# saiphy.com

## 12th Science
## Board Papers - July 2023

# BOARD QUESTION PAPER: JULY 2023
## ENGLISH YUVAKBHARATI

Time: 3 Hrs.                                                    Max. Marks: 80

*Important instructions:*
*(1) Each activity has to be answered in complete sentence/s. One word answers will <u>not</u> be given <u>complete</u> credit. Just the correct activity number written in case of options will <u>not</u> be given credit.*
*(2) Web diagrams, flow charts, tables etc. are to be presented exactly as they are with answers.*
*(3) In point 2 above, just words without the presentation of the activity format/design, will <u>not</u> be given credit. Use of colour pencils/pens etc. is <u>not</u> allowed. (Only blue/black pens are allowed.)*
*(4) Multiple answers to the same activity will be treated as wrong and will <u>not</u> be given any credit.*
*(5) Maintain the sequence of the Sections/ Question Nos./Activities throughout the activity sheet.*

### SECTION – I: PROSE
**(Reading for Comprehension, Language Study, Summary and Mind Mapping)**

**Q.1. (A)  Read the extract and complete the activities given below:**                     (12) **[16]**

Soapy had confidence in himself from the lowest button of his vest upward. He was shaven, and his coat was trim and his neat, black bow had been presented to him by a lady missionary on Thanksgiving Day. If only he could reach a table in the restaurant unsuspected, success would be his. The portion of him that would show above the table would raise no doubt in the waiter's mind. A roasted mallard duck, thought Soapy, would be about the thing with a bottle of wine and then some cheese, a cup of coffee and a cigar. One dollar for the cigar would be enough. The total would not be so high as to call forth any extreme of revenge from the cafe management; and yet the meat would leave him filled and happy for the journey to his winter island.

But as Soapy set foot inside the restaurant door, the head-waiter's eye fell upon his tattered trousers and decadent shoes. Strong and ready hands turned him about and conveyed him in silence and haste to the side-walk and averted the ignoble fate of the menaced mallard.

Soapy turned off Broadway. It seemed that his route to the coveted island was not to be an easy one. Some other way of entering the limbo must be devised.

At a corner of this Sixth Avenue, electric lights and cunningly displayed wares behind plateglass made a shop window attractive. Soapy took a stone and dashed it through the glass. People came running round the corner, a policeman in the lead. Soapy stood still with his hands in his pockets, and smiled at the sight of brass buttons.

"Where's the man that done that?" inquired the officer agitatedly.

"Don't you think that I might have had something to do with it?" said Soapy, with a friendly voice, as one greets good fortune.

**A1.  Read and rewrite the following sentences and state whether they are True or False:**      (2)
(a) A lady missionary has presented Soapy a black bow on Thanksgiving Day.
(b) The head-waiter's eye did not fall upon his tattered trousers and decadent shoes.
(c) A policeman was in the lead when people came running round the corner.
(d) The officer did not inquire about the man who broke the glass.

**A2.  Match the incidents given in column 'A' with the consequences given in column 'B':**      (2)

|    | Column A | Column B |
|----|----------|----------|
| (1) | Soapy tried to enter a cafe. | He stood up slowly beating the dust from his clothes. |
| (2) | Soapy broke a glass window. | He wanted to get arrested by the police |
| (3) | Two waiters pitched Soapy on the callous pavement. | The cop ran after another man. |
| (4) | Soapy stood silent with his hands in his pockets. | Strong and ready hands of the head-waiter turned him around. |

**A3.** **Complete the following sentences:**                                                                (2)
'His route to the coveted island was not to be an easy one.'
(i)     Here 'Island' means _____
(ii)    The island is 'Coveted' because _____

**A4.** **'Students should stay away from crime'.**                                                      (2)
**Write your opinion on the above sentence.**

**A5.** **Do as directed:**                                                                                           (2)
(i)     Soapy turned off Broadway.
(Identify the correct tense form from the following options and rewrite)
(a)     The simple present tense
(b)     The simple past tense
(c)     The present perfect tense
(d)     The past perfect tense

(ii)    'Soapy took a stone and dashed it through the glass.
(Choose the correct alternative to make it a simple sentence)
(a)     Taking a stone Soapy dashed it through the glass.
(b)     Soapy took a stone to dashed it through the glass.
(c)     Soapy has taken a stone to dash it through the glass.
(d)     Soapy takes a stone to dash it through the glass.

**A6.** **Find the synonyms of the following from the extract:**                                  (2)
(i)     jail
(ii)    old and worn out shoes
(iii)   dishonourable
(iv)    nervous manner

**B1.** **Language study-**                                                                                           (4)
**Do as directed:**
(1)     There were no boats to take the people across.                                          (1)
(Identify and rewrite the correct transformation of the above sentence beginning with 'If.....)
(a)     If there were no boats, they wouldn't have taken people across.
(b)     If there were no boats, they would have taken people across.
(c)     If there were boats, they would have taken people across.
(d)     If there were boats, they wouldn't have taken people across.

(2)     He simply abandoned his sack by the stream.                                             (1)
(Identify and rewrite the correct transformation of the above sentence beginning with 'His sack...)
(a)     His sack is abandoned by the stream by him.
(b)     His sack has been abandoned by him by the stream.
(c)     His sack was abandoned by him by the stream.
(d)     His sack had been abandoned by the stream by him.

(3)     She said, "I have worked hard from childhood."                                        (1)
(Identify the correct indirect narration of the above sentence from the given options and rewrite)
(a)     She said that she had worked hard from childhood.
(b)     She said that she has worked hard from childhood.
(c)     She said that she worked hard from childhood.
(d)     She said that she has been working hard from childhood.

**B2.** **Spot the error:**                                                                                          (1)
India pays tribute to Gandhiji for his birth anniversary.

**Q.2. (A)** **Read the following extract and complete the activities given below:**          (12) **[18]**
"This is my birthday, sir," explained Gopal timidly. "Wish you many happy returns,"
said the director promptly and added, "What if it is your birthday?"
"Rather a peculiar birthday," explained Gopal. "This is my forty-ninth birthday.
Astrologers have often told me that I might not see this birthday, and if I lived to see this day

I should have nothing more to worry about, I have lived in secret terror of this day all my life. Whenever I saw my wife and children I used to be racked with the thought that I should probably be leaving them orphans. I came late today because we held some propitiatory rites at home for the planets, and we celebrated my survival this day with a feast. My astrologer has suggested that I do nothing unpleasant today, sir. I wish to treat it as a very auspicious day, sir."

The director was impressed. He turned to his assistant, who always shadowed him, carrying a portfolio under his arm and commanded, "fetch the story-writer". Presently he arrived, his lips red with the chewing of betel leaves. He was a successful story-writer who made a lot of money by dashing off plots for film people. He laughed aloud on hearing of the problem created by the actor. He was not the angry type to feel upset at contrary suggestions. He declared, 'Impossible to change the story. How can he refuse to die? I am busy."

He turned on his heel and started out. At the door he stopped to add, "Anyway, send for our boss and tell him about it." The boss came running into the scene. He asked anxiously "What is all this trouble about? What is it all about?"

