahimsa as an act of personal virtue, to Ahimsa as an act of national virtue.

5. Many a historian recounting the causes of the downfall of the *Mauryas*, hold the pacific policy of *Ashoka* which had eschewed the aggressive militarism of his predecessors, responsible for an early decay of the military strength of the state and its consequent disintegration, leading to the rise of *Sungas*, *Kanvas* and *Andhras*. But, in reality the fault lies with the weak successors of *Ashoka*, who could not wield the weapon of non-violence with a skill and efficiency which required the strength of a spiritual giant like *Ashoka*. They failed due to their subjective weakness: Pacifism itself was no cause of their failure.
6. Besides the foregoing philosophical and religious school of thought, even many political authorities gave their unqualified support to the cause of pacifisms. They recognized the right of rivals to exist, not mainly as enemies, but as collaborators in the building of a civilization operation. Thus, for centuries, in the pre-*Mauryan* India, scores of small independent republics existed and flourished without coming in clash with each other.
7. With regard to *Kautilya*, the much maligned militarist and the so called Machiavelli of India, He thinks that the object of diplomacy is to avoid war.
8. The Mahabharata observes in the connection, “A wise man should be content with what can be obtained by the expedients of conciliation, gift and dissention.” It denounces the warring world of men by comparing it to a dog-kennel. “First there comes the wagging of tails, then turning of one round to other, then the show of teeth, then the roaring and then comes the commencement of the fights. It is the same with men; there is no difference whatever.” *Yajnavalkya* adds: ‘War is the last expedient to be used when all others have failed.’ Likewise, *Sri Krishna* who’s *Bhagwad-Gita* has been styled by some as ‘a song of the battle’, should not be considered out and out militarist. When all the three expedients were exhausted, then alone the fourth was resorted to.
9. All possible avenues of peace such as negotiation, conciliation through conference, meditation and so on, were explored before the war was resorted to. This proves that the heart of ancient India was sound and it longed for peace, although war also was not treated as an anathema, which was to be avoided as far as possible. (Words– 737)

(Extract from ‘Culture India-Pacifism has been the Ideal’ by Sri Indra)

**1.1 Answer each of the questions given below by choosing the most appropriate option: (1X5=5)**

- (i) The heart of India loved \_\_\_\_\_
  - a) a highly developed military organization
  - b) techniques of wars and imperialism
  - c) loans
  - d) pacifism
- (ii) Principle of ‘Live and let live’ means
  - a) imperialism
  - b) militarism
  - c) frequency of wars among nations
  - d) role of peace makers

- (iii) Aryans preached and practiced this to the masses
- non-violence
  - freedom of speech and action
  - philosophical pacifisms
  - practice of military organization
- (iv) Mahabharata compares the warring world with
- wise men
  - dog kennel
  - song of the battle
  - militarist
- (v) Unearthing *Mohan-jo-Daro* reinforced the following of Pacifism
- there was no fortification and very few weapons
  - they delivered the message of love
  - they were apostles of peace
  - thinks that the object of diplomacy is to avoid war

**1.2 Answer the following questions briefly:**

**(1X6=6)**

- How was war treated in India?
- Describe India's preparedness for war in spite of their belief in Pacifism.
- How did the Aryans practice the Doctrine of Pacifism?
- What is Ahimsa?
- What is the meaning of co-existence with rivals?
- Why should Bhagvad-Gita not be considered as "A song of the battle"?

**1.3 Answer any three of the following questions in 25-30 words:**

**(2X3=6)**

- What kind of unity did all the seers visualize?
- By some, Ashoka was considered as the cause of the downfall of the Mauryas. Do you agree? Give reasons for your answer.
- Which options were explored by Sri Krishna before resorting to war?
- Throw some light on the thinking of Kautilya regarding war.

**1.4 Pick out the words/phrases from the passage which are similar in meaning to the following:**

**(1X3=3)**

- express in definite and clear terms (para 3)
- defensive wall (para 3)
- the beginning (para 8)

**Q 2. Read the passage and answer the questions given below:**

**(10)**

1. There is a clear dichotomy between *Jayashankar Prasad's* daily life and the one that found expression in his literature. In his literary formulations, *Prasad* advocated an escape- from- personality ideal and categorically stated: "An artist's art, and not his person, is the touchstone to assess his work . . . it is only after losing his personality that he emerges in his art as an artist".
2. In *Prasad's* works – his poems, short stories, novels, dramas etc. – what emerges is life as shaped in the writer's inner self by his emotions, fancies, dreams, reveries . . . His writings are a record not of outer reality, but of the artist's inner world. As such, of a proper appreciation and understanding of his works more emphasis needs to be placed on the working of his mind, than the events of his day- to- day life.
3. Prasad was born in a renowned family of *Varansi*. His grand- father *Shiv Ratan Sahu*, a dealer in high quality perfumed tobacco (snuff). Besides being an astute businessman, he was endowed with a marked cultural taste. His home was the meeting place of the local poets, singers, artists, scholars and men of religion. Prasad's father *Devi Prasad Sahu* carried forward this high tradition of family. *Prasad*, therefore, had a chance to study the various phases of human nature in the light of the business traditions, artistic taste and religious background of his family.
4. When the business had somewhat recovered, *Prasad* planned the publication of a literary journal. Prasad started the "Indu". The inaugural number appeared in July 1909. By this time Prasad's notions of literature had crystalized into a credo. In the first issue of *Indu*, he proclaimed, 'Literature has no fixed aim; it is not slave to rules; it is free and all-embracing genius, gives birth to genuine literature which is subservient to none. Whatever in the world is true and beautiful is its subject matter. By the dealing with the True and Beautiful it establishes the one and affects the full flowering of the others. Its force can be measured by the degree of pleasure it gives to the reader's mind as also by criticism which is free of all prejudice". The words sound like the manifesto of romanticism in literature.
5. Even while recognizing the social relevance of literature, *Prasad* insisted, "The poet is a creator . . . he is not conditioned by his milieu; rather it is he who moulds it and gives it a new shape; he conjures up a new world of beauty where the reader for the time being, becomes oblivious of the outer world and passes his time in an eternal spring garden where golden lotuses blossom and the air is thick and pollen". Thus, the chief aim of literature according to Prasad is to give joy to the reader and to create a state of bliss in him. Later under the impact of *Shaivadvaitism*, this faith of *Prasad* got further strengthened.

