SECTION-A (READING)

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

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 pacifisms 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 pacifisms 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 Mohan-jo-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 dissent.” 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.

(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
   a) non-violence
   b) freedom of speech and action
   c) philosophical pacifisms
   d) practice of military organization

(iv) Mahabharata compares the warring world with
   a) wise men
   b) dog kennel
   c) song of the battle
   d) militarist

(v) Unearthing Mohan-jo–Daro reinforced the following of Pacifism
   a) there was no fortification and very few weapons
   b) they delivered the message of love
   c) they were apostles of peace
   d) thinks that the object of diplomacy is to avoid war

1.2 Answer the following questions briefly: (1X6=6)

   (i) How was war treated in India?
   (ii) Describe India’s preparedness for war in spite of their belief in Pacifism.
   (iii) How did the Aryans practice the Doctrine of Pacifism?
   (iv) What is Ahimsa?
   (v) What is the meaning of co-existence with rivals?
   (vi) 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)

   (i) What kind of unity did all the seers visualize?
   (ii) By some, Ashoka was considered as the cause of the downfall of the Mauryas. Do you agree? Give reasons for your answer.
   (iii) Which options were explored by Sri Krishna before resorting to war?
   (iv) 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)

   (i) express in definite and clear terms (para 3 )
   (ii) defensive wall (para 3)
   (iii) 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 RatanSahu, 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.

(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 subheadings. 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: \( \int \frac{1}{x^4} \, dx \)

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

OR

Find the angle between the vectors \( \vec{a} = \hat{i} + \hat{j} - \hat{k} \) 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 \( f: (0, \infty) \rightarrow R \) 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 \( R \) 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: \( (1-x^2) \frac{d^2y}{dx^2} = x \frac{dy}{dx} + m^2 y = 0 \)

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:

\[
\begin{align*}
3x + 3y + 2z &= 1 \\
x + 2y &= 4 \\
2x - 3y - z &= 5
\end{align*}
\]

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 \( x - \text{axis} \).

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 machine are needed for this purpose and the time (in minutes) required for each toy on the machines is given below:

<table>
<thead>
<tr>
<th>Types of Toys</th>
<th>Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>A</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>10</td>
</tr>
</tbody>
</table>

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.
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.

\[
\begin{align*}
c &= 3 \times 10^8 \text{ m/s} \\
h &= 6.63 \times 10^{-34} \text{ Js} \\
e &= 1.6 \times 10^{-19} \text{ C} \\
\mu_0 &= 4\pi \times 10^{-7} \text{ T m A}^{-1} \\
\varepsilon_0 &= 8.854 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^2 \\
\frac{1}{4\pi\varepsilon_0} &= 9 \times 10^9 \text{ N m}^2 \text{ C}^{-2} \\
m_e &= 9.1 \times 10^{-31} \text{ kg} \\
\text{mass of neutron} &= 1.675 \times 10^{-27} \text{ kg} \\
\text{mass of proton} &= 1.673 \times 10^{-27} \text{ kg} \\
\text{Avogadro’s number} &= 6.023 \times 10^{23} \text{ per gram mole} \\
\text{Boltzmann constant} &= 1.38 \times 10^{-23} \text{ JK}^{-1}
\end{align*}
\]

<table>
<thead>
<tr>
<th>Section-A</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>State the SI unit of the electric polarization vector ( \mathbf{P} )</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Define temperature coefficient of resistivity</td>
<td>1</td>
</tr>
</tbody>
</table>
3. Name the electromagnetic waves that are widely used as a diagnostic tool in medicine.  
   OR 
   Name the current which can flow even in the absence of electric charge.

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.

   ![Diagram](image)

5. Two particles have equal momenta. What is the ratio of their de-Broglie wavelengths?  
   OR 
   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?

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### Section B

6. A network of resistors is connected to a 16 V battery with internal resistance of 1 Ω, as shown in the following figure. Compute the equivalent resistance of the network.  
   OR 
   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.
7. Following circuit was set up in a meter bridge experiment to determine the value X of an unknown resistance.

| (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.
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.

10. A narrow slit is illuminated by a parallel beam of monochromatic light of wavelength $\lambda$ equals to 6000 Å 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 $\lambda'$.

11. What are universal gates? How can AND gate be realized using an appropriate combination of NOR gates?

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?

**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) $Q = -15 \, \mu\text{C}$

14. (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 $p_1$ and $p_2$ show the directions of its electric dipole moment in the two cases.

Identify for each case, whether the dipole is in stable or unstable equilibrium. Justify each answer.
(b) Next, the dipole is kept in a similar way (as shown), near an infinitely long straight wire having uniform negative linear charge density.

![Diagram of dipole and wire](image)

Will the dipole be in equilibrium at these two positions? Justify your answer.

<table>
<thead>
<tr>
<th>15. 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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) In which bar is drift speed of free electrons greater?</td>
</tr>
<tr>
<td>(b) If the same constant current continues to flow for a long time, how will the voltage drop across A and B be affected?</td>
</tr>
</tbody>
</table>

Justify each answer.

<table>
<thead>
<tr>
<th>16. Derive an expression for the velocity $v_C$ of a positive ions passing undeflected through a region where crossed and uniform electric field $E$ and magnetic field $B$ are simultaneously present.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draw and justify the trajectory of identical positive ions whose velocity has a magnitude less than $</td>
</tr>
</tbody>
</table>

**OR**

A particle of mass $m$ and charge $q$ is in motion at speed $v$ parallel to a long straight conductor carrying current $I$ as shown below.

![Diagram of particle and conductor](image)

Find magnitude and direction of electric field required so that the particle goes undeflected.

<table>
<thead>
<tr>
<th>17. 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 Ω, 1μF and 1H respectively. Find (i) the peak voltage across the inductor at resonance (ii) quality factor of the circuit.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>18. a) What is the principle of transformer?</th>
</tr>
</thead>
</table>
b) Explain how laminating the core of a transformer helps to reduce eddy current losses in it.

c) Why the primary and secondary coils of a transformer are preferably wound on the same core.

OR

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.

19. 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.

OR

(a) Define resolving power of a telescope. Write the factors on which it depends.

(b) A telescope resolves whereas a microscope magnifies. Justify the statement.

20. A jar of height h is filled with a transparent liquid of refractive index μ. 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.

21. (a) In photoelectric effect, do all the electrons that absorb a photon come out as photoelectrons irrespective of their location? Explain.

(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 V. If the distance of the light source is reduced to d/n (where n > 1), explain the changes that are likely to be observed in the (i) photoelectric current and (ii) stopping potential.

22. A monochromatic radiation of wavelength 975 Å 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?

23. Binding energy per nucleon versus mass number curve is as shown. The nuclei {\( ^2_4S, ^{21}_{41}W, ^{22}_{42}X \) and} \( ^{23}_{42}Y \) are four nuclei indicated on the curve.
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.

\[ S \rightarrow X + W \]

(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.

Section-D

25. (a) Write the expression for the equivalent magnetic moment of a planar 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.

(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 circuit law, derive an expression for the magnetic field \( \mathbf{B} \) 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,
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?

(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 λ.

**OR**

(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 θ.

(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?

27. (a) Draw the circuit diagram to determine the characteristics of a pnp transistor in common emitter configuration.

   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?

   **OR**

   (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?

   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.
**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.

**Section-A**

<table>
<thead>
<tr>
<th>Q.no.</th>
<th>Question</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ZnO crystal on heating acquires the formula Zn(_{1+x})O. Give reason.</td>
<td>1</td>
</tr>
<tr>
<td>OR</td>
<td>There is an increase in conductivity when Silicon is doped with Phosphorous. Give reason</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Based on the type of dispersed phase, what type of colloids are micelles?</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>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 &lt; P).</td>
<td>1</td>
</tr>
<tr>
<td>OR</td>
<td>Low spin configuration are rarely observed in tetrahedral coordination entity formation. Explain</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Identify the compound that on hydrogenation produces an optically active compound from the following compounds:</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><img src="A" alt="Chemical Structure" /></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="B" alt="Chemical Structure" /></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Write the name of the biodegradable polymer used in orthopaedic devices.</td>
<td>1</td>
</tr>
</tbody>
</table>
Section-B

6. 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, K_f water = 1.86 K kg / mol]

OR

Calculate the molality of ethanol solution in which the mole fraction of water is 0.88.

7. Identify the reaction and write the IUPAC name of the product formed:
   (a) CH_3-CH_2-COOH
   (i) Br_2 / Red phosphorous
   (b) O
   H_2
   Pd BaSO_4

OR

Write the structures and IUPAC names of the cross aldol condensation products only of ethanal and propanal.

8. (a) Justify the role of tert-butyl peroxide in the polymerization of ethene.
(b) Write the structures of the monomers of the following polymer:

9. Write the mechanism of acid dehydration of ethanol to yield ethane

10. For a certain chemical reaction variation in concentration [A] vs. time (s) plot is given below:

   (i) Predict the order of the given reaction?
   (ii) What does the slope of the line and intercept indicate?
   (iii) What is the unit of rate constant k?
11. Draw the molecular structures of the following:
   (a) Noble gas species which is isostructural with \( BrO_3^- \)
   (b) Dibasic oxoacid of phosphorus

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.

\[
E^o_{Cr^{3+}/Cr^{2+}} = -0.4V \\
E^o_{Mn^{3+}/Mn^{2+}} = +1.5V \\
E^o_{Fe^{3+}/Fe^{2+}} = +0.8V
\]

**Section-C**

13. Niobium crystallises in body-centred cubic structure. If the atomic radius is 143.1 pm, calculate the density of Niobium. (Atomic mass = 93u).

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.