Gopal sat in his chair unmoving: he was not allowed to shift his position even slightly; continuity would be spoilt otherwise. He felt stuffy. The big lamp scorched his face. They all stood around and looked at him as if he were a freak. Their faces were blurred beyond the shadows. "All of them are my Yamas," Gopal thought. "They are bent upon seeing me dead."

**A1.** **Arrange the following statements in a proper sequence as per their occurrence in the extract and rewrite:** (2)
(i) The director was impressed.
(ii) Their faces were blurred beyond the shadows.
(iii) Gopal explained timidly that it was his birthday.
(iv) His lips were red with the chewing of betel leaves.

**A2.** **Give reasons:** (2)
(i) Gopal's forty-ninth birthday was a peculiar one because _____
(ii) He felt stuffy because _____

**A3.** **'All of them are my Yamas'. Explain the statement.** (2)

**A4.** **'Superstition poison our minds.' Explain in your own words.** (2)

**A5.** **Do as directed:**
(i) He laughed aloud on hearing of the problem. (1)
(Choose the correct change in the given options, if 'would' is used in the above sentence).
(a) He would laughed on hearing of the problem.
(b) He would have laughed on hearing of the problem.
(c) He would laugh on hearing of the problem.
(d) He would be laughed on hearing of the problem.

(ii) They all stood around and looked at him. (1)
(Choose the correct alternative to write it with 'not only … but also.")
(a) They all not only stood around but also looked at him.
(b) They all stood not only around but also looked at him.
(c) Not only they all stood around but also looked at him.
(d) They all stood not around only but also looked at him.

**A6.** **Find out the antonyms for the following from the extract:** (2)
(i) bravely
(ii) pleasant
(iii) accept
(iv) moving

**(B)** **Summarising:** (3)
Write a 'summary' of the above extract by using the following points.
Gopal's birthday _____ Astrologers' prediction _____. The director's impression_____ The boss _____ Gopal's thought.

**(C)　Mind Mapping:**　　　　　　　　　　　　　　　　　　　　　(3)

Develop a mind map on 'My Future Goals'. Frame / design using your ideas / thoughts / concepts to illustrate.

## SECTION II: POETRY
### (Poetry and Appreciation)

**Q. 3.　(A)　Read the extract and complete the activities given below:**　　　　(10) **[14]**

No stir in the air, no stir in the sea,
The ship was as still as she could be,
Her sails from heaven received no motion,
Her keel was steady in the ocean.

Without either sign or sound of their shock
The waves flow'd over Inchcape Rock;
So little they rose, so little they fell,
They did not move the Inchcape Bell.

The Abbot of Aberbrothok
Had placed that bell on the Inchcape Rock;
On a buoy in the storm it floated and swung.
And over the waves its warning rung.

When the Rock was hid by the surge's swell,
The mariners heard the warning bell;
And then they knew the perilous Rock,
And blest the Abbot of Aberbrothok.

**A1.　Describe the scene in the beginning of the poem.**　　　　　　　　(2)

**A2.　Give reasons:**　　　　　　　　　　　　　　　　　　　　　　(2)
　　(i)　The ship was still at sea because _____
　　(ii)　The Abbot of Aberbrothok had placed the bell on the Inchcape Rock so _____

**A3.　Write two incidents/ occasions on which you helped other people.**　　(2)

**A4.　Give the rhyming pairs and rhyme scheme from stanza 2 from the extract.**　(2)

**A5.　Compose four lines of your own on 'Sea'.**　　　　　　　　　　　(2)

**(B)　Appreciation:**　　　　　　　　　　　　　　　　　　　　　(4)
**Read the extract and write the appreciation of the poem:**
When I had money, money, O!
I knew no joy till I went poor;
For many a false man as a friend
Came knocking all day at my door.

Then felt I like a child that holds
A trumpet that he must not blow
Because a man is dead; I dared
Not speak to let this false world know.

Much have I thought of life, and seen
How poor men's hearts are ever light;
And how their wives do hum like bees
About their work from morn till night.

So, when I hear these poor ones laugh,
And see the rich ones coldly frown
Poor men, think I, need not go up
So much as rich men should come down.

<div align="center">

## SECTION – III
### (Writing Skill)

</div>

**Q.4.** Complete the activities as per the instructions given below:                                    **[16]**

**(A)** Attempt 'Any One' of the following activities:                                                (4)

**(1)** **Drafting a virtual message:**

Imagine, you have been late to attend your 'Piano Class'. Draft a message in about 50 words to convey the same to your Piano teacher. Give your own reasons to support your message.

<div align="center">

**OR**

</div>

**(2)** **Statement of Purpose:**

Imagine after passing the HSC exam, you wish to take admission for a degree course in B.B.A. in a reputed university in India or abroad which would boost your career.

Prepare a statement of purpose in about 150 words which will help you to get admission in your dream university.

<div align="center">

**OR**

</div>

**(3)** **Group Discussion:**

Imagine, you have a great concern for environmental issues. 'Water' is one of the necessities of life. 'No. water, No life.'

You have recently witnessed a group discussion on 'Save Water' participated by three members of water conservationists on TV. Write the same group discussion in the form of dialogues for three participants. Add an evaluator also**.**

**(B)** Attempt 'Any One' of the following activities:                                                (4)

**(1)** **E-mail:**

Draft an E-mail to the owner of 'Sports Store'. As a sportsman, inquire about your requirements and all the possible supporting information that you wish to acquire from the store owner through E-mail. (in about 150 words).

<div align="center">

**OR**

</div>

**(2)** **Report Writing:**

Imagine, your Jr. College has recently organised Annual Prize Distribution Function. 'You are the editor of the 'College Magazine'. Write a report on the function in about 150 words.

<div align="center">

**OR**

</div>

**(3)** Interview:

Imagine, you have to conduct an interview of a well- known writer. With the help of the format given below, draft questions on the given fields. (Do not change the sequence of the questions.)

| |
|---|
| Name of the interviewee: |
|     Field/reputation |
|     Date/venue/time |
|     Duration of interview |
|            Questions |
| Questions based on: |
| (1)   Early life/struggle |
| (2)   Hurdles in education |
| (3)   Role model/inspiration |
| (4)   Family support |
| (5)   First success / achievement |
| (6)   Success plan |
| (7)   Dreams unfulfilled |
| (8)   Message |

<div align="center">

</div>

**(C)** **Attempt 'Any One' of the following activities:** (4)

**(1)** **Speech:**

Imagine you have taken part in an 'Elocution Competition'. You have selected the topic 'Importance of Science and Technology'.

Draft a speech in about 150 words that you wish to deliver before the audience.

**OR**

**(2)** **Compering:**

Imagine, you are given an opportunity to compere a programme 'World Environment Day' in your college. As a compere, draft the whole programme script deciding the flow of the overall programme. You may take help of the given points.

[prayer, welcome, introduction, felicitation, speakers' participation, presidential address, vote of thanks.]

**OR**

**(3)** **Expansion of Idea:**

Expand the following idea with the help of the points given below (100/150 words):

'Actions speak louder than words'

– Focus on actions
– Words are useless where there is no action.
– Actions lead to success / result.