**(word length- 490)**

*(Extract from 'Jayashankar Prasad- His mind and Art' by Dr. Nagendra)*

- 2.1 On the basis of your understanding of the above passage, make notes on it using headings and sub- headings. Use recognizable abbreviations (wherever necessary- minimum four) and a format you consider suitable. Also supply an appropriate title to it. **(5)**
- 2.2 Write a summary of the passage in about 100 words. **(5)**

### SECTION: B (ADVANCED WRITING SKILLS)

**Q.3** You are Simar / Smriti of Lotus International School, Jodhpur. Your school is organizing a workshop on 'Prevention of Drug Abuse' in the coming week. Prepare a poster with complete information for the students of class X-XII. (4)

**OR**

You are Simar / Smriti of Lotus International School, Jodhpur. Your school has decided to contribute in controlling traffic near your school and requires the names of volunteers from IX to XII. Write a notice to be displayed on the notice board. (50 words) (4)

**Q.4** Public demonstration causes a lot of disturbance in daily routine of common man. You almost missed your important entrance examination as people blocked the highway. As Tarun / Taruna, a student aspiring to be a doctor, write a letter to the Editor of The Times of India highlighting the need to discourage such demonstrations and disturbance by public on highways which cause a great loss of time and opportunity for many. (100-125 words) (6)

**OR**

You are Tarun / Taruna who bought a new Luminous Inverter for your home from R.K. Electronics, Noida but found many functional problems as the charging is not done properly and battery water is getting leaked. Write a letter of complaint to the proprietor to take care of the same. (100-125 words) (6)

**Q.5** You are Mukul / Mahima of Alps Public School. Your school has organized a debate on 'Social Media and It's Effects' and you will be participating from your school. Prepare your views against or in favour of the motion. (150-200 words) (10)

**OR**

As Mukul / Mahima of Alps Public School, write a speech to be delivered in school assembly highlighting the importance of cleanliness suggesting that the state of cleanliness reflects the character of its citizens. (150-200 words) (10)

**Q.6** By 2050, India will be amongst the countries which will face acute water shortage. You are highly alarmed and terrified of the future world without water. So, write an article on 'Save water- are we doing enough?' for the local daily in 150-200 words. (10)

**OR**

You are Karan / Kirti of L.M. Memorial Public School, Dwarka. Your school has adopted a village as a social responsibility. Students are being taken to teach the children of that village on a regular basis. Write a report, for your school magazine, on the various other programmes organized there in 150-200 words. (10)

**SECTION: C**

**(LITERATURE: TEXT BOOKS and LONG READING TEXT)**

**Q7. Read the following extract and answer the following questions briefly:**

What I want should not be confused  
with total inactivity.  
Life is what it is about;  
I want no truck with death.

- (i) Name the poem and the poet of the above stanza.
- (ii) What does the poet mean by 'inactivity'?
- (iii) Explain what life is all about, according to the poet?
- (iv) What is the ultimate expectation of the poet from all human beings? (1X4=4)

**OR**

When aunt is dead, her terrified hands will lie  
Still ringed with ordeals she was mastered by.  
The tigers in the panel that she made  
Will go on prancing, proud and unafraid.

- (i) Name the poem and the poet of the above stanza.
- (ii) What lies in store for the Aunt?
- (iii) Explain 'ringed with ordeals'.
- (iv) Identify and name the poetic device used in the last line of the above stanza. (1X4=4)

**Q8. Answer any four the following questions in 30-40 words:** (3X4=12)

- (i) "We've all a great deal to reproach ourselves with" said M.Hamel. Refer to the context and explain what he wanted to convey to his students.
- (ii) Why was Edla happy to see the gift left by the peddler?
- (iii) When Gandhi got the whole hearted support of the lawyers, he said, 'The battle of Champaran is won'. What was the essence behind his statement?
- (iv) Did the prophecy of the astrologer come true at the end of the story? How?
- (v) What were the indignities that Zitkala-Sa had to suffer for being from a marginalized community?
- (vi) What story did Jo want to hear the next day and why? What was father's reaction to it?

**Q 9. Answer any one of the following questions in 120-125 words:** (6)

- (i) Mukesh is not like the others. His 'dreams loom like a mirage amidst the dust of streets that fill his town Firozabad'. Justify the statement in the light of contrast in the mindsets of Mukesh and the people of Firozabad.
- (ii) Unrealistic dreams often lead to a great deal of unhappiness. Justify the statement on the basis of the story 'Going Places'.
- (iii) The childhood experience of terror of Douglas made him stronger and more determined. Elucidate the above statement supporting it with evidences from the text.