15. An alcohol A (C\(_4\)H\(_{10}\)O) on oxidation with acidified potassium dichromate gives acid B (C\(_4\)H\(_8\)O\(_2\)). Compound A when dehydrated with conc. H\(_2\)SO\(_4\) at 443 K gives compound C. Treatment of C with aqueous H\(_2\)SO\(_4\) gives compound D (C\(_4\)H\(_{10}\)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.

16. Which one of the following compounds will undergo faster hydrolysis reaction by S\(_N\)1 mechanism? Justify your answer.

\[
\begin{align*}
&\text{CH}_2\text{Cl} \\
&\text{or} \quad \text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}
\end{align*}
\]

OR

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. Complete the following reactions:

(a) \[
\begin{array}{c}
\text{H}_2\text{N-OH} \\
\text{H}_2\text{N-OH} \\
\end{array}
\]

(b) \[
\begin{array}{c}
\text{H}_2\text{N-OH} \\
\text{H}_2\text{N-OH} \\
\end{array}
\]

(c) \[
\begin{array}{c}
\text{H}_2\text{N-OH} \\
\text{H}_2\text{N-OH} \\
\end{array}
\]

18. Give reasons for the following:

(i) Use of aspartame as an artificial sweetener is limited to cold foods.
(ii) Metal hydroxides are better alternatives than sodium hydrogen carbonate for treatment of acidity.
(iii) Aspirin is used in prevention of heart attacks.

19. (a) Name the branched chain component of starch.
(b) Ribose in RNA and deoxyribose in DNA differ in the structure around which carbon atom?
(c) How many peptide linkages are present in a tripeptide?

OR

Give three reactions of glucose which cannot be explained by its chain structure

20. The following data were obtained during the first order thermal decomposition of \( \text{N}_2\text{O}_5(g) \) at a constant volume:

\[
2\text{N}_2\text{O}_5(g) \rightarrow 2\text{N}_2\text{O}_4(g) + \text{O}_2(g)
\]

<table>
<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>

Calculate the rate constant

OR

Two reactions of the same order have equal pre exponential factors but their activation energies differ by 24.9 kJ mol\(^{-1}\). Calculate the ratio between the rate constants of these reactions at 27°C. (Gas constant \( R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1} \))
21. (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?

(b) Explain how the phenomenon of adsorption finds application in Heterogeneous catalysis.

(c) Which of the following electrolytes is the most effective for the coagulation of Fe(OH)_3 sol which is a positively charged sol?
NaCl, Na_2SO_4, Na_3PO_4

22. Describe how the following steps can be carried out?
(a) Recovery of Gold from leached gold metal complex.
(b) Conversion of Zirconium iodide to pure Zirconium.
(c) Formation of slag in the extraction of copper.
(Write the chemical equations also for the reactions involved)

OR

Explain the use of the following:

a) NaCN in Froth Floatation Method.
b) Carbon monoxide in Mond process.
c) Coke in the extraction of Zinc from Zinc Oxide

23. Explain the following:
(a) Out of Sc^{3+}, Co^{2+} and Cr^{3+} ions, only Sc^{3+} is colourless in aqueous solutions.
   (Atomic no.: Co = 27; Sc = 21 and Cr = 24)
(b) The $E'_{Cu^{2+}/Cu}$ for copper metal is positive (+0.34), unlike the remaining members of the first transition series
(c) La(OH)_3 is more basic than Lu(OH)_3.

24. A metal complex having composition Cr(NH_3)_4Cl_2Br has been isolated in two forms A and B. The form A reacts with AgNO_3 to give a white precipitate readily soluble in dilute aqueous ammonia whereas B gives a pale yellow precipitate soluble in concentrated ammonia.

(i) Write the formulae of isomers A and B.
(ii) State the hybridisation of chromium in each of them.
(iii) Calculate the magnetic moment (spin only value) of the isomer A
Section-D

25. (a) Identify A-D

(b) Distinguish between the following pair of compounds:
   (i) Aniline and Benzylamine.
   (ii) Methylamine and Dimethylamine.

(c) Complete the following:

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:

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

(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:

Write the overall cell reaction.
(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:

<table>
<thead>
<tr>
<th>Concentration (M)</th>
<th>Conductivity (Scm⁻¹)</th>
<th>Molar conductivity (S cm² mol⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.100</td>
<td>106.74 x 10⁻⁴</td>
<td>106.7</td>
</tr>
<tr>
<td>0.05</td>
<td>55.53 x 10⁻⁴</td>
<td>111.1</td>
</tr>
<tr>
<td>0.02</td>
<td>23.15 x 10⁻⁴</td>
<td>115.8</td>
</tr>
</tbody>
</table>

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⁻¹, calculate the molar conductivity of KCl solution.

27. (a) Account for the following observations:

(i) SF₄ is easily hydrolysed whereas SF₆ 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 CO₂.
(ii) XeF₆ undergoes partial hydrolysis.
(Give the chemical equations involved).

OR

(a) What inspired N.Bartlett for carrying out reaction between Xe and PtF₆?
(b) Arrange the following in the order of property indicated against each set:

(i) F₂, I₂, Br₂, Cl₂ (increasing bond dissociation enthalpy)
(ii) NH₃, AsH₃, SbH₃, BiH₃, PH₃ (decreasing base strength)

(c) Complete the following equations:

(i) \( Cl₂ + NaOH(cold and dilute) \rightarrow \)
(ii) \( Fe^{3+} + SO₃ + H₂O \rightarrow \)
# 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?

   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.

3. The prophase I stage of meiosis plays a vital role in r-DNA formation. Justify with reason.

4. Name the technique by which Gene expression can be controlled with the help of RNA molecule.

5. Define Diapause

   OR

   Define Standing Crop
SECTION- B

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

![Molecule Image]

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

OR

7. 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.

8. Why does the lac operon shut down some time after the addition of lactose in the medium where \textit{E.coli} was growing? Why low level expression of lac operon is always required?

9. a) While cloning vectors, which of the two will be preferred by biotechnologists - bacteriophages or plasmids. Justify with reason.
b) Name the first transgenic cow developed and state the improvement in the quality of the product produced by it.

OR

9. Explain the impact of removal of thymus gland on the immune system of a human body.

10. A farmer maintained beehives in his \textit{Brassica} field during its flowering season. How will he be benefitted?

11. How do automobiles fitted with catalytic converters reduce air pollution? Suggest the best fuel for such vehicles.

12. State the Mendelian principle which can be derived from a dihybrid cross and not from monohybrid cross.

13. Comment upon the mode of pollination in \textit{Vallisneria} and \textit{Eichhornia} which have emergent flowers.
SECTION- C

13. Alien species are highly invasive and are a threat to indigenous species. Substantiate this statement with any three examples.

14. The embryo sac in female gametophyte is seven celled and eight nucleated structure. Justify the statement with the help of a labelled diagram.

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.

16. Explain the different steps involved in the secondary treatment of sewage.

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?
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.

19. a) Construct a complete transcription unit with promoter and terminator on the basis of the hypothetical template strand given below:

| A | T | G | C | A | T | G | C | A | T | A | C |

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.

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.

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.
   (a) Typhoid    (b) Viral Fever (c) Malaria

23. Study the given pedigree chart and answer the questions that follow:

   (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.
   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.

   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.

   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.

   OR

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

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Part</th>
<th>Question Description</th>
<th>Marks</th>
</tr>
</thead>
</table>
| 1      | (a)  | Write the type of C++ Operators (Arithmetic, Logical, and Relational Operators) from the following:
|        |      | (i) ! (ii) != (iii) && (iv) % |
|        | (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: |
|        |      | void main()
|        |      | { char text[20], newText[20]; gets(text); strcpy(newText,text); for(int i=0;i<strlen(text);i++)
|        |      | if(text[i] = =’A’) text[i] = text[i]+2; puts(text); }
|        | (c)  | Rewrite the following C++ code after removing any/all Syntactical Error(s) with each correction underlined.
|        |      | #define float PI 3.14
|        |      | void main( )
|        |      | { float R=4.5,H=1.5;
|        |      | A=2*PI*R*H + 2*PIpow(R,2);
|        |      | cout<<'Area='<<A<<endl; }

Note: Assume all required header files are already being included in the program.
### (d) Find and write the output of the following C++ program code:

**Note:** Assume all required header files are already being included in the program.

```cpp
void main() {
    int Ar[] = { 6, 3, 8, 10, 4, 6, 7 };
    int *Ptr = Ar, I;
    cout << ++*Ptr++ << '@';
    I = Ar[3] - Ar[2];
    cout << ++*(Ptr+I) << '@' << 'n';
    cout << ++I + *Ptr++ << '@';
    cout << *Ptr++ << '@' << 'n';
    for( ; I >=0 ; I -= 2)
        cout << Ar[I] << '@';
}
```

### (e) Find and write the output of the following C++ program code:

```cpp
typedef char STRING[80];
void MIXNOW(STRING S)
{
    int Size=strlen(S);
    for(int I=0;I<Size;I+=2)
    {
        char WS=S[I];
        S[I]=S[I+1];
        S[I+1]=WS;
    }
    for (I=1;I<Size;I+=2)
        if (S[I]>'M' && S[I]<='U')
            S[I]='@';
}
void main()
{
    STRING Word="CBSEEXAM2019";
    MIXNOW(Word);
    cout<<Word<<endl;
}
```

### (f) 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?

**Note:** Assume all required header files are already being included in the program.

```cpp
void main( )
{
    randomize();
    int Ar[]={10,7}, N;
```
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>int Alter=random(2) + 10 ;  for (int C=0;C&lt;2;C++)  {   N=random(2) ;  cout&lt;&lt;Ar[N] +Alter&lt;&lt;&quot;#&quot;;  }</td>
<td></td>
</tr>
<tr>
<td>i) 21#20#</td>
<td>ii) 20#18#</td>
<td></td>
</tr>
<tr>
<td>(ii) 20#17#</td>
<td>(iv) 21#17#</td>
<td></td>
</tr>
</tbody>
</table>

2. (a) What is a copy constructor? Illustrate with a suitable C++ example.