**(D)** **Attempt 'Any One' of the following activities:** (4)

**(1)** **Review:**

You have recently seen a 'Short Film'. Write a 'Review' on the same with the help of the following points:

• Title of the film
• Subject/story/plot
• Presentation/photography/music
• Message

**OR**

**(2)** **Blog:**

Write a 'Blog' in a proper format on 'Personality Development' with the help of the following points (100/ 150 words):

• Need of personality development
• Importance of communication skill
• Aspects of personality development
• Dressing sense

**OR**

**(3)** **Appeal:**

Prepare an 'Appeal' on the topic 'Prevent the spread of corona virus' with the help of the following points (100/150 words):

• Wear mask
• Hands sanitization
• Social distancing
• Healthy food

**SECTION-IV**
**(LITERARY GENRE - NOVEL)**

**Q.5. (A)** **Complete the activities given below as per the instructions:** (4) **[16]**

**(i)** **Match the columns:** (2)

|   | Column 'A' |   | Column 'B' |
|---|---|---|---|
| (a) | The Heart of Darkness | (i) | John Steinbeck |
| (b) | The Turn of the Screw | (ii) | Thomas Mann |
| (c) | Death in Venice | (iii) | Joseph Conrad |
| (d) | Pearl | (iv) | Henry James |

**(ii)** **Choose the correct alternatives and rewrite the sentences:**                    **(2)**
(a)   The central idea in the novel is _____.                    [plot / theme / story]
(b)   The main character in the novel is referred to as _____.
[antagonist / clown / protagonist]
(c)   The struggle between the opposite forces in the story is called _____.
[setting / character / conflict]
(d)   Language and techniques used in the novel is known as _____.
[manner / style / texture]

**(B)** **Answer in about 50 words to the questions given below:**                    **(4)**
(i)   Explain how the setting of the extract "To Sir' with Love" contributes to the theme of
the novel.                    (2)
(ii)  Describe in brief the plot of the extract from "To Sir, with Love".                    (2)

**(C)** **Answer in about 50 words to the questions given below:**                    **(4)**
(i)   Describe the character-sketch of Phileas Fogg from the extract of the novel "Around
the World in Eighty Days."                    (2)
(ii)  Compare the characters Passepartout and detective Fix from the extract of the novel
"Around the World in Eighty Days."                    (2)

**(D)** (i)   Arrange the sentences in correct sequence as per their occurrence in the extract
'The Sign of Four'.                    (2) **(4)**
Jumbled sentences/incidents:
(a)   Holmes put a revolver in his pocket.
(b)   Mary received a large and lustrous pearl through the post.
(c)   Mary's father was an officer in an Indian regiment.
(d)   Mary Morstan was a well-dressed young lady.

(ii)  Discuss the importance of the following statements in the light of the extract "The Sign
of Four."                    (2)
The trio-Holmes, Dr. Watson and Mary decide to visit Lyceum Theatre.

# बोर्ड कृतिपत्रिकाः जुलै 2023

**Time : 3 Hours**                              **Max. Marks: 80**

**कृतिपत्रिकेसाठी सूचनाः**

(१) आकलन कृती व व्याकरण यांमधील आकृत्या किंवा चौकटी पेनाने अथवा पेन्सिलीने व्यवस्थित काढाव्यात.

(२) स्वच्छता, नीटनेटकेपणा व लेखननियमांनुसार लेखन यांकडे जाणीवपूर्वक लक्ष द्यावे.

---

## विभाग १ – गद्य        [२०]

**कृती १. (अ) खालील उताऱ्याच्या आधारे सूचनेनुसार कृती करा :**      (८)

(१) ऑगस्ट महिन्यात येणारा मराठी महिना व सण –

     (य) ....................

     (र) ....................      (२)

(२) लेखिका अनुराधा प्रभुदेसाई यांना कर्नल झा दहा वर्षांत दोनदा भेटले ती ठिकाणे –

     (य) ....................

     (र) ....................      (२)

> ऑगस्ट महिन्यात श्रावण असतो आणि श्रावण म्हणजे 'राखी पौर्णिमा!' सगळ्यांचा आवडता सण. त्या राखीच्या एका धाग्यानं बहीण-भावाचं नातं कायमचं घट्ट राहातं. बहिणीच्या भावावरील निरपेक्ष प्रेमाची आणि भावावरील तिच्या रक्षणाच्या जबाबदारीची ही भावनिक वीण. मग आपल्या रक्षणकर्त्याला प्रत्यक्ष भेटून राखी बांधली, आशीर्वाद दिले; तर आपली कृतज्ञता व्यक्त होईल आणि राखीचा सन्मान होईल. आमचं एकमत झालं आणि रक्षाबंधनाचा मुहूर्त साधून लोकांना घेऊन कारगिलला जायचं हे निश्चित ठरवलं. चोवीसजण आमच्याबरोबर यायला तयार झाले आणि सुरू झालं 'मिशन लडाख'.
>
> सैनिकांच्या रेजिमेंटमध्ये जायचं, सैनिकांना भेटायचं; म्हणजे जणू सिंहाच्या गुहेत प्रवेश मिळवायचा होता. बऱ्याच खटपटी करून आम्हांला निघण्यापूर्वी १४ कोअरच्या लेहमधील हेडक्वार्टरमधून प्रतिसाद आला. आम्हांला १४ कोअरच्या कर्नल झा यांनी बोलावलं होतं. आमचं मन धास्तावलं; सैन्यदलातील वरिष्ठ अधिकाऱ्यांशी त्यांच्या केबिनमध्ये जाऊन बोलायचं होतं; पण मनातील कित्येक प्रश्नांची भेंडोळी कर्नल झा यांच्या प्रसन्न व्यक्तिमत्त्वापुढे बाद झाली.
>
> "तुम्ही लष्कराचं मनोबळ खूप वाढवत आहात." अशी पाठीवर थाप मिळाली आणि निघताना दारापर्यंत सोडायला आल्यावर कर्नल झा हात हातात घेऊन म्हणाले, "विसरू नका – वन्स कनेक्टेड, ऑलवेज कनेक्टेड." त्यांचा शब्द त्यांनी पुढील वर्षी आणि थेट दहा वर्षांनीही पाळला अरुणाचलमध्ये भारत-चीन सीमेवर भेटून!

(३) स्वमत अभिव्यक्ती –      (४)

     "तुम्ही लष्कराचे मनोबळ खूप वाढवत आहात", या वाक्याची यथार्थता स्पष्ट करा.

### किंवा

     'बहीण-भावाचं अतूट नातं राखी पौर्णिमेच्या सणानिमित्त दृढ होते,' हे तुमच्या शब्दांत लिहा.

**(आ) खालील उताऱ्याच्या आधारे सूचनेनुसार कृती करा :**      (८)

     **कारणे शोधा व लिहा :**

(१) पाखरांचा चिवचिवाट सुरू झालेला नसतो.      (२)

     (य)   कारण – ☐

पहाटेची वेळ मला फार आवडते.

(र)   कारण —   ┌─────────────┐
                 │             │
                 └─────────────┘

(२)   उताऱ्यात आलेल्या दोन फुलझाडांची नावे लिहा :          (२)

(य)   ………………

(र)   ………………

---

मध्यरात्र केव्हाच उलटून गेलेली असते. उत्तररात्रीनं हलकेच आकाशात पाऊल ठेवलेलं असतं. इतकं हळुवारपणे, इतकं अलगद, इतकं मुलायम, की कुणाला चाहूलदेखील लागू नये; पण ही चाहूल मला मात्र सहज लागते. तिच्या पावलांची मंद मंद नाजूक स्पंदनं माझ्या मनात मात्र कुठं तरी उमटत राहतात. जणू त्यामुळंच मग माझा डोळा लागत नाही. पुरेशी झोप झाली आहे, असं वाटत राहातं.