**Q10. Answer any one of the following questions in about 120-150 words: (6)**

- (i) The servants of Sadao and Hana reflect a particular mindset of the general public in society towards the thinking and broad minded human beings. Elaborate with the help of the story ‘The Enemy’.
- (ii) Optimism in one’s attitude helps deal with all the challenges in life. Prove the statement by referring to the character Mr. Lamb from the chapter ‘On the Face of It’.
- (iii) Give a detailed account of the preparations made by the Governor for Evans James to write his examination.

**Q11. Answer any one the following questions in about 120-150 words: (6)**

- (i) ‘I do not agree to this. Why dream of playing a game against the race. How can you hope to gain happiness? Do not be a lone wolf. Publish your results, take the world-take the nation at least-into your confidence’, said Dr. Kemp. These words sum up, to a large extent, the downfall of a genius like Griffin. Elucidate from the novel ‘The Invisible Man’.
- (ii) Mr. Hall is a carefree man as he has a typical working life-partner in Mrs. Hall. Such persons are found in every society. Give a peep into both their characters. (The Invisible Man)
- (iii) How are the weavers treated differently from the farmers by the locals of Raveloe? (Silas Marner)
- (iv) Describe in your own words, the village of Raveloe. List some of the differences between Raveloe and Lanter Yard.

**Q12. Answer any one of the following questions in about 120-150 words: (6)**

- (i) The unveiling of the stranger was as unplanned and sudden for himself as for the people of Iping. Explain the reason, incident and consequence of his unveiling.
- (ii) Describe and analyse the contribution of rustic characters in the development of plot of the novel, ‘The Invisible Man’.
- (iii) What is the significance of Gold in the novel, ‘Silas Marner’.
- (iv) In the war between love and luxury, love has priority. Justify on the basis of Silas Marner.

\*\*\*\*\*

## MATHEMATICS

**Time allowed : 3 hours**

**Maximum Marks: 100**

### General Instructions:

1. All questions are compulsory.
2. This question paper contains 29 questions.
3. Questions 1 – 4 in Section A are very short-answer type questions carrying 1 mark each.
4. Questions 5 – 12 in Section B are short-answer type questions carrying 2 marks each.
5. Questions 13 – 23 in Section C are long-answer I type questions carrying 4 marks each.
6. Questions 24 – 29 in Section D are long-answer II type questions carrying 6 marks each.

### Section A

1. If A and B are invertible matrices of order 3,  $|A| = 2$  and  $|(AB)^{-1}| = -\frac{1}{6}$ . Find  $|B|$ .
2. Differentiate  $\sin^2(x^2)$  w.r.t  $x^2$ .
3. Write the order of the differential equation:

$$\log\left(\frac{d^2y}{dx^2}\right) = \left(\frac{dy}{dx}\right)^3 + x$$

4. Find the acute angle which the line with direction cosines  $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{6}}, n$  makes with positive direction of z-axis.

OR

Find the direction cosines of the line:  $\frac{x-1}{2} = -y = \frac{z+1}{2}$

### Section B

5. Let  $A = Z \times Z$  and  $*$  be a binary operation on A defined by  $(a, b)*(c, d) = (ad + bc, bd)$ .

Find the identity element for  $*$  in the set A.

6. If  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$  and  $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ , find k so that  $A^2 = 5A + kI$ .

7. Find :  $\int \frac{(x^2 + \sin^2 x) \sec^2 x}{1 + x^2} dx$

8. Find:  $\int \frac{e^x (x-3)}{(x-1)^3} dx$

OR

Find:  $\int \frac{(x^4 - x)^{\frac{1}{4}}}{x^5} dx$

9. Form the differential equation of all circles which touch the x-axis at the origin.

10. Find the area of the parallelogram whose diagonals are represented by the vectors

$$\vec{a} = 2\hat{i} - 3\hat{j} + 4\hat{k} \text{ and } \vec{b} = 2\hat{i} - \hat{j} + 2\hat{k}$$

OR

Find the angle between the vectors

$$\vec{a} = \hat{i} + \hat{j} - \hat{k} \text{ and } \vec{b} = \hat{i} - \hat{j} + \hat{k}$$

11. If A and B are two independent events, prove that A' and B are also independent.

12. One bag contains 3 red and 5 black balls. Another bag contains 6 red and 4 black balls. A ball is transferred from first bag to the second bag and then a ball is drawn from the second bag. Find the probability that the ball drawn is red.

OR

If  $P(A) = 0.6$ ,  $P(B) = 0.5$  and  $P(A|B) = 0.3$ , then find  $P(A \cup B)$ .

### Section C

13. Prove that the function  $f: [0, \infty) \rightarrow \mathbf{R}$  given by  $f(x) = 9x^2 + 6x - 5$  is not invertible. Modify the codomain of the function f to make it invertible, and hence find  $f^{-1}$ .

OR

Check whether the relation R in the set  $\mathbf{R}$  of real numbers, defined by

$R = \{(a, b) : 1 + ab > 0\}$ , is reflexive, symmetric or transitive.