(b) 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.

```cpp
void My_fun ( ) // Function 1
{
    for (int I=1 ; I<=50 ; I++) cout<< "-" ;
    cout<<end1 ;
}
void My_fun (int N)    // Function 2
    for (int I=1 ; I<=N ; I++) cout<<"*" ;
    cout<<end1 ;
void My_fun (int A, int B) // Function 3
    for (int I=1 ; I<=B ;I++) cout <<A*I ;
    cout<<end1 ;
void My_fun (char T, int N) // Function 4
    for (int I=1 ; I<=N ; I++) cout<<T ;
    cout<<end1;
}
void main ( )
{
    int X=7, Y=4, Z=3;
    char C="#" ;
    My_fun (C,Y) ;    
    My_fun (X,Z) ;
}
```

**OR**

(b) Write any four differences between Constructor and Destructor function with respect to object oriented programming.
Define a class Ele_Bill in C++ with the following descriptions:

**Private members:**
- 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.

Amount can be calculated according to the following conditions:

<table>
<thead>
<tr>
<th>No_of_units</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

**Public members:**
- A function Accept( ) which allows user to enter Cname, Pnumber, No_of_units and invoke function Calc_Amount().
- A function Display( ) to display the values of all the data members on the screen.

---

Answer the questions (i) to (iv) based on the following:

```cpp
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:
```
### Schedule();
### void Start();
### void View();
};
### void main()
### {
###     Schedule S;       //Statement 1
###     ____________    //Statement 2
### }

(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()?

---

**OR**

(d) Consider the following class State :

```
class State  
{  
    protected : 
    int tp;  
    public : 
    State( ) { tp=0; }  
    State( ) { tp++; }  
    void inctp() { tp++; }  
    int gettp(); { return tp; }  
};
```

Write a code in C++ to publically derive another class ‘District’ with the following additional members derived in the public visibility mode.

**Data Members :**

- Dname string
- Distance float
- Population long int

**Member functions :**

- DINPUT( ) : To enter Dname, Distance and population
- DOUTPUT( ) : To display the data members on the screen.
|   |   | Write a user-defined function `AddEnd4(int A[][4], int R, int C)` 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:

\[
\begin{array}{cccc}
24 & 16 & 14 \\
19 & 5 & 4 \\
\end{array}
\]

The output should be 42 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td>Write a user defined function in C++ to find the sum of both left and right diagonal elements from a two dimensional array.</td>
</tr>
</tbody>
</table>
| (b) |   | Write a user-defined function `EXTRA_ELE(int A[], int B[], int N)` 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)
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 |
| (b) |   |   |
| (c) |   | An array `S[10][30]` is stored in the memory along the column with each of its element occupying 2 bytes. Find out the memory location of `S[5][10]`, if element `S[2][15]` is stored at the location 8200. |
| (c) |   | An array `A[30][10]` 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 `A[12][8]`, if the content is stored along the row. |
| (d) |   | Write the definition of a member function `Ins_Player()` for a class `CQUEUE` in C++, to add a Player in a statically allocated circular queue of `PLAYERs` considering the following code is already written as a part of the program:
struct Player
{
    long Pid;
    char Pname[20];
} |
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
};

OR

(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:
struct Book
{
    int BNo;
    char BName[20];
    Book *Next;
};

(e)
Convert the following Infix expression to its equivalent Postfix expression,
showing the stack contents for each step of conversion.
A/B+C*(D-E)

OR

Evaluate the following Postfix expression:
4,10,5,+,*,15,3,/-

4
(a) Write a function RevText() to read a text file “Input.txt“ and Print only
word starting with ‘I’ in reverse order.
Example: If value in text file is: INDIA IS MY COUNTRY
Output will be: AIDNI SI MY COUNTRY

OR

(a) Write a function in C++ to count the number of lowercase alphabets present
in a text file “BOOK..txt”.

1
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:

```cpp
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>>Bno; gets(From); get(To); }
        void show(); { cout<<Bno<<"":""<<From<<"":""<<To<<endl; }
};
```

OR

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:

```cpp
class STU {
    int Rno;
    char Sname[20];

    public: void Enter() {
        cin>>Rno; gets(Sname);
    }
    void show() {
        cout<<Rno<<Sname<<endl;
    }
};
```