मी हलकेच उठतो. चूळ भरतो. डायनिंग टेबलजवळ येतो. त्याच्याजवळची खिडकी हलकेच उघडतो. रात्रीच्या नीरव शांततेची निद्रा भंग होऊ नये म्हणून. बाहेर पाहातो तो आसमंतात काळाकुळकुळीत अंधार दाटलेला. बागेतल्या साऱ्या झाडांचा, साऱ्या वेलींचादेखील डोळा लागलेला. त्यांच्यावरची पाखरंदेखील गाढ झोपलेली. त्यांचा चिवचिवाट अजून सुरू झालेला नसतो; कारण आता फक्त पहाटेचे तीन-साडेतीन तर वाजलेले असतात. का कुणास ठाऊक, ही वेळ मला फार आवडते. सारं जग साखरझोपेत असतं. साऱ्या चिंता-काळज्या मिटल्या-विरलेल्या असतात. मन कसं समेवर आलेलं असतं. मला वाटतं, आपलं खरंखुरं मन हेच असतं, जे सुखदुःखांच्या पलीकडे कुठंतरी दूर दूर गेलेलं असतं. आपलंच नव्हे तर या दुधाळ सायलीचंदेखील. तांबडसर बोगनवेलीचं देखील. केशरी गुलमोहराचंदेखील जांभुळसर जॅक्रांडाचंदेखील. किरमिजी-निळसर-पिवळसर इवल्याल्या इंद्रधनुष्टी फुलांच्या घाणेरीचंदेखील. पांढऱ्याशुभ्र नि रक्तचंदनी चाफ्याचंदेखील.

---

(३)   स्वमत अभिव्यक्ती —          (४)

'पहाटेचे आणि पाखरांचे असलेले जवळकीचे नाते,' तुमच्या शब्दांत वर्णन करा.

**किंवा**

निसर्ग आणि मानव यांच्यातील परस्परसंबंध तुमच्या शब्दांत लिहा.

**(इ)   खालील उताऱ्याच्या आधारे सूचनेनुसार कृती करा :**          (४)

(१)   कोकणातील बाबल्याच्या नंदनवनाबाबत असलेल्या कल्पना —          (२)

(य)   ………………

(र)   ………………

---

कोकणी खेड्यात झाडामाडांच्या सावलीत राहणाऱ्या तरुणाला विचारून पहा, की बाबल्या, तुझं नंदनवन रे कोणतं? तो सांगेल, 'मुंबईतल्या कारखान्यात नोकरी नि डोकं टेकायला चाळीत हक्काची कोठरी, हेच माझं नंदनवन,' मग भले पाण्याच्या नावाने ठणठणाट असो वा इतर सुविधांच्या नावाने आनंद; पण मुंबईत स्वतःची खोली पाहिजे. तोच त्या कोकण्याचा स्वर्ग. तेच मुंबईतल्या चाळीत खितपत पडलेल्या कामगाराला विचारून पहा. तो तत्काळ सांगेल, 'जो काही मोक्ष आहे तो गावाकडे वस्ती करण्यात आहे!' वास्तविक कोकणी पट्ट्यात खायचे वांधे असतात. घरात भाऊबंदकी असते. पैशांच्या नावाने शुद्ध खडखडाट असतो. गावात मुलाबाळांना शिक्षणाच्या सुविधा नसतात नि गुरांपैकी निम्मी भाकड असतात. सावकारांचे तगादे कायम असतात ते वेगळंच. तरीसुद्धा मुंबईकर कामगारांचं अवघं लक्ष त्यांच्या कोकणातल्या खेड्यात असतं. इकडे शहरवस्तीत सांजवलं, की त्याला गावाकडच्या शांत दिवेलागणीची आठवण येते. गावातल्या मारुतीच्या देवळातला घंटानाद त्याला ऐकू येतो. तिकडे चुलीवर शिजत असलेल्या पिठल्याचा वास त्याला इकडे चिचपोकळीत छळू लागतो.

---

(२)   मुंबईकर कामगाराला सायंकाळी गावाकडल्या येणाऱ्या आठवणी लिहा.          (२)

| विभाग २ – पद्य | [१६] |

**कृती २. (अ) खालील कवितेच्या आधारे सूचनेनुसार कृती करा :** (८)

    (१)   भारुडातील विंचू हे या विकारांचे प्रतीक आहे – (२)

        (य)  ......................

        (र)  ......................

    (२)   विंचू-इंगळी उतरवण्याचे उपाय – (२)

        (य)  ......................

        (र)  ......................

> विंचू चावला वृश्चिक चावला।
> कामक्रोध विंचू चावला।
> तम घाम अंगासी आला।।धृ.।।
> पंचप्राण व्याकुळ झाला।
> त्याने माझा प्राण चालिला।
> सर्वांगाचा दाह झाला ।।१।।
> मनुष्य इंगळी अति दारुण।
> मज नांगा मारिला तिनें।
> सर्वांगी वेदना जाण।
> त्या इंगळीची।।२।।
> ह्या विंचवाला उतारा।
> तमोगुण मागें सारा।
> सत्त्वगुण लावा अंगारा।
> विंचू इंगळी उतरे झरझरां ।।३।।
> सत्त्व उतारा देऊन।
> अवघा सारिला तमोगुण।
> किंचित् राहिली फुणफुण।
> शांत केली जनार्दनें ।।४।।

    (३)   अभिव्यक्ती –

        'दुर्जनांची संगत इंगळीच्या दंशाइतकी दाहक आहे, त्यावर सत्संग हा सर्व दाह शांत करणारा उपाय आहे'

        हे या भारूडाच्या आधारे स्पष्ट करा. (४)

  **(आ) खालील ओळींचा अर्थ लिहा :** (४)

    कणस भरूं दे जिवस दुधानें

    देठ फुलांचा अरळ मधानें

    कंठ खगांचा मधु गानानें

    आणीत शहारा तृणपर्णा

(इ) खालीलपैकी कोणतीही एक कृती सोडवा :                                                          (४)

**काव्यसौंदर्य :**

'रडू नकोस खुळे, उठ'! आणि डोळ्यातले हे आसू

सोडून दे शेजारच्या तळ्यात

नि घेऊन ये हातात

नुकतीच उमललेली शुभ्र कमळाची प्रसन्न फुले'

वरील ओळींतील भावसौंदर्य स्पष्ट करा.

**किंवा**

**रसग्रहण:**

कोणत्या काळी कळेना मी जगाया लागलों

अन् कुठे आयुष्य गेले कापूनी माझा गळा !

सांगती 'तात्पर्य' माझें सारख्या खोट्या दिशा:

"चालणारा पांगळा अन् पाहणारा आंधळा !"

वरील काव्यपंक्तींचे रसग्रहण करा.