14. Find the value of :  $\sin\left(2 \tan^{-1} \frac{1}{4}\right) + \cos(\tan^{-1} 2\sqrt{2})$

15. Using properties of determinants, prove that:

$$\begin{vmatrix} a & b-c & c+b \\ a+c & b & c-a \\ a-b & b+a & c \end{vmatrix} = (a+b+c)(a^2+b^2+c^2)$$

16. If  $y = x^{\sin x} + \sin(x^x)$ , find  $\frac{dy}{dx}$

OR

If  $y = \log(1+2t^2+t^4)$ ,  $x = \tan^{-1} t$ , find  $\frac{d^2y}{dx^2}$

17. If  $y = \cos(m \cos^{-1} x)$

Show that:  $(1-x^2) \frac{d^2y}{dx^2} - x \frac{dy}{dx} + m^2y = 0$

18. Find the equations of the normal to the curve  $y = 4x^3 - 3x + 5$  which are perpendicular to the line  $9x - y + 5 = 0$ .

19. Find:  $\int \frac{x^4+1}{x(x^2+1)^2} dx$

20. Evaluate:  $\int_{-1}^1 \frac{x+|x|+1}{x^2+2|x|+1} dx$

21. Find the particular solution of the following differential equation.

$$\cos y dx + (1 + 2e^{-x}) \sin y dy = 0; y(0) = \frac{\pi}{4}$$

OR

Find the general solution of the differential equation:

$$\frac{dx}{dy} = \frac{y \tan y - x \tan y - xy}{y \tan y}$$

22. If  $\vec{p} = \hat{i} + \hat{j} + \hat{k}$  and  $\vec{q} = \hat{i} - 2\hat{j} + \hat{k}$ , find a vector of magnitude  $5\sqrt{3}$  units perpendicular to the vector  $\vec{q}$  and coplanar with vectors  $\vec{p}$  and  $\vec{q}$ .

23. Find the vector equation of the line joining  $(1, 2, 3)$  and  $(-3, 4, 3)$  and show that it is perpendicular to the z-axis.

### Section D

24. If  $A = \begin{bmatrix} 3 & 1 & 2 \\ 3 & 2 & -3 \\ 2 & 0 & -1 \end{bmatrix}$ , find  $A^{-1}$ .

Hence, solve the system of equations:

$$3x + 3y + 2z = 1$$

$$x + 2y = 4$$

$$2x - 3y - z = 5$$

OR

Find the inverse of the following matrix using elementary transformations.

$$\begin{bmatrix} 2 & -1 & 3 \\ -5 & 3 & 1 \\ -3 & 2 & 3 \end{bmatrix}$$

25. A cuboidal shaped godown with square base is to be constructed. Three times as much cost per square meter is incurred for constructing the roof as compared to the walls. Find the dimensions of the godown if it is to enclose a given volume and minimize the cost of constructing the roof and the walls.

26. Find the area bounded by the curves  $y = \sqrt{x}$ ,  $2y + 3 = x$  and  $x$ -axis.

OR

Find the area of the region.

$$\{(x, y) : x^2 + y^2 \leq 8, x^2 \leq 2y\}$$

27. Find the equation of the plane through the line  $\frac{x-1}{3} = \frac{y-4}{2} = \frac{z-4}{-2}$  and parallel to the

line  $\frac{x+1}{2} = \frac{1-y}{4} = \frac{z+2}{1}$ . Hence, find the shortest distance between the lines.

OR

Show that the line of intersection of the planes  $x + 2y + 3z = 8$  and  $2x + 3y + 4z = 11$  is coplanar with the line  $\frac{x+1}{1} = \frac{y+1}{2} = \frac{z+1}{3}$ . Also find the equation of the plane containing

them.

28. A manufacturer makes two types of toys A and B. Three machines are needed for this purpose and the time (in minutes) required for each toy on the machines is given below:

Types of Toys	Machines		
	I	II	III
A	20	10	10
B	10	20	30

The machines I, II and III are available for a maximum of 3 hours, 2 hours and 2 hours 30 minutes respectively. The profit on each toy of type A is ₹ 50 and that of type B is ₹ 60. Formulate the above problem as a L.P.P and solve it graphically to maximize profit.

29. The members of a consulting firm rent cars from three rental agencies: 50% from agency X, 30% from agency Y and 20% from agency Z. From past experience it is known that 9% of the cars from agency X need a service and tuning before renting, 12% of the cars from agency Y need a service and tuning before renting and 10% of the cars from agency Z need a service and tuning before renting. If the rental car delivered to the firm needs service and tuning, find the probability that agency Z is not to be blamed.

**SAMPLE QUESTION PAPER  
PHYSICAL EDUCATION (048)  
CLASS XII (2018-19)**

**TIME ALLOWED: 3 HRS**

**MAXIMUM MARKS: 70**

**GENERAL INSTRUCTIONS:**

- 1) The question paper consists of 26 questions.
- 2) All questions are compulsory.
- 3) Answer to question 1-11 carrying 1 mark should be in approximately 20- 30 words.
- 4) Answer to question 12-19 carrying 3 marks should be in approximately 80-100 words.
- 5) Answer to question 20-26 carrying 5 marks should be in approximately 150-200 words.

<b>SECTION – A</b>		
1	Define Endurance.	1
2	What is food intolerance?	1
3	Define Asana.	1
4	Mention any one cause of ODD.	1
	<b>Or</b>	
	What is seeding?	
5	Briefly mention two advantages of Weight Training.	1
6	What is menstrual dysfunction?	1
	<b>Or</b>	
	What do you understand by Diabetes?	
7	Mention the two advantages of Harvard step test.	1
8	What is sarcolemma?	1
	<b>Or</b>	
	Explain the benefits of Pavanmuktasana	
9	Enlist the classification of sports injuries.	1
10	Define Projectile.	1
	<b>Or</b>	
	Differentiate between gross and fine motor skills	
11	Explain the Jung's classification of personality.	1
<b>SECTION – B</b>		
12	Describe the advantages of league tournaments.	3
	<b>Or</b>	
	How composition of muscle fibers effect speed ?	