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.

```cpp
class PRODUCT {
    int PCode; char PName[20];

    public:
        void Entry(); void Disp();
};

void main() {
    ifstream In;
    In.open("PRODUCT.DAT",ios::binary|ios::in); 
    PRODUCT P; 
    In.seekg(0,ios::end);
    cout<<"Total Count: "<<In.tellg()/sizeof(P)<<endl;
}
In.seekg(70*sizeof(P));
In.read((char*)&P, sizeof(P));
In.read((char*)&P, sizeof(P));
cout<<"At Product:"<<In.tellg()/sizeof(P) + 1;
In.close();

OR

(c) Which file stream is required for seekg()?

5 (a) Observe the following table and answer the parts(i) and(ii) accordingly

Table: Product

<table>
<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>

(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) Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables.

<table>
<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>MANIPRAHBA</td>
<td>CHENNAI</td>
<td>2001-12-12</td>
<td>69000</td>
</tr>
</tbody>
</table>

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

(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?

(c) Your friend wishes to install a wireless network in his office. Explain him the difference between guided and unguided media.

(d) Write the expanded names for the following abbreviated terms used in Networking and Communications:
   (i) CDMA
   (ii) HTTP
   (iii) XML
   (iv) URL

(e) 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).

Multipurpose Public School, Bangluru
Distance between various wings are given below:

<table>
<thead>
<tr>
<th>Wing</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>AtoS</td>
<td>100m</td>
</tr>
<tr>
<td>AtoJ</td>
<td>200m</td>
</tr>
<tr>
<td>AtoH</td>
<td>400m</td>
</tr>
<tr>
<td>StoJ</td>
<td>300m</td>
</tr>
<tr>
<td>StoH</td>
<td>100m</td>
</tr>
<tr>
<td>JtoH</td>
<td>450m</td>
</tr>
</tbody>
</table>

Number of Computers installed at various wings are as follows:

<table>
<thead>
<tr>
<th>Wings</th>
<th>Number of Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20</td>
</tr>
<tr>
<td>S</td>
<td>150</td>
</tr>
<tr>
<td>J</td>
<td>50</td>
</tr>
<tr>
<td>H</td>
<td>25</td>
</tr>
</tbody>
</table>

(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 Server 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
Engineering Graphics (046)
Sample Question Paper 2018-19

Time allowed: 3 Hours

Max. Marks: 70

General Instructions:
(i) Attempt all the questions.
(ii) Use both sides of the drawing sheet, if necessary.
(iii) All dimensions are in millimetres.
(iv) Missing and mismatching dimensions, if any, may be suitably assumed.
(v) Follow the SP:46-2003 revised codes(with first angle method of projection).
(vi) In no view of question2, are hidden edges or lines required.
(vii) In question 4, hidden edges or lines are to be shown in views without section.
(viii) Number your answers according to questions.

Section-A

1. Answer the following Multiple Choice questions. Print the correct choice on your drawing sheet.

   (i) An inclined edge in isometric projection is drawn by
       a) Using angle of inclination
       b) Drawing a line at 90° to the vertical
       c) Drawing a line at 30° to the horizontal
       d) Using the co-ordinates

   (ii) Which one of the following is used to join shaft and hub?
       a) Gib
       b) Key
       c) Cotter
       d) Rivet

   (iii) The angle between the flanks of a BSW thread profile is
       a) 55°
       b) 60°
       c) 30°
       d) 45°

   (iv) cut on the outer surface of a circular rod are called
       a) The threads Crest thread
       b) Root thread
       c) Internal thread
       d) External thread
(v) Which one of the following is represented by thin continuous lines?
   a) Centre lines
   b) Visible lines
   c) Extension lines
   d) Hidden lines

2. (i) Construct an isometric scale.
(ii) An inverted frustum of a square pyramid (base edges 40mm and 50mm, height 35mm) is resting on H.P with two of its base edges perpendicular to V.P. Draw its isometric projection. Show the axis and indicate the direction of viewing. Give all the dimensions.

(ii) A sphere (diameter 70mm) is placed centrally on the top hexagonal face of a hexagonal prism (base edge 25mm, height 50mm). Two of the base edges of the prism are parallel to V.P. The common axis is perpendicular to H.P. Draw the isometric projection of the combination of solids. Show the common axis and indicate the direction of viewing. Give all the dimensions.

3. (i) Draw to scale 1:1, the standard profile of a **Knuckle Thread**, taking enlarged pitch as 50mm. Give standard dimensions.

   OR

   (i) Draw to scale 1:1, the front view and top view of a **Square Headed Nut** of diameter 30mm, keeping the axis vertical. Give standard dimensions.

   (ii) Sketch freehand the front view and top view of a **Pan Head Rivet** of size M20, keeping the axis vertical. Give standard dimensions.

   OR

   (ii) Sketch freehand the front view and side view of a **Collar Stud** of size M20, keeping the horizontal. Give standard dimensions.

4. **Figure 1** shows the details of the parts of an **SOCKET AND SPIGOT COTTER JOINT**. Assemble these parts correctly, and then draw the following views using scale 1:1.
   (i) Front view, upper half in section.
   (ii) Left side view.
   Print the title and the scale used. Draw the projection symbol. Give 6 important dimensions.

   OR

   **Figure 2** shows the assembly of a **BUSHED BEARING**. Disassemble the parts and then draw the following views of the following components to scale 1:1, keeping their position same with respect to H.P. and V.P.
   (i) **BODY**
      a) Front view, left half in section.
      b) Side view.
   (ii) **BUSH**
      a) Front view.
      b) Side view in section
   Print the titles and the scale used. Draw the projection symbol. Give 6 important dimensions.
FIG I. SPIGOT AND SOCKET JOINT

NOTE: FIGURE NOT TO SCALE. USE THE GIVEN DIMENSIONS FOR SOLUTIONS.
FIG. 2 BUSHED BEARING

FILLETS & ROUNDS = 4 MM

NOTE: FIGURE NOT TO SCALE. USE THE GIVEN DIMENSIONS FOR SOLUTIONS
Class XII
Biotechnology (045)
Sample Question Paper 2018-19

Time allowed: 3 Hours
Max. Marks: 70

General Instructions:
(i) Question paper contains four sections-A, B, C and D.
(ii) All questions are compulsory.
(iii) There is internal choice in all sections. You have to attempt only one of the choices in such questions.
(iv) Question numbers 1 to 6 are very short answer questions, carrying 1 mark each.
(v) Question numbers 7 to 14 are short answer questions, carrying 2 marks each.
(vi) Question numbers 15 to 25 are also short answer questions, carrying 3 marks each.
(vii) Question numbers 26 to 28 are long answer questions, carrying 5 marks each.
(viii) Use of calculators is not permitted. However, you may use log tables, if necessary.

SECTION-A

1. 4 copies of ds DNA are subjected to polymerase chain reaction. How many copies would be obtained after 20 cycles?

OR

How can we use LEU 2 gene as a selectable marker?

2. Specify the role of alkaline phosphatase in cloning.

3. Specific activity increases during subsequent steps of a protein purification scheme. How can you relate it with the purity of protein?

4. Animal cells in a culture medium were placed in a regular incubator used for growing bacterial cells. Do you expect the animal cells to grow or not?

5. What is Gene Knock out?

6. What will be the consequence if a protein is having an altered structure?

OR

Expand and define PER?

SECTION-B

7. What are inverted microscopes and why are they useful in animal cell culture lab?

OR

Enlist the advantages and limitations of animal cell culture (two each).
8. Explain a visual method of screening the transformed host cells.

9. Interspecific cross leads to formation of sterile seeds. What could be the reasons for the same and how can normal development be achieved?

10. A protein from cell A and cell B is compared to find the whole protein pattern by a technique developed by O’Farrel. Name the technique. State its principle.

11. C.elegans is a eukaryotic organism with a genome of 97 Mb and about 20,000 genes. What organizational features of this genome are unusual when compared to the genomes of other eukaryotes, such as yeast and Drosophila?

OR

Annotation of human genome sequence reveals that our genome contains 30000- 33000 genes. Proteomic analysis indicates that human cells are capable of synthesizing more than 30,000 different proteins. How can this discrepancy be reconciled?

12. Foot and Mouth Disease Virus(FMDV) vaccine is made by growing the virus in animal cells, harvesting the virus and inactivating it for vaccine formulations. Given the following data, calculate the weight and volume of the harvested virus from a bioreactor-
(a) Total bioreactor capacity = 1000 l (atleast 20% space must be kept for oxygen and CO₂)
(b) Number of animal cells = 10⁵/ml
(c) Number of virus particles/animal cell = 50
Assume the virus to be a sphere with a gram molecular weight of 10⁶ Daltons (1 million) and radius = 1nm.

OR

Recombinant insulin is produced at 100 mg/L by E. coli at a cell concentration of 1 g/L. Calculate the volume of reactor (size of the fermentor) needed to produce 1 Kilogram of insulin in the following conditions:
(a) When the cell concentration is 1 g/L and insulin production is 100 mg /L.
(b) When the cell concentration is 50 g/L and insulin production is 100 mg /L.

13. Name the plant variations developed by long term callus and suspension culture in plants. How can such variations be used in crop improvement?

14. Foaming is a problem in most microbiological processes. Mention any two possible causes of this problem? How can it be controlled?

SECTION-C

15. What is Molecular Pharming? State its advantages (any 4)

16. Outline the process of creation of chimeric mouse by embryonic stem cell culture.
17. A specific DNA sequence is identified from a heterogeneous population of DNA molecules on the basis of DNA-DNA hybridization.
   a) Identify the technique.
   b) Schematically depict the steps of DNA separation technique.

18. Based on Genomic studies, why do people say that different species and organisms had a common ancestor 100 million years ago.

   OR

   The publication of ‘Atlas of Protein Sequences and Structure’ under the editorship of Margaret O’ Dayhoff was a pioneering effort. Why?

19. Describe the important parts of a mass spectrometer with diagram. Why has this technique become so important in studying proteins?

   OR

   Give reasons for the following:
   (i) Kappa casein is involved in micelle stabilization of milk proteins.
   (ii) Whey protein detoxifies xenobiotics.
   (iii) Curd is used as pro-biotic.

20. What is meant by tissue engineering? Explain any two important medical applications of tissue engineering.

   OR

   How do we analyse the growth characteristics of a particular cell line.

21. Enlist any six good laboratory practices, which need to be followed while working with microbes.

22. With an example illustrate-
   (a) a blunt end cutter restriction enzyme
   (b) a sticky end cutter restriction enzyme.
   Which types of ends are better and why?

23. There are several concerns being raised in accepting transgenic crops. List any three of them.

24. How does the metagenomics approach help to identify novel genes present in the environment? Explain the process.

25. What are somatic hybrids? How are they produced?

   OR

   Though a genetically engineered crop is herbicide and pesticide resistant, it still requires use of agro chemicals. Mention at least three facts to justify the statement.
SECTION-D

26. Why do ddNTP’s cause chain termination during Sanger’s DNA sequencing method? Write the DNA fragments formed by chain termination for the given original DNA strand-3’ ATGCTAGC 5’.

OR

Distinguish between:
(i) BAC and YAC
(ii) pBR322 & pUC19
(iii) M-13 & lambda phage
(iv) Cosmid & plasmid
(v) Transformation and transfection