---

### विभाग ३ – साहित्यप्रकार : कथा                    [१०]

**कृती ३. खालील उताऱ्याच्या आधारे सूचनेनुसार कृती करा :**                                        (४)

(अ) (१)  **एका** वाक्यात उत्तरे लिहा :                                                          (२)

कथाकथन या लोकप्रिय माध्यमांतून सादर केले जाते –

(य)  ...........................

(र)  ...........................

> कथेचे 'सादरीकरण' ही एक कला आहे आणि योग्य प्रयत्नाने ही कला साध्य होऊ शकते. विविध प्रकारच्या कथांचे मूकवाचन, प्रकट वाचन करण्याचा सराव, विविध कथा लेखकांची / लेखिकांची लेखनशैली समजून घ्यायचा केलेला प्रयत्न, भाषेची जाण, शब्दोच्चार आणि सादरीकरण कौशल्ये यांमुळे कथाकथनाचे तंत्र अवगत होऊ शकते.
>
> अलीकडच्या काळात 'कथाकथन' क्षेत्रात अनेक व्यावसायिक संधी उपलब्ध होत आहेत. कथा-अभिवाचनाचे कार्यक्रम विविध निमित्ताने रंगमंचावरून सादर केले जात आहेत. आकाशवाणी, दूरदर्शन या लोकप्रिय माध्यमांतून सादर केले जाणारे 'कथाकथन' अधिकाधिक लोकांना आकर्षित करत आहे. या पार्श्वभूमीवर कथा-सादरीकरण हा पैलू लक्षणीय ठरतो.
>
> अभिवाचनामुळे कथा श्रोत्यांपर्यंत योग्यप्रकारे पोहोचण्यास मदत होते. कथेचे अभिवाचन एकाच वेळी जर अनेकांकडून केले गेले, तर आवाजाचा एकसुरीपणा टळतो. संवादातील चढउतार, चटपटीतपणा, शब्दफेक यांतील विविधतेचा आनंद श्रोत्यांना मिळतो. कथेतील घटना, प्रसंग, व्यक्तिरेखा यांचे आकलन होण्यास मदत होते. कथावाचनाला जर पार्श्वसंगीताची, प्रकाशयोजनेची, नेपथ्याची जोड दिली तर ते अभिवाचन श्रोत्यांवर चांगला परिणाम करते व दीर्घकाळ स्मरणात राहते.

(२)  कथेच्या अभिवाचनाचा श्रोत्यांवर चांगला परिणाम होण्यासाठी पूरक असलेल्या गोष्टी लिहा.            (२)

**(आ) खालीलपैकी कोणत्याही दोन कृती सोडवा.**                                                     (६)

(य)  'शोध' या कथेतील अनुचे स्वभावचित्र तुमच्या शब्दांत रेखाटा.

(र)  'बापू गुरुजींचे गावासाठीचे योगदान' याबद्दल तुमचे मत लिहा.

(ल)  भिडे दाम्पत्याची सामाजिक बांधिलकी स्पष्ट करा.

(व)  उचापतीखोर लोकांनी बापू गुरुजींना दिलेला त्रास तुमच्या शब्दांत विशद करा.

| विभाग ४ – उपयोजित मराठी |
|---|

<div align="right">[१४]</div>

**कृती ४.(अ) खालीलपैकी कोणत्याही दोन कृती सोडवा :**  <div align="right">(४)</div>

(१)  मुलाखतीचे स्वरूप स्पष्ट करा.

(२)  माहितीपत्रकाचे वेगळेपण विशद करा.

(३)  अहवालाची प्रमुख अंगे लिहा.

(४)  व्यक्तिचित्रणात्मक वृत्तलेखाची वैशिष्ट्ये लिहा.

**(आ) खालीलपैकी कोणत्याही दोन कृती सोडवा :**  <div align="right">(१०)</div>

(१)  खालील मुद्द्यांच्या आधारे नोकरीसाठी व प्रवेशासाठी आलेल्या उमेदवाराला 'आतून' जाणून घेणे गरजेचे असते हे स्पष्ट करा :

बौद्धिक क्षमता - ज्ञानाची पातळी ....... जीवनविषयक दृष्टिकोन .......निर्णय क्षमता........ भाषेवरील प्रभुत्व ........ गटनेतृत्त्व - यशाचे श्रेय.

(२)  खालील मुद्द्यांच्या आधारे 'माहितीपत्रकाची गरज' स्पष्ट करा :

माहितीपत्रक म्हणजे ......... विविध क्षेत्रांची नावे व त्यातील गरज ......... लोकमत आकर्षित.......... वेगळेपण व वैशिष्ट्ये .......... ग्राहकाचा फायदा.

(३)  खालील मुद्द्यांच्या आधारे 'अहवाल लेखनाची आवश्यकता' स्पष्ट करा :

महत्त्वाचा दस्तऐवज .......... अधिकृतता .......... वस्तुनिष्ठ लेखन .......... भविष्यातील योजनांसाठी मदत.......... घडामोडींचा एकत्र आढावा.

(४)  खालील मुद्द्यांच्या आधारे 'वृत्तलेखांचे प्रकार' स्पष्ट करा :

बातमीवर आधारित ........ व्यक्तिचित्रणात्मक ....... मुलाखतीवर आधारित .......... ऐतिहासिक स्थळांविषयी ........ विस्मयावर आधारित.

| विभाग ५ – व्याकरण व लेखन |
|---|

<div align="right">[२०]</div>

**व्याकरण घटक व वाक्प्रचार.**

**कृती ५. (अ) सूचनेनुसार कृती करा :**  <div align="right">(१०)</div>

(१)  (य)  योग्य पर्याय निवडा :

किती आतून हसतात ती !  <div align="right">(१)</div>

वरील विधानाचे योग्य विधानार्थी वाक्य ओळखून लिहा :

(१)  ती आतून हसतात.

(२)  ती फार हसतात आतून.

(३)  ती आतून हसत राहतात.

(४)  ती खूप आतून हसतात.

(र)  सूचनेप्रमाणे सोडवा :  <div align="right">(१)</div>

पुढचे सगळे मार्ग बंदच होते.

(नकारार्थी वाक्य करा.)

(२)  (य)  योग्य पर्याय निवडा :  <div align="right">(१)</div>

'पावलोपावली' या सामासिक शब्दातील समास ओळखून लिहा.

(१)  अव्ययीभाव समास

(२)  बहुव्रीही समास

(३)  द्वंद्व समास

(४)  तत्पुरुष समास

(र)   'चोरभय' या सामासिक शब्दांतील समासाचे नाव लिहा.                                    (१)

(३)   (य)   योग्य पर्याय निवडा :                                                                          (१)

श्रीधर पंतांनी बैलांना बांधले.

या वाक्यातील प्रयोग ओळखा :

(१)   कर्तरी प्रयोग

(२)   कर्मणी प्रयोग

(३)   भावे प्रयोग

(४)   यांपैकी नाही.

(र)   योग्य पर्याय निवडा :                                                                          (१)

कर्मणी प्रयोगाचे वाक्य ओळखून लिहा.

(१)   केशवने सदरा खरेदी केला.

(२)   स्वाती चित्र रंगवते.

(३)   त्यांनी शेळ्यांना बांधले.

(४)   यांपैकी नाही.