13	<p>Olympic Games draw attention of the world towards the importance of physical education. It develops health and better citizens. The development of loyalty, brotherhood and team spirit takes place through participation in games. The various diversities due to different castes, racial differences, languages, cultures, the difference between countries widens the outlook of sports person.</p> <p>(a) What values do the Olympic Games teaches the sports persons?  (b) According to you how Olympics is helping to create global unity?  (c) What Olympic games develops?</p>	3
14	Mention the sources of carbohydrates.	3
	<b>Or</b>	
	Elaborate the effects of exercise on size of the heart.	
15	Explain cognitive disability.	3
16	How dislocation can be managed?	3
17	Define Trajectory.	3
18	Explain the meaning of external motivation.	3
	<b>Or</b>	
	Explain any six changes due to ageing.	
19	Describe Fartlek training method.	3
	<b>SECTION – C</b>	
20	Draw a fixture of twenty six teams participating in the knockout tournament.	5
21	Explain the methods to prevent asthma.	5
22	Explain the factors affecting motor development.	5
	<b>Or</b>	
	Define friction in sports.	
23	Explain in detail on female athletes 'triad.	5
24	Explain the Barrow motor ability test.	5
25	Explain the physiological factors determining Strength and Speed.	5
26	Explain the types of coordinative abilities.	5
	<b>Or</b>	
	Explain the coping strategies.	

**Class XII**  
**Physics (042)**  
**Sample Question Paper 2018-19**

**Time allowed: 3 hours.**

**Max. Marks: 70**

**General Instructions:**

1. All questions are compulsory. There are 27 questions in all.
2. This question paper has four sections: Section A, Section B, Section C and Section D.
3. Section A contains five questions of one mark each, Section B contains seven questions of two marks each, Section C contains twelve questions of three marks each, and Section D contains three questions of five marks each.
4. There is no overall choice. However, internal choices have been provided in two questions of one mark, two questions of two marks, four questions of three marks and three questions of five marks weightage. You have to attempt only one of the choices in such questions.
5. You may use the following values of physical constants wherever necessary.

$$c = 3 \times 10^8 \text{ m/s}$$

$$h = 6.63 \times 10^{-34} \text{ Js}$$

$$e = 1.6 \times 10^{-19} \text{ C}$$

$$\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1}$$

$$\epsilon_0 = 8.854 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$$

$$\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2 \text{ C}^{-2}$$

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

$$\text{mass of neutron} = 1.675 \times 10^{-27} \text{ kg}$$

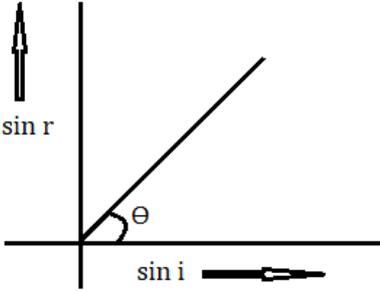
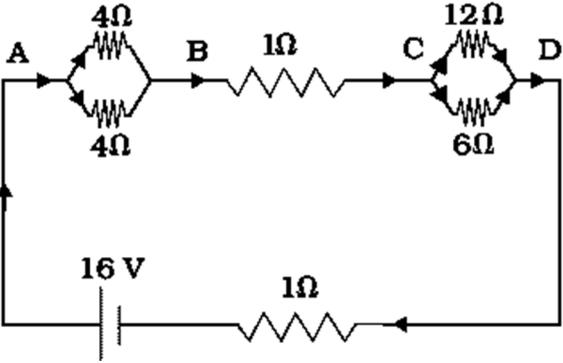
$$\text{mass of proton} = 1.673 \times 10^{-27} \text{ kg}$$

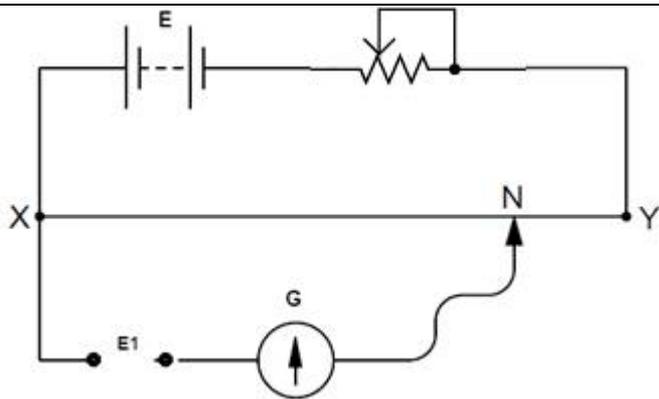
$$\text{Avogadro's number} = 6.023 \times 10^{23} \text{ per gram mole}$$