27. What is the hierarchical organization of protein structure? Indicate the nature of covalent and non-covalent forces which determine the protein structure.

OR

How can one use the method of aqueous-two phase partitioning for the separation of proteins? Also suggest various efforts which may be taken to maximize protein stability during such separation.

28. Indicate the inheritance pattern, genomic location and mutation in any two diseases caused by single gene mutations which follow mendelian inheritance. Also, specify the genomic location in any two diseases resulting from gene polymorphisms with complex inheritance.
## General Instructions:
1) This question paper contains two parts- A and B.
2) All parts of a question should be attempted at one place.

### Part – A
**Accounting for Not-for-Profit Organizations, Partnership Firms and Companies**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Land and Building (book value) ₹ 1,60,000 sold for ₹ 3,00,000 through a broker who charged 2% commission on the deal. Journalise the transaction, at the time of dissolution of the firm.</td>
<td>1</td>
</tr>
<tr>
<td>2. Why is it necessary to revalue assets and liabilities of a firm in case of admission of a partner?</td>
<td>1</td>
</tr>
<tr>
<td>Or State any two reasons for the preparation of ‘Revaluation Account’ at time of admission of a partner.</td>
<td></td>
</tr>
<tr>
<td>3. State the basis of accounting on which ‘Receipt and Payment Account’ is prepared in case of Not-for Profit Organisation.</td>
<td>1</td>
</tr>
<tr>
<td>Or What will be the treatment of ‘Subscription received in advance’ during the current year in the Balance Sheet of a Not-For-Profit Organisation?</td>
<td></td>
</tr>
<tr>
<td>4. One of the partners in a partnership firm has withdrawn ₹ 9,000 at the end of each quarter, throughout the year. Calculate interest on drawings at the rate of 6% per annum.</td>
<td>1</td>
</tr>
<tr>
<td>5. A, B and C are partners in a firm sharing profit and losses in the ratio of 3:2:1. B died on 1st April, 2018. C, son of B, is of the opinion that he is the rightful owner of his father’s share of profits, and the profits of the firm should be now shared between A and C equally. A does not agree. Settle the dispute between A and C by giving reason.</td>
<td>1</td>
</tr>
<tr>
<td>6. Differentiate between ‘Equity Share’ and ‘Debenture’ on the basis of risk involved.</td>
<td>1</td>
</tr>
<tr>
<td>Or What is meant by ‘Employee Stock Option Plan’?</td>
<td></td>
</tr>
</tbody>
</table>
On April 1, 2018, a firm had assets of ₹1,00,000 excluding stock of ₹20,000. The current liabilities were ₹10,000 and the balance constituted Partners’ Capital Accounts. If the normal rate of return is 8%, the Goodwill of the firm is valued at ₹60,000 at four years purchase of super profit, find the actual profits of the firm.

Jan Dhan Bank, an All India Financial Institution, had 10,000, 12% debentures of ₹100 each, outstanding as at 31st March, 2017. These debentures were due for redemption on 30th June, 2018. Pass necessary Journal Entries for redemption of debentures. Also, state the amount of Debenture Redemption Reserve to be created for the purpose of redemption.

Complete the following Journal Entries

<table>
<thead>
<tr>
<th>Date</th>
<th>Particulars</th>
<th>L.F.</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Sundry Assets A/c Dr</td>
<td></td>
<td>25,00,000</td>
</tr>
<tr>
<td>April 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To Sundry Liabilities A/c</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To Shiv Shankar Ltd.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Being Shiv Shankar Ltd. was taken over by Parvati Ltd. for a purchase consideration of ₹18,20,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shiv Shankar Ltd. Dr</td>
<td></td>
<td>18,20,000</td>
</tr>
<tr>
<td></td>
<td>Dr</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To 8% Debentures A/c</td>
<td></td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td>(For paying Shiv Shankar Ltd. by issuing a bill of ₹20,000 and the balance was paid by issue of 8% Debentures of ₹100 each at a discount of 10%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S. Singh Limited obtained a loan of ₹5,00,000 from State Bank of India @ 10% interest. The company issued ₹7,50,000, 10% debentures of ₹100/- each, in favor of State Bank of India as collateral security. Pass necessary journal entries for the above transactions:

i. When company decided not to record the issue of 10% Debentures as collateral security.

ii. When company decided to record the issue of 10% Debentures as collateral security.
Calculate the amount of sports material to be transferred to Income and Expenditure account of Raman Bhalla Sports Club, Ludhiana, for the year ended 31st March, 2018:

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Sports Material sold during the year (Book Value ₹ 50,000)</td>
<td>56,000</td>
</tr>
<tr>
<td>ii. Amount paid to creditors for sports material</td>
<td>91,000</td>
</tr>
<tr>
<td>iii. Cash purchase of sports material</td>
<td>40,000</td>
</tr>
<tr>
<td>iv. Sports material as on 31.3.17</td>
<td>50,000</td>
</tr>
<tr>
<td>v. Sports Material as on 31.3.18</td>
<td>55,000</td>
</tr>
<tr>
<td>vi. Creditors for sports material as on 31.3.17</td>
<td>37,000</td>
</tr>
<tr>
<td>vii. Creditors for sports material as on 31.3.18</td>
<td>45,000</td>
</tr>
</tbody>
</table>

Bhavya and Sakshi are partners in a firm, sharing profits and losses in the ratio of 3:2. On 31st March, 2018 their Balance Sheet was as under:

Balance Sheet of Bhavya and Sakshi
As at 31st March, 2018

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Amount (₹)</th>
<th>Assets</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sundry Creditors</td>
<td>13,800</td>
<td>Furniture</td>
<td>16,000</td>
</tr>
<tr>
<td>General Reserve</td>
<td>23,400</td>
<td>Land and Building</td>
<td>56,000</td>
</tr>
<tr>
<td>Investment Fluctuation Fund</td>
<td>20,000</td>
<td>Investments</td>
<td>30,000</td>
</tr>
<tr>
<td>Bhavya’s Capital</td>
<td>50,000</td>
<td>Trade Receivables</td>
<td>18,500</td>
</tr>
<tr>
<td>Sakshi’s Capital</td>
<td>40,000</td>
<td>Cash in Hand</td>
<td>26,700</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,47,200</strong></td>
<td><strong>Total</strong></td>
<td><strong>1,47,200</strong></td>
</tr>
</tbody>
</table>

The partners have decided to change their profit sharing ratio to 1:1 with immediate effect. For the purpose, they decided that:

a. Investments to be valued at ₹ 20,000
b. Goodwill of the firm valued at ₹ 24,000
c. General Reserve not to be distributed between the partners.

You are required to pass necessary journal entries in the books of the firm. Show workings.

Dinesh, Alvin and Pramod are partners in a firm sharing profits and losses in the ratio of 5:3:2. Their Balance Sheet as at March 31, 2018 was as follows:

Balance Sheet of Dinesh, Alvin and Pramod
As at 31st March, 2018

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Amount (₹)</th>
<th>Assets</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sundry Creditors</td>
<td>50,000</td>
<td>Debtors</td>
<td>15,000</td>
</tr>
<tr>
<td>General Reserve</td>
<td>40,000</td>
<td>Fixed Assets</td>
<td>67,000</td>
</tr>
<tr>
<td>Bills Payable</td>
<td>10,000</td>
<td>Investments</td>
<td>40,000</td>
</tr>
<tr>
<td>Dinesh’s Capital</td>
<td>30,000</td>
<td>Stock</td>
<td>25,500</td>
</tr>
<tr>
<td>Alvin’s Capital</td>
<td>40,000</td>
<td>Cash in Hand</td>
<td>36,000</td>
</tr>
<tr>
<td>Pramod’s Capital</td>
<td>30,000</td>
<td>Deferred Revenue</td>
<td>14,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expenditure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dinesh’s Loan Account</td>
<td>2,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,00,000</strong></td>
<td><strong>Total</strong></td>
<td><strong>2,00,000</strong></td>
</tr>
</tbody>
</table>

Dinesh died on July 1, 2018. The executors of Dinesh are entitled to:

i. His share of goodwill. The total goodwill of the firm valued at ₹ 50,000.
ii. His share of profit up to his date of death on the basis of actual sales till date of death. Sales for the year ended March 31, 2018 was ₹ 12,00,000 and profit for
the same year was ₹ 2,00,000. Sales shows a growth trend of 20% and percentage of profit earning remains the same.

iii. Investments were sold at par. Half of the amount due to Dinesh was paid to his executors and for the balance, they accepted a Bills Payable. Prepare Dinesh’s Capital account to be rendered to his executors.

13

Prepare Income and Expenditure Account from the following particulars of Youth Club for the year ended on 31st March, 2018:

<table>
<thead>
<tr>
<th>Receipts</th>
<th>Amount (₹)</th>
<th>Payments</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Balance b/d</td>
<td>32,500</td>
<td>By Salaries</td>
<td>31,500</td>
</tr>
<tr>
<td>To Subscription</td>
<td></td>
<td>By Postage</td>
<td>1,250</td>
</tr>
<tr>
<td>2016-17</td>
<td>1,500</td>
<td>By Rent</td>
<td>9,000</td>
</tr>
<tr>
<td>2017-18</td>
<td>60,000</td>
<td>By Printing and Stationery</td>
<td>14,000</td>
</tr>
<tr>
<td>2018-19</td>
<td>1,800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Donations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Billiards table)</td>
<td>90,000</td>
<td>By Sports Material</td>
<td>11,500</td>
</tr>
<tr>
<td>To Entrance Fees</td>
<td>1,100</td>
<td>By Miscellaneous Expenses</td>
<td>3,100</td>
</tr>
<tr>
<td>To Sale of old magazines</td>
<td>450</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>By Furniture (1.10.2017)</td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By 10% investment (1.10.2017)</td>
<td>70,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By Balance c/d (31.3.18)</td>
<td>27,000</td>
</tr>
</tbody>
</table>

1,87,350

1,87,350

Additional Information:

i. Subscription outstanding as at March 31st 2018 ₹ 16,200

ii. ₹ 1200 is still in arrears for the year 2016-17 for subscription

iii. Value of sports material at the beginning and at the end of the year was ₹ 3,000 and ₹ 4,500 respectively.

iv. Depreciation to be provided @ 10% p.a. on furniture.

14

Pradeep and Rajesh were partners in a firm sharing profits and losses in the ratio of 3:2. They decided to dissolve their partnership firm on 31st March, 2018. Pradeep was deputed to realize the assets and to pay off the liabilities. He was paid ₹ 1,000 as commission for his services. The financial position of the firm on 31st March, 2018 was as follows:

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Amount (₹)</th>
<th>Assets</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creditors</td>
<td>80,000</td>
<td>Building</td>
<td>1,20,000</td>
</tr>
<tr>
<td>Mrs Pradeep’s Loan</td>
<td>40,000</td>
<td>Investment</td>
<td>30,600</td>
</tr>
<tr>
<td>Rajesh’s loan</td>
<td>24,000</td>
<td>Debtors</td>
<td>34,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less : Provision for</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Doubtful Debts</td>
<td>4,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bills Receivable</td>
<td>37,400</td>
</tr>
<tr>
<td>Investment Fluctuation</td>
<td>8,000</td>
<td>Bank</td>
<td>6,000</td>
</tr>
<tr>
<td>Fund</td>
<td></td>
<td>Profit and Loss A/c</td>
<td>8,000</td>
</tr>
<tr>
<td>Capitals:</td>
<td></td>
<td>Goodwill</td>
<td>4,000</td>
</tr>
<tr>
<td>Pradeep</td>
<td>42,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rajesh</td>
<td>42,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2,36,000

2,36,000
Following terms and conditions were agreed upon:

i. Pradeep agreed to pay off his wife's loan.
ii. Half of the debtor's realized ₹ 12,000 and remaining debtors were used to pay off 25% of the creditors.
iii. Investment sold to Rajesh for ₹ 27,000
iv. Building realized ₹ 1,52,000