(४)   (य)   योग्य पर्याय निवडा :                                                                          (१)

दमडिचं तेल आणलं, सासूबाईचं न्हाणं झालं

मामंजींची दाढी झाली, भावोजीची शेंडी झाली

उरलं तेल झाकून ठेवलं, लांडोरीचा पाय लागला

वेशीपर्यंत ओघळ गेला, त्यात उंट पोहून गेला.

वरील काव्यपंक्तींतील अलंकार ओळखून लिहा.

(१)   अनन्वय

(२)   अर्थांतरन्यास

(३)   अपन्हुती

(४)   अतिशयोक्ती

(र)   उपमान ओळखा :                                                                          (१)

कर्णासारखा दानशूर कर्णच,

वरील वाक्यातील उपमान ओळखा.

(५)   (य)   'आभाळाकडे डोळे लावणे' या वाक्प्रचाराचा अर्थ खालील पर्यायांतून ओळखून लिहा :      (१)

(१)   ढगाकडे पाहणे.

(२)   पावसाची वाट पाहणे.

(३)   आकाश न्याहाळणे.

(४)   आभाळ पाहणे.

(र)   'आभाळाकडे डोळे लावणे' या वाक्प्रचाराचा वाक्यात उपयोग करा.                              (१)

**(आ) खालीलपैकी कोणत्याही <u>एका</u> विषयावर सुमारे २०० ते २५० शब्दांत निबंध लिहा :**      **(१०)**

(१)   मी अनुभवलेला निसर्ग

(२)   माझा आवडता खेळ

(३)   घंटागाडीवरील कर्मचाऱ्याचे मनोगत

(४)   मी शिक्षक झालो तर .....

(५)   युग तंत्रज्ञानाचे

# BOARD QUESTION PAPER: JULY 2023
## PHYSICS

**Time: 3 Hrs.**                                                    **Max. Marks: 70**

*General Instructions:*

*The question paper is divided into **four** sections:*

*(1)* ***Section A:*** *Q. No. **1** contains **Ten multiple choice type** of questions carrying **One mark** each.*

*Q. No. **2** contains **Eight very short answer type** of questions carrying **One mark** each.*

*(2)* ***Section B:*** *Q. No. **3** to Q. No. **14** contain **Twelve short answer** type of questions carrying **Two marks** each. (Attempt **any Eight**).*

*(3)* ***Section C:*** *Q. No. **15** to Q. No. **26** contain **Twelve short answer** type of questions carrying **Three marks** each. (Attempt **any Eight**).*

*(4)* ***Section D:*** *Q. No. **27** to Q. No. **31** contain **Five long answer** type of questions carrying **Four marks** each. (Attempt **any Three**).*

*(5)* *Use of the log table is allowed. Use of calculator is **not** allowed.*

*(6)* *Figures to the right indicate full marks.*

*(7)* *For each multiple choice type of question, it is mandatory to write the correct answer along with its alphabet. e.g., (a)……./(b)……./(c)……./(d)……. No mark(s) shall be given, if ONLY the correct answer or the alphabet of the correct answer is written. Only the first attempt will be considered for evaluation.*

*(8)* *Physical Constants:*

(i)   $c = 3 \times 10^8$ m/s

(ii)  $h = 6.63 \times 10^{-34}$ Js

(iii) $\pi = 3.142$

(iv)  $g = 9.8$ m/s$^2$

(v)   $\epsilon_0 = 8.85 \times 10^{-12}$ C$^2$/Nm$^2$

(vi)  $\mu_0 = 4\pi \times 10^{-7}$ Wb/A –m

(vii) $R_H = 1.097 \times 10^7$ m$^{-1}$

(viii) Real gas constant $R = 8.31$ J mol$^{-1}$ K$^{-1}$

---

## SECTION – A

**Q.1. Select and write the correct answer for the following multiple choice type of questions:** **[10]**

(i)   A body performing uniform circular motion has constant _____.
   (a)   velocity                              (b)   kinetic energy
   (c)   displacement                          (d)   acceleration

(ii)  When soluble substance such as common salt (i.e. sodium chloride) is dissolved in water, surface tension of water _____.
   (a)   decreases                             (b)   becomes zero
   (c)   remains the same                      (d)   increases

(iii) Periodic time of angular oscillations of a bar magnet is proportional to the _____.
   (a)   ratio of moment of inertia and magnetic field
   (b)   ratio of magnetic field and moment of inertia
   (c)   square root of the ratio of moment of inertia and magnetic field
   (d)   square root of the ratio of magnetic field and moment of inertia

(iv)  The coefficient of absorption of a body is equal to its coefficient of emission at a given temperature is called _____.
   (a)   Stefan's law                          (b)   Newton's law of cooling
   (c)   Kirchhoff's law of heat radiation     (d)   Boyle's law

(v) The second law of thermodynamics deals with the transfer of _____.
    (a) work done            (b) energy
    (c) pressure             (d) heat

(vi) Which of the following phenomenon proves that light is a transverse wave _____.
    (a) Reflection          (b) Interference
    (c) Diffraction         (d) Polarization

(vii) Magnitude of induced e.m.f. produced between the ends of a conductor of length $\frac{'L'}{2}$ moving with a uniform velocity 'v' at right angles to a uniform magnetic field of intensity '2B' will be _____.
    (a) $\dfrac{BLv}{4}$             (b) $\dfrac{BLv}{2}$
    (c) $BLv$               (d) $2BLv$

(viii) Solar cell operates on the principle of _____.
    (a) diffusion            (b) recombination
    (c) photovoltaic action      (d) photoelectric effect

(ix) A body performing linear S. H. M. experiences a force of 0.2 N when displaced through 4 cm from the mean position. Its force constant will be _____.
    (a) 2 N/m           (b) 2.5 N/m
    (c) 5 N/m           (d) 8 N/m

(x) If a current of 1A flows through a solenoid of length 25 cm and made up of 250 turns of copper wire then the magnitude of magnetic induction inside the solenoid will be _____.
    (a) $0.12568 \times 10^{-3}$ T      (b) $1.2568 \times 10^{-3}$ T
    (c) $1.2568 \times 10^{2}$ T       (d) $1.2568 \times 10^{4}$ T

**Q.2. Answer the following questions:**            **[8]**

(i) State the formula for end correction in a resonance tube experiment.

(ii) Categorize the following into polar and non-polar dielectrics:
    (a) $H_2O$                  (b) $CO_2$

(iii) Define potential gradient.

(iv) Calculate the period of a particle performing linear S.H.M. with maximum speed of 0.08 m/s and maximum acceleration of 0.32 m/s$^2$.

(v) Define gyromagnetic ratio.

(vi) State the conditions for current and impedance in parallel resonance circuit.

(vii) Radius of the third Bohr orbit is 0.477 nm. Calculate the radius of the second Bohr orbit.

(viii) Name the logic gate having single input- single output.

**SECTION-B**

**Attempt any EIGHT questions of the following:**          **[16]**

**Q.3.** State the conditions for a steady interference pattern.

**Q.4.** Derive an expression for electric field intensity due to an infinitely long straight charged wire.

**Q.5.** What are eddy currents? Write two applications of eddy currents.

**Q.6.** Define and state formulae for:
    (a) Inductive reactance           (b) Capacitive reactance

**Q.7.** Draw a p –V diagram and explain the concept of positive work done and negative work done.

**Q.8.** State the law of length and the law of linear density for a vibrating string.

**Q.9.** For a moving coil galvanometer, show that $S = \dfrac{G}{n-1}$,

where S is shunt resistance.
G is galvanometer resistance
n is ratio of total current to the full scale deflection current.