$$\text{Boltzmann constant} = 1.38 \times 10^{-23} \text{ JK}^{-1}$$

**Section-A**

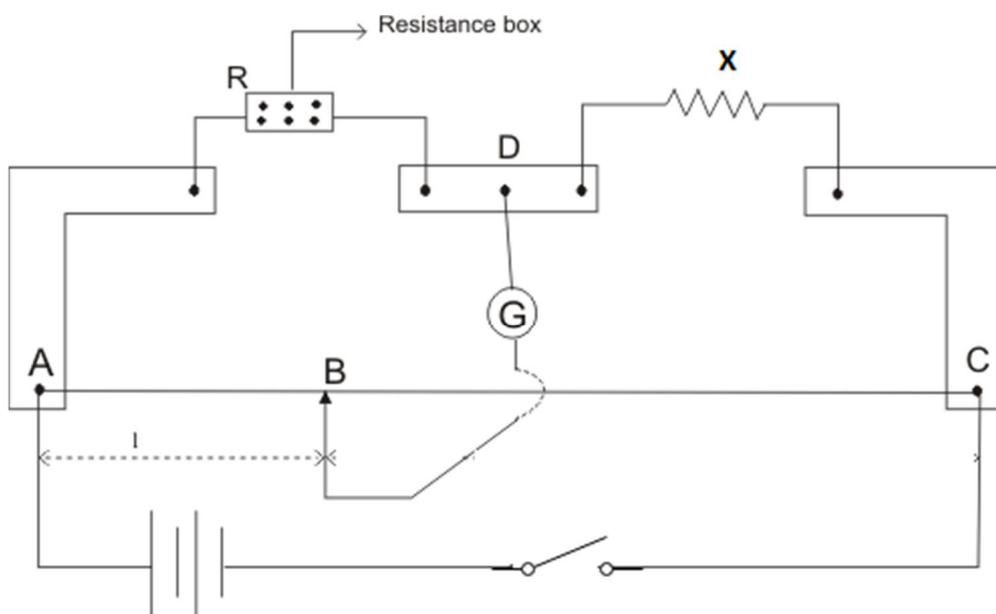
<b>1.</b>	State the SI unit of the electric polarization vector <b>P</b>	<b>1</b>
<b>2.</b>	Define temperature coefficient of resistivity	<b>1</b>

3.	Name the electromagnetic waves that are widely used as a diagnostic tool in medicine. <b>OR</b> Name the current which can flow even in the absence of electric charge.	1
4.	A ray of light is incident on a medium with angle of incidence 'i' and is refracted into a second medium with angle of refraction 'r'. The graph of sin i versus sin r is as shown. Find the ratio of the velocity of light in the first medium to the velocity of light in the second medium.  	1
5.	Two particles have equal momenta. What is the ratio of their de-Broglie wavelengths? <b>OR</b> Monochromatic light of frequency $6.0 \times 10^{14}$ Hz is produced by a laser. What is the energy of a photon in the light beam?	1
<b>Section-B</b>		
6.	A network of resistors is connected to a 16 V battery with internal resistance of $1 \Omega$ , as shown in the following figure. Compute the equivalent resistance of the network.  	2
<b>OR</b>		
A 9 V battery is connected in series with a resistor. The terminal voltage is found to be 8 V. Current through the circuit is measured as 5 A. What is the internal resistance of the battery?		
7.	The diagram below shows a potentiometer set up. On touching the jockey near to the end X of the potentiometer wire, the galvanometer pointer deflects to left. On touching the jockey near to end Y of the potentiometer, the galvanometer pointer again deflects to left but now by a larger amount. Identify the fault in the circuit and explain, using appropriate equations or otherwise, how it leads to such a one-sided deflection.	2



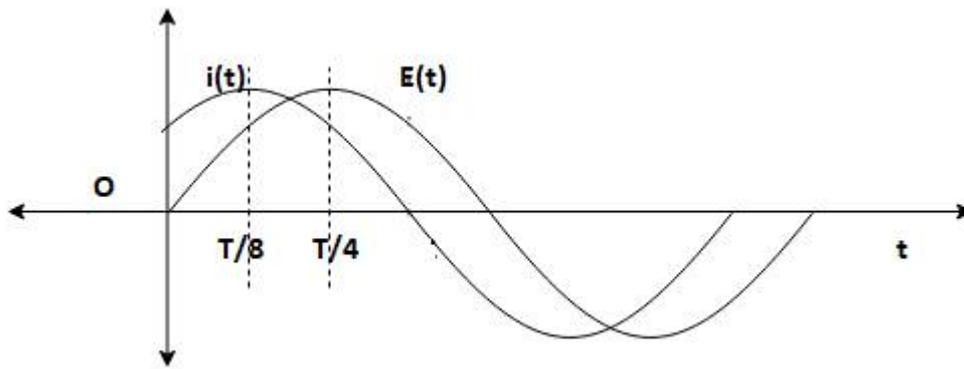
OR

7 Following circuit was set up in a meter bridge experiment to determine the value X of an unknown resistance. 2



- (a) Write the formula to be used for finding X from the observations.
- (b) If the resistance R is increased, what will happen to balancing length?

8. The figure shows two sinusoidal curves representing oscillating supply voltage and current in an ac circuit. 2

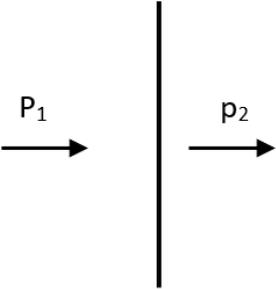
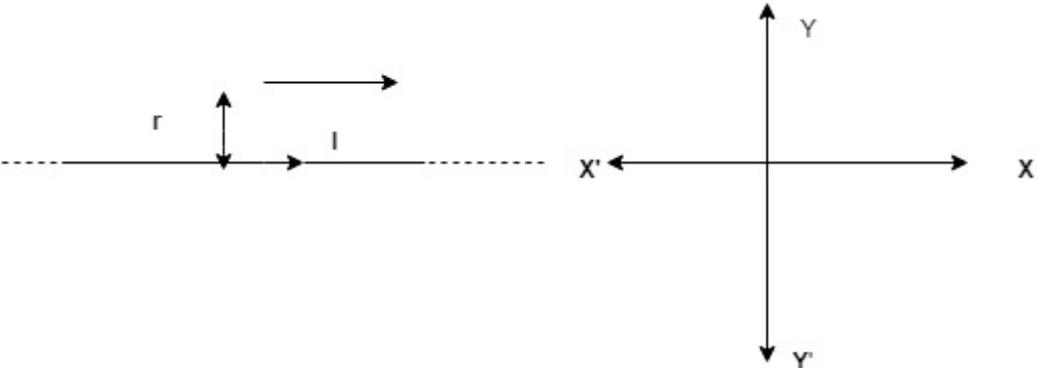