v. Remaining creditors were to be paid after two months, they were paid immediately at 10% p.a. discount
vi. Bill receivables were settled at a loss of ₹ 1,400
vii. Realization expenses amounted to ₹ 2,500

Prepare Realization Account.

15

Mudit, Sudhir and Uday are partners in a firm sharing profits in the ratio of 3:1:1. Their fixed capital balances are ₹ 4,00,000, ₹ 1,60,000 and ₹ 1,20,000 respectively. Net profit for the year ended 31st March, 2018 distributed amongst the partners was ₹1,00,000, without taking into account the following adjustments:

a) Interest on capitals @ 2.5% p.a.;
b) Salary to Mudit ₹ 18,000 p.a. and commission to Uday ₹ 12,000
c) Mudit was allowed a commission of 6% of divisible profit after charging such commission.

Pass a rectifying journal entry in the books of the firm. Show workings clearly.

Or

The partners of a firm, Alia, Bhanu and Chand distributed the profits for the year ended 31st March, 2017, ₹ 80,000 in the ratio of 3:3:2 without providing for the following adjustments:

a) Alia and Chand were entitled to a salary of ₹ 1,500 each p.a.
b) Bhanu was entitled for a commission of ₹ 4,000
c) Bhanu and Chand had guaranteed a minimum profit of ₹ 35,000 p.a. to Alia any deficiency to borne equally by Bhanu and Chand.

Pass the necessary Journal entry for the above adjustments in the books of the firm. Show workings clearly.

16

Anshika Ltd. issued applications for 2,00,000 equity shares of ₹10 each, at a premium of ₹4 per share. The amount was payable as follows:

On application ₹ 6 (including ₹2 premium)
On allotment ₹ 7 (including ₹2 premium)
Balance on first and final call

Applications for 3,00,000 shares were received. Allotment was made to all the applicants on pro-rata basis. Mehak to whom 400 shares were allotted, failed to pay allotment and call money. Khushboo who had applied for 300 shares failed to pay call money. These shares were forfeited after Final call. 400 of the forfeited shared (including all shares of Khushboo) were reissued @ ₹8 per share as fully paid up. Pass necessary journal entries in the books of Anshika Ltd. for the above transactions by opening calls in arrears and calls in advance account wherever necessary.

Or
Khyati Ltd. issued a prospectus inviting applications for 80,000 equity shares of ₹10 each payable as follows:
- ₹2 on application
- ₹3 on allotment
- ₹2 on first call
- ₹3 on final call

Applications were received for 1,20,000 equity shares. It was decided to adjust the excess amount received on account of over subscription till allotment only. Hence allotment was made as under:
(i) To applicants for 20,000 shares – in full
(ii) To applicants for 40,000 shares – 10,000 shares
(iii) To applicants for 60,000 shares – 50,000 shares

Allotment was made and all shareholders except Tammana, who had applied for 2,400 shares out of the group (iii), could not pay allotment money. Her shares were forfeited immediately, after allotment. Another shareholder Chaya, who was allotted 500 shares out of group (ii), failed to pay first call. 50% of Tamanna’s shares were reissued to Satnam as ₹7 paid up for payment of ₹9 per share.

Pass necessary journal entries in the books of Khyati Ltd. for the above transactions by opening calls in arrears and calls in advance account wherever necessary.

Divya, Yasmin and Fatima are partners in a firm, sharing profits and losses in 11:7:2 respectively. The balance sheet of the firm as on 31st March 2018 was as follows:

**Balance Sheet**  
*As at 31.3.2018*

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Amount (₹)</th>
<th>Assets</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sundry Creditors</td>
<td>70,000</td>
<td>Factory Building</td>
<td>7,35,000</td>
</tr>
<tr>
<td>Public Deposits</td>
<td>1,19,000</td>
<td>Plant and Machinery</td>
<td>1,80,000</td>
</tr>
<tr>
<td>Reserve fund</td>
<td>90,000</td>
<td>Furniture</td>
<td>2,60,000</td>
</tr>
<tr>
<td>Outstanding Expenses</td>
<td>10,000</td>
<td>Stock</td>
<td>1,45,000</td>
</tr>
<tr>
<td>Capital accounts</td>
<td></td>
<td>Debtors</td>
<td>1,50,000</td>
</tr>
<tr>
<td>Divya</td>
<td>5,10,000</td>
<td>Less: Provision (30000)</td>
<td>1,20,000</td>
</tr>
<tr>
<td>Yasmin</td>
<td>3,00,000</td>
<td>Cash at bank</td>
<td>1,59,000</td>
</tr>
<tr>
<td>Fatima</td>
<td>5,00,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td><strong>15,99,000</strong></td>
<td><strong>Total Assets</strong></td>
<td><strong>15,99,000</strong></td>
</tr>
</tbody>
</table>

On 1.4.2018, Aditya is admitted as a partner for one-fifth share in the profits with a capital of ₹4,50,000 and necessary amount for his share of goodwill on the following terms:

i. Furniture of ₹2,40,000 were to be taken over Divya, Yasmin and Fatima equally.

ii. A creditor of ₹7,000 not recorded in books to be taken into account.

iii. Goodwill of the firm is to be valued at 2.5 years purchase of average profits of last two years. The profit of the last three years were:

2015-16 ₹6,00,000; 2016-17 ₹2,00,000; 2017-18 ₹6,00,000

iv. At time of Aditya’s admission Yasmin also brought in 50,000 as fresh capital

v. Plant and Machinery is re-valued to ₹2,00,000 and expenses outstanding were brought down to ₹9,000. Prepare Revaluation Account, Partners Capital Account and the balance sheet of the reconstituted firm.

Or
The Balance Sheet of Adil, Bhavya and Cris as at 31st March 2018 was as under:

**Balance Sheet**
As at 31.3.18

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Amount (₹)</th>
<th>Assets</th>
<th>Amount (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Accounts:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adil</td>
<td>40,000</td>
<td>Buildings</td>
<td>1,20,000</td>
</tr>
<tr>
<td>Bhavya</td>
<td>30,000</td>
<td>Motor car</td>
<td>18,000</td>
</tr>
<tr>
<td>Cris</td>
<td>20,000</td>
<td>Stock</td>
<td>20,000</td>
</tr>
<tr>
<td>General Reserve</td>
<td>10,000</td>
<td>Investments</td>
<td>20,000</td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td>Debtors</td>
<td>40,000</td>
</tr>
<tr>
<td>Fluctuation Reserve</td>
<td>7,000</td>
<td>Cash at Bank</td>
<td>12,000</td>
</tr>
<tr>
<td>Sundry creditors</td>
<td>1,23,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>2,30,000</strong></td>
</tr>
</tbody>
</table>

The partners share profits in the ratio of 5:3:2. On 1-4-2018, Cris retires from the firm on the following terms and conditions:

i. 20% of the General Reserve is to remain as a reserve for bad and doubtful debts
ii. Motor car is to be reduced by 5%
iii. Stock is to be revalued at ₹ 17,500 and investment to be re-valued at ₹ 18,000
iv. Goodwill is to be valued at 3 years’ purchase of the average profits of last 4 years. Profits of the last four years were:

2014-15 ₹13,000; 2015-16 ₹11,000; 2016-17 ₹16,000 and 2017-18 ₹24,000

Cris was paid in full. Adil and Bhavya borrowed the necessary amount from the Bank on the security of Building to pay off Cris.

Pass necessary journal entries.

**Part B: Analysis of Financial Statements**

**Option-I**

18 Under which type of activity will you classify ‘Rent received’ while preparing cash flow statement?

19 State any one advantage of preparing Cash Flow Statement.

20 Under which major heads and subheads of the Balance Sheet of a company, will the following items be shown:-
   i) Loose Tools
   ii) Retirement Benefits Payable to employees
   iii) Patents
   iv) Interest on Calls in Advance

21 Calculate amount of Opening Trade Receivables and Closing Trade Receivables from the following figures:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Receivable Turnover ratio</td>
<td>5 times</td>
<td></td>
</tr>
<tr>
<td>Cost of Revenue from Operations</td>
<td>₹ 8,00,000</td>
<td></td>
</tr>
<tr>
<td>Gross Profit ratio</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Closing Trade Receivables were ₹ 40,000 more than in the beginning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash sales being ¼ times of Credit sales</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the following data, calculate Current ratio and Liquid Ratio

<table>
<thead>
<tr>
<th>Description</th>
<th>₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Assets</td>
<td>75,000</td>
</tr>
<tr>
<td>Inventories (Includes Loose Tools of ₹20,000)</td>
<td>35,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>10,000</td>
</tr>
<tr>
<td>Working Capital</td>
<td>60,000</td>
</tr>
</tbody>
</table>

From the following Balance Sheet of R Ltd., Prepare a Common Size Statement
Balance Sheet As at 31st March, 2018.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Note no.</th>
<th>31.3.2018 (₹)</th>
<th>31.3.2017 (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I EQUITY AND LIABILITIES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Shareholder’s Funds:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Share Capital</td>
<td></td>
<td>2,50,000</td>
<td>2,00,000</td>
</tr>
<tr>
<td>b. Reserve and Surplus</td>
<td></td>
<td>80,000</td>
<td>60,000</td>
</tr>
<tr>
<td>2. Current Liabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Trade Payable</td>
<td></td>
<td>70,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4,00,000</td>
<td>3,00,000</td>
</tr>
<tr>
<td>II ASSETS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Non-Current Assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Fixed Assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Tangible Assets</td>
<td></td>
<td>1,60,000</td>
<td>1,20,000</td>
</tr>
<tr>
<td>ii. Intangible Assets</td>
<td></td>
<td>20,000</td>
<td>30,000</td>
</tr>
<tr>
<td>2. Current Assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Inventories</td>
<td></td>
<td>80,000</td>
<td>30,000</td>
</tr>
<tr>
<td>b. Trade Receivables</td>
<td></td>
<td>1,20,000</td>
<td>1,00,000</td>
</tr>
<tr>
<td>c. Cash and Cash Equivalents</td>
<td></td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4,00,000</td>
<td>3,00,000</td>
</tr>
</tbody>
</table>

From the following Statement of Profit and Loss of the Sakhi Ltd. for the year ended 31st March 2018, prepare Comparative Statement of Profit & Loss.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>2016-17 (₹)</th>
<th>2017-18(₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue from Operations</td>
<td>25,00,000</td>
<td>40,00,000</td>
</tr>
<tr>
<td>Expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Employee benefit expenses</td>
<td>7,00,000</td>
<td>10,00,000</td>
</tr>
<tr>
<td>b) Other Expenses</td>
<td>3,00,000</td>
<td>2,00,000</td>
</tr>
<tr>
<td>Rate of Tax - 40%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the following Balance Sheets of Vishva Ltd., prepare Cash Flow Statement as per AS-3 (revised) for the year ending 31st March, 2018

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Note No.</th>
<th>31.3.2018 (₹)</th>
<th>31.3.2017 (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I EQUITY AND LIABILITIES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Shareholder’s Funds:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Share Capital</td>
<td></td>
<td>1,02,000</td>
<td>84,000</td>
</tr>
<tr>
<td>b. Reserve and Surplus</td>
<td></td>
<td>36,000</td>
<td>22,560</td>
</tr>
<tr>
<td>2. Non-Current Liabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Part B: Computerised Accounting

<table>
<thead>
<tr>
<th>Option II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Which function is used to compute loan repayment schedule?</td>
</tr>
<tr>
<td>19</td>
<td>What is data validation?</td>
</tr>
<tr>
<td>20</td>
<td>Differentiate between desktop database and server database.</td>
</tr>
<tr>
<td>21</td>
<td>Explain the steps in installation of computerised accounting system.</td>
</tr>
<tr>
<td>Question</td>
<td>Marks</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Give any four features of computerized accounting system.</td>
<td>4</td>
</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>Give any four limitations of computerized accounting system</td>