**Q.10.** The de - Broglie wavelengths associated with an electron and a proton are same. Calculate the ratio of their kinetic energies.
[Given: $m_p = 1836\ m_e$]

**Q.11.** Derive an expression for 'Half Life Time' of a radioactive material using the 'Law of Radioactive Decay'.

**Q.12.** A motorcyclist performs stunt along the cylindrical wall of a 'Well of Death' of inner radius 4 m. Coefficient of static friction between the tyres and the wall is 0.4. Calculate the maximum period of revolution.
[Use $g = 10$ m/s$^2$]

**Q.13.** Calculate the diameter of a water drop, if the excess pressure inside the drop is 80 N/m$^2$:
[Surface Tension of water = $7.2 \times 10^{-2}$ N/m]

**Q.14.** Calculate the current through a long straight wire at a distance of 2.4 cm, where the magnetic field intensity is 16 $\mu$ T.

### SECTION-C

**Attempt any EIGHT questions of the following:**         **[24]**

**Q.15.** Explain construction and working of Ferry's Black Body.

**Q.16.** Show that the deflection produced in a moving coil galvanometer is directly proportional to the current flowing through its coil or vice-versa.

**Q.17.** With the help of a neat circuit diagram, explain the working of a half wave rectifier. Draw input-output waveforms.

**Q.18.** Obtain the expression for the period of simple pendulum performing S.H.M.

**Q.19.** Show that the beat frequency of two interfering sound waves is the difference between the individual frequencies of the two sound waves.

**Q.20.** Obtain an expression for orbital magnetic moment of an electron revolving around the nucleus of an atom.

**Q.21.** State Einstein's photoelectric equation. Hence, explain any two characteristics of photoelectric effect.

**Q.22.** Calculate the shortest wavelength of Paschen series and longest wavelength of Balmer series for H – atom.

**Q.23.** A 60 W filament lamp loses all its energy by radiation from its surface. The emissivity of the filament surface is 0.5 and the surface area is $5 \times 10^{-5}$ m$^2$. Calculate the temperature of the filament.
[Given : $\sigma = 5.67 \times 10^{-8}$ Jm$^{-2}$ s$^{-1}$ K$^{-4}$]

**Q.24.** Two capacitors of capacities $C_1$ and $C_2$ are connected in parallel and this combination is connected in series with a capacitor of capacity $C_3$. Calculate the equivalent capacity of the combination of capacitors.

**Q.25.** With an unknown resistance X in the left gap and a resistance of 30 $\Omega$ in the right gap of a meter-bridge, the null point is obtained at 40 cm from the left end of the wire. Calculate the unknown resistance and shift in the position of the null point, when resistance in each gap is increased by 15$\Omega$.

**Q.26.** An inductor of inductance 200 mH is connected to an A.C. source of peak e.m.f. 210 V and frequency 50 Hz. Calculate the peak current and instantaneous voltage of the source when the current is at its peak value.

**SECTION - D**

**Attempt any THREE questions of the following:**      **[12]**

**Q.27.** State and prove theorem of parallel axes.

**Q.28.** Define:
 (i)  Isothermal process    (ii)  Adiabatic process
 One mole of an ideal gas is enclosed in an ideal cylinder at 1.0 mPa and 27°C. The gas is allowed to expand till its volume is doubled. Calculate the work done if the expansion is isobaric.

**Q.29.** Distinguish between streamline flow and turbulent flow. (Any Two points).
 Calculate the terminal velocity with which an air bubble of diameter 0.4 mm rise through a liquid of viscosity 0.1 Ns/m$^2$ and density 900 kg/m$^3$. Density of air is 1.29 kg/m$^3$.

**Q.30.** What are Fraunhofer diffraction and Fresnel diffraction?

 A plane wavefront of light of wavelength 5500Å is incident onto a slit perpendicular to the direction of light rays. If the total separation of 10 bright fringes on a screen 2 m away is 2 cm, calculate the distance between the slits.

**Q.31.** What is a transformer? State the working principle of transformer. Hence, distinguish between Step up and Step down transformer. (Any Two points).

# BOARD QUESTION PAPER : JULY 2023
## CHEMISTRY

**Time: 3 Hrs.**                                                                                      **Max. Marks: 70**

***General Instructions:***

*The question paper is divided into **four** sections.*

*(1)*    ***Section A:*** *Q. No. **1** contains **Ten** multiple choice type of questions carrying **One** mark each.*
          *Q. No. **2** contains **Eight** very short answer type of questions carrying **One** mark each.*

*(2)*    ***Section B:*** *Q. No. **3** to Q. No. **14** are **Twelve** short answer type of questions carrying **Two** marks each. (Attempt **any Eight**).*

*(3)*    ***Section C:*** *Q. No. **15** to Q. No. **26** are **Twelve** short answer type of questions carrying **Three** marks each. (Attempt **any Eight**).*

*(4)*    ***Section D:*** *Q. No. **27** to Q. No. **31** are **Five** long answer type of questions carrying **Four** marks each. (Attempt **any Three**).*

*(5)*    *Use of log table is allowed. Use of calculator is not allowed.*

*(6)*    *Figures to the right indicate full marks.*

*(7)*    *For each multiple choice type of question, it is mandatory to write the correct answer along with its alphabet e.g. (a)……./(b)……./(c)……./(d)……etc.*
          *No mark(s) shall be given, if <u>ONLY</u> the correct answer or the alphabet of the correct answer is written.*
          *Only the first attempt will be considered for evaluation.*
          *Given:*

*(8)*    *Physical constant:*
          *Avogadro Number = $N_A = 6.022 \times 10^{23}$*

---

## SECTION – A

**Q.1.** **Select and write the correct answer for the following multiple choice type of questions:**                **[10]**

(i)    Anisole on heating with concentrated HI gives _____.
    (a)    Iodobenzene                                          (b)    Phenol + Methanol
    (c)    Iodobenzene + Methanol                      (d)    Phenol + Iodomethane

(ii)    Which solution shows positive deviation from Raoult's law?
    (a)    Phenol and Aniline                              (b)    Chloroform and Acetone
    (c)    Ethanol and Acetone                            (d)    Chloroform and Ethanol

(iii)    The coordination number of cobalt in $[CoCl_2(en)_2]^+$ is
    (a)    6                                                        (b)    4
    (c)    2                                                        (d)    0

(iv)    
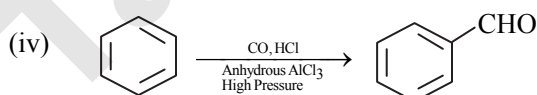
    The name of above reaction is _____.
    (a)    Etard reaction                                    (b)    Friedel Craft acylation reaction
    (c)    Stephen reaction                                (d)    Gatterman-Koch reaction

(v)    Which is an example of thermoplastic polymer?
    (a)    Bakelite                                            (b)    Polystyrene
    (c)    Nylon 6, 6                                          (d)    Urea formaldehyde resin