Draw a phasor diagram to represent the current and supply voltage appropriately as phasors. State the phase difference between the two quantities.

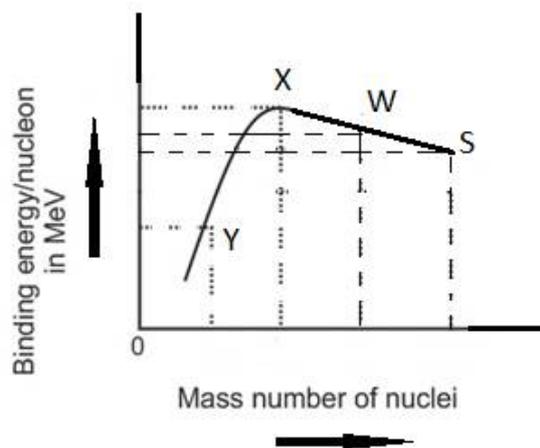
9.	Compare the following (i) Wavelengths of the incident solar radiation absorbed by the earth's surface and the radiation re-radiated by the earth. (ii) Tanning effect produced on the skin by UV radiation incident directly on the skin and that coming through glass window.	2
10.	A narrow slit is illuminated by a parallel beam of monochromatic light of wavelength $\lambda$ equals to $6000 \text{ \AA}$ and the angular width of the central maxima in the resulting diffraction pattern is measured. When the slit is next illuminated by light of wavelength $\lambda'$ , the angular width decreases by 30%. Calculate the value of the wavelength $\lambda'$ .	2
11.	What are universal gates? How can AND gate be realized using an appropriate combination of NOR gates?	2
12.	A TV transmission tower antenna is at a height of 20 m. How much range can it cover if the receiving antenna is at a height of 25 m?	2

### Section-C

13.	A particle, having a charge $+5 \mu\text{C}$ , is initially at rest at the point $x = 30 \text{ cm}$ on the x axis. The particle begins to move due to the presence of a charge $Q$ that is kept fixed at the origin. Find the kinetic energy of the particle at the instant it has moved 15 cm from its initial position if (a) $Q = +15 \mu\text{C}$ and (b) $Q = -15 \mu\text{C}$	3
14.	<p>(a) An electric dipole is kept first to the left and then to the right of a negatively charged infinite plane sheet having a uniform surface charge density. The arrows <math>p_1</math> and <math>p_2</math> show the directions of its electric dipole moment in the two cases.</p> <div style="text-align: center;"> </div> <p>Identify for each case, whether the dipole is in stable or unstable equilibrium. Justify each answer.</p>	3

	<p>(b) Next, the dipole is kept in a similar way (as shown), near an infinitely long straight wire having uniform negative linear charge density.</p> <div style="text-align: center;">  </div> <p>Will the dipole be in equilibrium at these two positions? Justify your answer.</p>	
15.	<p>Two material bars A and B of equal area of cross-section, are connected in series to a DC supply. A is made of usual resistance wire and B of an n-type semiconductor.</p> <p>(a) In which bar is drift speed of free electrons greater?  (b) If the same constant current continues to flow for a long time, how will the voltage drop across A and B be affected?</p> <p>Justify each answer.</p>	3
16.	<p>Derive an expression for the velocity <math>v_c</math> of a positive ions passing undeflected through a region where crossed and uniform electric field <math>E</math> and magnetic field <math>B</math> are simultaneously present.</p> <p>Draw and justify the trajectory of identical positive ions whose velocity has a magnitude less than <math>Iv_c l</math>.</p>	3
<b>OR</b>		
<p>A particle of mass <math>m</math> and charge <math>q</math> is in motion at speed <math>v</math> parallel to a long straight conductor carrying current <math>I</math> as shown below.</p>		
<div style="text-align: center;">  </div>		
<p>Find magnitude and direction of electric field required so that the particle goes undeflected.</p>		
17.	<p>A sinusoidal voltage of peak value 10 V is applied to a series LCR circuit in which resistance, capacitance and inductance have values of 10 <math>\Omega</math>, 1 <math>\mu\text{F}</math> and 1H respectively. Find (i) the peak voltage across the inductor at resonance (ii) quality factor of the circuit.</p>	3
18.	<p>a) What is the principle of transformer?</p>	3