<td></td>
</tr>
<tr>
<td>Explain any six features of Tally 9.0 software.</td>
<td>6</td>
</tr>
</tbody>
</table>
**Class – XII**  
**Business Studies**  
**Sample Question Paper 2018-19**  

**MM: 80**  
**Time Allowed: 3 hours**

<table>
<thead>
<tr>
<th>Section A</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>“Successful organizations do not achieve their goals by chance but by following a deliberate process”. Identify the process highlighted here.</td>
</tr>
<tr>
<td>2</td>
<td>Distinguish between Delegation and Decentralization on the basis of freedom of action.</td>
</tr>
<tr>
<td>Or</td>
<td>Distinguish between Authority and Responsibility on the basis of Origin.</td>
</tr>
<tr>
<td>3</td>
<td>Name the process of stimulating and inspiring people at work to accomplish desired objectives.</td>
</tr>
<tr>
<td>Or</td>
<td>Name the ‘on-the-job’ method of training that is used to give training to plumbers.</td>
</tr>
<tr>
<td>4</td>
<td>Define Marketing Management.</td>
</tr>
<tr>
<td>Or</td>
<td>Define ‘Grading’ as a function of marketing.</td>
</tr>
<tr>
<td>5</td>
<td>Mohit purchased a smart phone for ₹30,000 from a mobile phone seller on his verbal commitment that the smart phone will be replaced in case of any defect, within a span of six months. The phone started creating technical issues in spite of proper maintenance and upkeep of the phone. The seller denied taking any action on the complaint made by Mohit. Name the redressal agency under the Consumer protection Act where Mohit can file his complaint.</td>
</tr>
<tr>
<td>6</td>
<td>‘The size of assets, the profitability and competitiveness are affected by one of the financial decisions’. State the decision involved with reference to the given statement.</td>
</tr>
<tr>
<td>7</td>
<td>In an organization, employees always feel that they are under enormous unnecessary stress, as the manager does not provide any information about future plans but simply instructs them what to do. He also does not listen to any of the suggestions given by the subordinates. Identify the type of leadership style followed by the manager in the above situation.</td>
</tr>
<tr>
<td>8</td>
<td>Mr. Mohan, Financial manager of ABC Ltd., has prepared the annual Statement of proposed expenditure to be presented in the Annual General Meeting. Identify the type of plan formulated by the financial manager.</td>
</tr>
</tbody>
</table>
Section B

9
State any three points of importance of directing function of management.

Or
State any three measures to overcome the communication barriers.

10
Rahul decided to start a desert cooler manufacturing business. He sets the target of earning 20% profit on sales in the first year. He was very much concerned about the future prospects of the business, which were uncertain. For this, he gathered information from the potential market and analyzed that the demand for wall mounted coolers is increasing day by day. He used this information as the base for future planning. On the basis of the gathered information, he called a meeting in the following week to find new methods to achieve the objective.
   a) Identify the function of management involved in the above case.
   b) Enumerate the next two steps, which have been followed by Rahul that are related to the process of one of the functions of management.

11
“The overall objective of SEBI is to protect the interest of investors and to promote the development of, and regulate the securities market.” In light of the given statement, state any three objectives of SEBI.

OR

“Financial markets play an important role in the allocation of scarce resources in an economy by performing important functions.” In light of the given statement, state any three functions performed by Financial Market.

12
‘Delegation is not a process of abdication.’ Comment

13
Mr. Rohit is into transport business. His buses are hired by schools for transportation of students. He is willing to expand and diversify his business to inter-state transportation purposes. Enumerate any six factors that will affect his fixed capital requirements.

Section C

14
The Government of India has recently come up with an amendment to Section 6 of the Payment of Wages Act 1936, to allow employers of certain industries to make payment through various electronics modes of payments. The amendment will be applicable to all the public sector undertakings for wages disbursement using e-payment options. This is another milestone in the direction to further push to cashless economy. Identify and explain any two dimensions of business environment which relate to the above mentioned case.
15 State any four differences between Primary market and Secondary Market.

Or

Differentiate between Capital Market and Money Market on the basis of:
(a) Liquidity (b) Duration
(c) Expected Return (d) Safety

16 Aarushi buys a packet of dry cake from a cake shop without asking for the bill. The pack does not bear any information other than the name of the shop. After reaching home she finds the cake to be stale.
   a) Identify the consumer right that has been violated.
   b) State any three responsibilities that a consumer must keep in mind while purchasing any good.

17 State any four characteristics of good brand name.

Or

State any four functions of Packaging.

18 Kavita recently joined as the human resource director of Arjun Vidyamandir School, a senior secondary educational institute. She observed that the school had an experienced medical team on its payroll. They regularly offered useful suggestions which were neither appreciated nor rewarded by the school authorities. Instead the school outsourced the task of maintenance of health records of the students and paid them a good compensation for their services. Because of this, the existing medical team felt disheartened and stopped giving useful suggestions.
   a) Identify the communication barrier discussed above.
   b) State the category of this communication barrier.
   c) Explain any other two communication barriers of the same category.

19 Sherya Ltd. is a large credit-worthy company manufacturing automobiles for the Indian market. It now wants to cater to the other market and decided to invest in new machines. For this, it requires long-term finance. It decides to raise funds by issuing equity shares. The issue of equity shares involves huge floatation cost. To meet the expenses of floatation cost the company decides to tap the money market.
   a) Name and discuss the money market instrument the company can use for the above purpose.
   b) What is the duration for which the company can get funds through this instrument?
   c) State any other purpose for which this instrument can be used.

Section D

20 Identify the technique of sales promotion used by the company in the following cases:
(a) Purchase goods worth ₹ 90,000 and get a holiday package of ₹10,000 free.
(b) A company offers 40% of extra glucose in a pack of 1 Kg.
(c) A mobile company offers a discount of ₹2,000 to clear off excess inventory.
(d) A company offers a pack of 1 Kg of tea with a purchase of 5 kgs of sugar
(e) On return of the wrapper, a customer gets ₹5 off on purchase of the same product.

<table>
<thead>
<tr>
<th>21</th>
<th>State any five functions performed by the manager who is working at the middle level management.</th>
</tr>
</thead>
</table>
| 22 | Rudrakshi Ltd. is engaged in manufacturing high end luxury pens. The target production is 700 units daily. The company had been successfully attaining this target until three months ago. Over the last few month, it has been observed that daily productions varies between 600-650 units.  
   I. Identify the function of management, which has been highlighted in the above context.  
   II. Discuss the first four steps involved in the process of the function identified above. |

**Section E**

<table>
<thead>
<tr>
<th>23</th>
<th>Differentiate between Functional structure and Divisional structure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>A public transport corporation has hired 2000 buses for the different routes for the passengers of metropolitan city. In order to fill vacancies, it advertised in the newspaper and number of applicants applied for the same. The company has to now undertake the process of selection to identify and select the best. Explain the first six steps involved in the process.</td>
</tr>
</tbody>
</table>
| 25 | Flavours Ltd. was engaged in the business of making handmade chocolates. Lately, the business was expanding due to good quality and reasonable prices. As the demand was increasing, Flavours Ltd. decided to explore bakery products as well. In order to make bakery products the company directed its workforce to work overtime but this resulted in multiple problems.  
   Due to increased pressure the efficiency declined and the workers had to take orders from more than one superior. Workers were overburdened and their health was also affected. Gradually the quality of the products begins to decline and market share also went down. The company realized that they had implemented changes without waiting for the required infrastructure.  
   Identify and explain the principles/technique of Taylor/Fayol referred to in the above para. |
## Class XII
Economics (030)
Sample Question Paper 2018-19

<table>
<thead>
<tr>
<th>Question_number</th>
<th>Question</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>State the reason why Total Variable Cost (TVC) curve and Total Cost (TC) curve are parallel to each other.</td>
<td>1</td>
</tr>
<tr>
<td>Or</td>
<td>State the reason behind U-shape nature of Average Variable Cost curve.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>If the Total Revenue of a firm increases by ₹ 45,000 due to an increase in sale of Good X from 50 units to 65 units, then marginal revenue will be ₹.........................?</td>
<td>1</td>
</tr>
</tbody>
</table>
| 3               | A Production Possibility Curve would be...................................... curve if all the available resources in an economy are equally efficient to produce both the goods. (Choose the correct alternative)  
  a) a straight line  
  b) convex to origin  
  c) concave to origin  
  d) upward sloping | 1      |
| 4               | Which of the following is a variable cost?                                                          | 1      |
| Or              | If Total Variable Cost and Total Fixed Cost of producing 10 units are ₹500 & ₹200, the value of average cost would be?  
  a) 50  
  b) 70  
  c) 20  
  d) 80 |        |
| 5               | Distinguish between Normative Economics and Positive Economics, with suitable examples.            | 3      |
| Or              | Why do central problems arise? Discuss briefly.                                                     |        |
| 6               | Mr. Atal Singh is consuming two goods X and Y. If he is facing a situation of \( \frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} \), discuss how would he reach the level of equilibrium. | 3      |
7. Calculate and comment on nature of price elasticity of demand, if, with a rise in price of Good X from ₹ 10 to ₹ 12, the quantity demanded falls by 40%.

Or

‘As the price of a good falls, the resulting increased purchasing power may be a reason for increase in quantity demanded’. Do you agree with the given statement? Give reason for your answer.

8. Complete the following production schedule:

<table>
<thead>
<tr>
<th>Units of variable input</th>
<th>Total Physical Product (units)</th>
<th>Average Physical Product (units)</th>
<th>Marginal Physical Products (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>--</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>--</td>
<td>--</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>--</td>
<td>-5</td>
</tr>
</tbody>
</table>


Or

Why number of firms is limited in an oligopoly market? Explain.

10. a) Explain with the help of a hypothetical numerical example the assumption of diminishing marginal rate of substitution under the ordinal approach of theory of consumer’s behaviour.
    b) Why should marginal rate of substitution diminish for a stable consumer’s equilibrium?

11. Suppose the market for Good X is in equilibrium. Explain the chain effect, if:
    a) increase in market demand is less than the decrease in market supply.
    b) increase in market demand is more than the increase in market supply.

12. Examine the effects of the following on the supply curve of a Good X, using suitable diagram:
    a) fall in own price of Good X.
    b) rise in price of factor input producing Good X.

Or

Define Producer’s Equilibrium. Discuss briefly, the conditions of producer’s equilibrium, assuming that the producer can sell more units of the good by lowering the price.

SECTION B – MACROECONOMICS

13. Calculate the value of money multiplier if the legal reserve requirements are 20%.

14. What is money supply?

Or

What is meant by Reverse Repo Rate?
15. (choose the correct alternative) is a revenue receipt of the government.
   a) Funds raised by the government by issuing National Saving Certificates
   b) Sale of 40% shares of a public sector undertaking to a private enterprise
   c) Profits of LIC, a public enterprise
   d) Amount borrowed from Japan for construction of Bullet Train.

16. Identify which of the following statements is true?
   a) Fiscal deficit is difference between planned revenue expenditure and planned revenue receipts
   b) Fiscal deficit is difference between total planned expenditure and total planned receipts
   c) Primary deficit is the difference between total planned receipt and interest payments.
   d) Fiscal deficit is the sum of primary deficit and interest payment.

17. Estimate the value of Aggregate Demand in an economy if:
   a) Autonomous Investment (I) = ₹100 Crore.
   b) Marginal Propensity to Save = 0.2
   c) Level of Income (Y) = ₹4,000 crores.
   d) Autonomous Consumption Expenditure (c) = ₹50 Crore

   Or

   In an economy C= 200 + 0.5 Y is the consumption function where C is the consumption expenditure and Y is the national income. Investment expenditure is ₹400 crores. Is the economy in equilibrium at an income level ₹1500 crores? Justify your answer.

18. Explain how the level of effective demand is attained in an economy if, Aggregate Demand is more than the Aggregate Supply.

19. What is meant by problem of double counting? How this problem can be avoided?

   Or

   Discuss briefly, the circular flow of income in a two sector economy with the help of a suitable diagram.

20. Elaborate ‘economic growth’ as objective of government budget.

21. How the following tools can be used for credit control by the central bank in an economy:
   a) Open Market Operations
   b) Margin Requirements
22  a) State any two precautions that must be taken into consideration while estimating national income by value added method.
   b) In an economy, following transactions took place. Calculate value of output and value added by Firm B:
      i. Firm A sold to firm B goods of ₹ 80 crore; to firm C ₹ 50 crore; to household ₹ 30 crore and goods of value ₹ 10 crore remains unsold
      ii. Firm B sold to firm C goods of ₹ 70 crore; to firm D ₹ 40 crore; goods of value ₹ 30 crore were exported and goods of value ₹ 5 crore was sold to government.

   Or

   Differentiate between National Income at Current Prices and National Income at Constant Prices. Which of the two presents a better view of the economic growth of economy and why?

23  How an initial increase in investment affects the level of final income of the economy? Show its working with a suitable numerical example.

24  a) According to recent media reports:
    ‘USA has accused China of currency devaluation to promote its exports’.
    In the light of the given media report comment, how exports can be promoted through the Currency devaluation?

   b) What is meant by Current Account Deficit (CAD) and Current Account Surplus (CAS)? State their significance.
General Instructions:

(i) All questions are compulsory.
(ii) There are in all 25 questions.
(iii) Question nos. 1-6 are for 1 mark, to be answered in one or two lines.
(iv) Question nos. 7-13 are of 2 marks, to be answered in 10-20 words.
(v) Question nos. 14-15 are of 3 marks, to be answered in 20-30 words.
(vi) Question nos. 16-21 are of 4 marks, to be answered in 30-50 words.
(vii) Question nos. 22-25 are of 5 marks, to be answered in 60-100 words.
(viii) Support your answer with suitable examples and figures wherever required.

Section - A

1. Write any two cognitive changes in 16 year old boy.  

OR  

Find any two emotional changes in a 15 year old girl.

2. Suggest any two food items for an obese lactating mother

3. List any two ways of bringing harmony in a dress of a two year old child.

4. Mention any two advantages of using electric water filter at home.

5. Identify any two effects of cool colour on the personality of a person.

OR  

Judge any two qualities in a bed sheet in relation to its durability.

6. Write any two ways of increasing savings.

Section - B

7. In what four ways you can modify the diet of an adolescent girl.

OR  

Suggest a low cost lunch for an adolescent boy.

8. Write down two positive and two negative impact of media on the identity of adolescents.

9. Write the full form of DWCRA. What should be the annual income of a family benefitted from DWRCA.
10. Your classmate has started bunking classes because of peer pressure. In what four ways you can help your friend.

   OR

   “Sex education should be provided in schools”. Justify the statement with the help of two reasons.

11. List down four ways in which you can contribute to the various programmes of social welfare and community development of the country after receiving Home Science education?

12. How will you identify a good soap? Give two advantages of washing clothes with soap.

13. Explain the method of applying starch to stiffen cotton saree.

   OR

   Write four important points to be considered for storing heavy zari suit.

Section – C

14. Instruct your friend who is going to hostel of necessary precautions she should take while laundering her woolen jackets.

15. Write any four advantages of saving money. What two factors your father should consider while choosing a long term scheme?

   OR

   Your uncle wants to invest money in Public Provident Fund. Guide him three advantages and three disadvantages of this scheme.

Section – D

16. Radhika wants to make a weekly expenditure diary. But she does not know the format of the same. Help her in making the format and also explain any four advantages of maintaining record of expenditure.

17. Your sister is going to get married and she wants to buy jewelry and cosmetics for herself. Which two standard marks she should check before buying and also suggest any three buying tips for each, which she should follow.

   OR

   You mother purchased a double door refrigerator online (internet). She found some problem with the functioning of the refrigerator, Company refused to change it. Explain her the procedure to file a complaint in Consumer Court.

18. What is the optimum temperature for the growth of bacteria? What six guidelines will you give to your food handler for storing food in refrigerator?
19. What do you mean by the term adulteration? Name two adulterant found in spices. What four precautions one should follow while purchasing spices?

OR

Name one adulterant you will found in besan flour and besan burfi respectively. Write two health hazards of each and what four precautions one should take while buying the food item.

20. Age influence the selection of clothing”. Explain with two suitable examples. What four points you will keep in mind while buying Salwar Kameez for your grandmother?

21. Sixteen your old Deesha is not taking interest in any class activities and remains isolated. What could be the possible reason for it? Write any three causes and three symptoms of this problem.

Section – E

22. Your father has recently retired from his job. He has started getting angry on small issues frequently. Identify five causes of his anger and suggest five strategies to handle the situation.

23. Mrs. Sharma is the mother of six months old boy. Suggest three ways she can take care of her diet along with appropriate reason. Write down four points she should consider while introducing weaning food to her child.

OR

Educate your pregnant cousin who lives in rural area about the importance of adding proteins and calcium in her diet. How much additional proteins and calcium is required by her? Write two sources of each nutrient.

24. What do you understand by real income? Define its two types and two ways of increasing this income.

25. Write down any two criteria of each to check the quality of Hem, Seam, Placket, Zipper and Pleats in readymade garments.
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. 

<table>
<thead>
<tr>
<th>SECTION – A</th>
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<tbody>
<tr>
<td>1</td>
<td>Define Endurance.</td>
</tr>
<tr>
<td>2</td>
<td>What is food intolerance?</td>
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<tr>
<td>3</td>
<td>Define Asana.</td>
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<td>4</td>
<td>Mention any one cause of ODD.</td>
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<td>Or</td>
<td>What is seeding?</td>
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<td>5</td>
<td>Briefly mention two advantages of Weight Training.</td>
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<tr>
<td>6</td>
<td>What is menstrual dysfunction?</td>
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<td>Or</td>
<td>What do you understand by Diabetes?</td>
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<td>7</td>
<td>Mention the two advantages of Harvard step test.</td>
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<td>8</td>
<td>What is sarcolemma?</td>
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<tr>
<td>Or</td>
<td>Explain the benefits of Pavanmuktasana</td>
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<td>9</td>
<td>Enlist the classification of sports injuries.</td>
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<td>10</td>
<td>Define Projectile.</td>
</tr>
<tr>
<td>Or</td>
<td>Differentiate between gross and fine motor skills</td>
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<tr>
<td>11</td>
<td>Explain the Jung’s classification of personality.</td>
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SECTION – B  

| 12 | Describe the advantages of league tournaments. | 3 |
| Or | How composition of muscle fibers effect speed? | |
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.
(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?

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<td>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. (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?</td>
<td>Mention the sources of carbohydrates.</td>
<td>Explain cognitive disability.</td>
<td>How dislocation can be managed?</td>
<td>Define Trajectory.</td>
<td>Explain the meaning of external motivation.</td>
<td>Describe Fartlek training method.</td>
<td>Draw a fixture of twenty six teams participating in the knockout tournament.</td>
<td>Explain the methods to prevent asthma.</td>
<td>Explain the factors affecting motor development.</td>
<td>Explain in detail on female athletes 'triad.</td>
<td>Explain the Barrow motor ability test.</td>
<td>Explain the physiological factors determining Strength and Speed.</td>
<td>Explain the types of coordinative abilities.</td>
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