	<p>b) Explain how laminating the core of a transformer helps to reduce eddy current losses in it</p> <p>c) Why the primary and secondary coils of a transformer are preferably wound on the same core</p>	
	<b>OR</b>	
	Show that in the free oscillations of an LC circuit, the sum of energies stored in the capacitor and the inductor is constant in time.	
<b>19.</b>	<p>Draw a labelled ray diagram to show the image formation in a refracting type astronomical telescope in the normal adjustment position. Write two drawbacks of refracting type telescopes.</p>	<b>3</b>
	<b>OR</b>	
	<p>(a) Define resolving power of a telescope. Write the factors on which it depends.</p> <p>(b) A telescope resolves whereas a microscope magnifies. Justify the statement.</p>	
<b>20.</b>	<p>A jar of height <math>h</math> is filled with a transparent liquid of refractive index <math>\mu</math>. At the centre of the jar on the bottom surface is a dot. Find the minimum diameter of a disc, such that when it is placed on the top surface symmetrically about the centre, the dot is invisible</p> <div style="text-align: center;"> </div>	<b>3</b>
<b>21.</b>	<p>(a) In photoelectric effect, do all the electrons that absorb a photon come out as photoelectrons irrespective of their location? Explain.</p> <p>(b) A source of light, of frequency greater than the threshold frequency, is placed at a distance 'd' from the cathode of a photocell. The stopping potential is found to be <math>V</math>. If the distance of the light source is reduced to <math>d/n</math> (where <math>n &gt; 1</math>), explain the changes that are likely to be observed in the (i) photoelectric current and (ii) stopping potential.</p>	<b>3</b>
<b>22.</b>	A monochromatic radiation of wavelength $975 \text{ \AA}$ excites the hydrogen atom from its ground state to a higher state. How many different spectral lines are possible in the resulting spectrum? Which transition corresponds to the longest wavelength amongst them?	<b>3</b>
<b>23.</b>	<p>Binding energy per nucleon versus mass number curve is as shown.</p> <p><math>{}^A_ZS</math>, <math>{}^{A_1}_{Z_1}W</math>, <math>{}^{A_2}_{Z_2}X</math> and <math>{}^{A_3}_{Z_3}Y</math> are four nuclei indicated on the curve.</p>	<b>3</b>



Based on the graph:

- (a) Arrange X, W and S in the increasing order of stability.  
 (b) Write the relation between the relevant A and Z values for the following nuclear reaction.



- (c) Explain why binding energy for heavy nuclei is low.

**OR**

How are protons, which are positively charged, held together inside a nucleus? Explain the variation of potential energy of a pair of nucleons as a function of their separation. State the significance of negative potential energy in this region?

24. A sinusoidal carrier wave of amplitude  $A_c$  and angular frequency  $\omega_c$  is modulated in accordance with a sinusoidal information signal of amplitude  $A_m$  and angular frequency  $\omega_m$ . Show that the amplitude modulated signal contains three frequencies centered around  $\omega_c$ . Draw the frequency spectrum of the resulting modulated signal. 3

**Section-D**

25. (a) Write the expression for the equivalent magnetic moment of a planer current loop of area A, having N turns and carrying a current i. Use the expression to find the magnetic dipole moment of a revolving electron. 5  
 (b) A circular loop of radius r, having N turns and carrying current I, is kept in the XY plane. It is then subjected to a uniform magnetic field  $\mathbf{B} = B_x \mathbf{i} + B_y \mathbf{j} + B_z \mathbf{k}$ . Obtain expression for the magnetic potential energy of the coil-magnetic field system.

**OR**

(a) A long solenoid with air core has n turns per unit length and carries a current I. Using Ampere's circuital law, derive an expression for the magnetic field B at an interior point on its axis. Write an expression for magnetic intensity  $\mathbf{H}$  in the interior of the solenoid.

(b) A (small) bar of material, having magnetic susceptibility  $\chi$ , is now put along the axis and near the centre, of the solenoid which is carrying a d.c. current through its coils. After some time, the bar is taken out and suspended freely with an unspun thread. Will the bar orient itself in magnetic meridian if (i)  $\chi < 0$  (ii)  $\chi > 1000$ ?

Justify your answer in each case.

26. (a) There are two sets of apparatus of Young's double slit experiment. In set A, the phase difference between the two waves emanating from the slits does not change with time, 5

	<p>whereas in set B, the phase difference between the two waves from the slits changes rapidly with time. What difference will be observed in the pattern obtained on the screen in the two set ups?</p> <p>(b) Deduce the expression for the resultant intensity in both the above mentioned set ups (A and B), assuming that the waves emanating from the two slits have the same amplitude A and same wavelength <math>\lambda</math>.</p>	
	<b>OR</b>	
	<p>(a) The two polaroids, in a given set up, are kept 'crossed' with respect to each other. A third polaroid, now put in between these two polaroids, can be rotated. Find an expression for the dependence of the intensity of light I, transmitted by the system, on the angle between the pass axis of first and the third polaroid. Draw a graph showing the dependence of I on <math>\Theta</math>.</p> <p>(b) When an unpolarized light is incident on a plane glass surface, find the expression for the angle of incidence so that the reflected and refracted light rays are perpendicular to each other. What is the state of polarisation, of reflected and refracted light, under this condition?</p>	
27.	<p>(a) Draw the circuit diagram to determine the characteristics of a pnp transistor in common emitter configuration.</p> <p>Explain, using I-V characteristics, how the collector current changes with the base current. How can (i) output resistance and (ii) current amplification factor be determined from the I-V characteristics?</p> <p style="text-align: center;"><b>OR</b></p> <p>(a) Why are photodiodes preferably operated under reverse bias when the current in the forward bias is known to be more than that in reverse bias?</p> <p>The two optoelectronic devices: - Photodiode and solar cell, have the same working principle but differ in terms of their process of operation. Explain the difference between the two devices in terms of (i) biasing, (ii) junction area and (iii) I-V characteristics.</p>	<b>5</b>