(vi)    Nichrome is an alloy of _____.
    (a)    Cu, Sn                                              (b)    Cu, Ni
    (c)    Ni, Cr                                              (d)    Fe, Cr

(vii) Identify 'A' in the following reaction:

$$A + 2Na \xrightarrow{\text{dry ether}} \text{[biphenyl structure]} + 2NaCl$$

  (a)   Bromobenzene               (b)   1, 4-dichlorobenzene
  (c)   Naphthalene                  (d)   Chlorobenzene

(viii) Which amine does NOT react with Hinsberg reagent?
  (a)   Ethanamine                   (b)   N-ethylethanamine
  (c)   N, N-diethylethanamine       (d)   2-methyl-propan-2-amine

(ix) The dissociation constant of $NH_4OH$ is $1.8 \times 10^{-5}$. The degree of dissociation in its 0.01 M solution is _____.
  (a)   0.04242                     (b)   0.4242
  (c)   0.004242                  (d)   4.242

(x) Half-life of a first order reaction is 30 minutes at 300 K. The value of its rate constant, K is _____.
  (a)   $2.31 \text{ min}^{-1}$             (b)   $0.0231 \text{ min}^{-1}$
  (c)   $0.231 \text{ min}^{-1}$           (d)   $2.310 \times 10^{-3} \text{ min}^{-1}$

**Q.2.** **Answer the following questions:**                             **[8]**

  (i)     Write the name of radioactive element in group 16.

  (ii)    Write the structure of glycine.

  (iii)   Write the unit of cell constant.

  (iv)   Write the number of particles present in FCC per unit cell.

  (v)    Name the γ-isomer of BHC.

  (vi)   Write the IUPAC name of isobutyraldehyde.

  (vii)   Which alloy is used in Fischer Tropsch process in the synthesis of gasoline?

  (viii) Three moles of an ideal gas are expanded isothermally from 15 dm³ to 20 dm³ at constant external pressure of 1.2 bar. Estimate the amount of work in Joules.

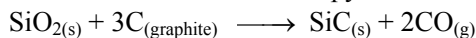### SECTION-B

**Attempt any EIGHT of the following questions:**                       **[16]**

**Q.3.** Write four postulates of Werner theory of coordination complexes.

**Q.4.** Why fluorine shows anomalous behaviour?

**Q.5.** What is the mass of Cu metal produced at the cathode during the passage of 5 ampere current through $CuSO_4$ solution for 6000 seconds. Molar mass of Cu is 63.5 g mol⁻¹.

**Q.6.** How is glucose prepared from sucrose?

**Q.7.** Derive integrated rate law for zero order reaction.

**Q.8.** The normal boiling point of ethyl acetate is 77.06 °C. A solution of 50 g of a non-volatile solute in 150 g of ethyl acetate boils at 84.27 °C. Evaluate the molar mass of solute if $K_b$ for ethyl acetate is 2.77 °C kg mol⁻¹.

**Q.9.** How is phenol prepared from cumene?

**Q.10.** Why do d-block elements form coloured compounds?

**Q.11.** Write a note on: Wolf-Kishner reduction reaction.

**Q.12.** How is Nylon 6, 6 prepared?

**Q.13.** Derive Ostwald's dilution law equation for weak acid.

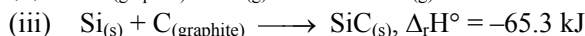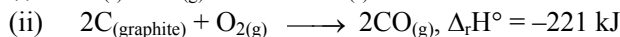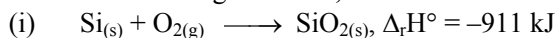**Q.14.** What is Grignard reagent? How it is prepared?

## SECTION-C

**Attempt any EIGHT of the following questions:**      **[24]**

**Q.15.** Calculate the standard enthalpy of the reaction:

$SiO_{2(s)} + 3C_{(graphite)} \longrightarrow SiC_{(s)} + 2CO_{(g)}$

From the following reactions,

(i)      $Si_{(s)} + O_{2(g)} \longrightarrow SiO_{2(s)}$, $\Delta_r H° = -911$ kJ

(ii)      $2C_{(graphite)} + O_{2(g)} \longrightarrow 2CO_{(g)}$, $\Delta_r H° = -221$ kJ

(iii)      $Si_{(s)} + C_{(graphite)} \longrightarrow SiC_{(s)}$, $\Delta_r H° = -65.3$ kJ

**Q.16.** Write a note on Hofmann bromamide degradation.

Convert benzene diazonium chloride into benzene.

**Q.17.** Write any three advantages and disadvantages of nanoparticles and nanotechnology.

**Q.18.** Write molecular formula and structure of:

(i)      Sulphuric acid               (ii)      Peroxy monosulphuric acid

(iii)      Thiosulphuric acid

**Q.19.** Explain optical activity of 2-chlorobutane.

**Q.20.** Write different oxidation states of manganese. Why +2 oxidation state of manganese is more stable?

**Q.21.** Prepare the following by using methyl magnesium iodide:

(i)      Ethanol          (ii)      Propan-2-ol      (iii)      2-methylpropan-2-ol

**Q.22.** Define: Ebullioscopic constant.

Derive the relation between freezing point depression and molar mass of solute.

**Q.23.** Define: Buffer solution.

Write any four applications of buffer solution.

**Q.24.** An element with molar mass 27 g/mol forms cubic unit cell with edge length of 405 pm. If density of the element is 2.7 g/cm$^3$ what is the nature of cubic unit cell?

**Q.25.** On the basis of valence bond theory explain the nature of bonding in $[Ni(Cl)_4]^{2-}$ complex ion.

**Q.26.** Convert:

(i)      Acetic acid to acetamide            (ii)      Acetyl chloride to acetic anhydride

(iii)      Sodium acetate to methane

## SECTION - D

**Attempt any THREE of the following questions:**      **[12]**

**Q.27.** Define isomorphism.

Write Arrhenius equation. Derive an expression to determine activation energy for two different temperatures $T_1$ and $T_2$.

**Q.28.** What are interhalogen compounds?

Write any two general characteristics of interhalogen compounds.

Draw the Fischer projection formula for $\alpha -D- (+)$ glucose.

Write reaction involved in the formation of Teflon.

**Q.29.** Describe the construction and working of Standard Hydrogen Electrode.

Write any two difficulties in setting SHE.

**Q.30.** Write any two statements of first law of thermodynamics.

For a certain reaction $\Delta H°$ is $-224$ kJ and $\Delta S°$ is $-153$ Jk$^{-1}$. At what temperature the change over from spontaneous to nonspontaneous will occur?

**Q.31.** Define:

(i)      Gangue             (ii)      Ionization isomer

(iii)      Aromatic ketones

Write the use and environmental effect of methylene chloride.

# BOARD QUESTION PAPER : JULY 2023
## MATHEMATICS AND STATISTICS

**Time: 3 Hrs.**                                                              **Max. Marks: 80**

*General instructions:*

*The question paper is divided into **FOUR** sections.*

*(1)*   **Section A:** *Q. 1 contains **Eight** multiple choice type of questions, each carrying **Two** marks.*
       *Q. 2 contains **Four** very short answer type questions, each carrying **one** mark.*

*(2)*   **Section B:** *Q. 3 to Q. 14 contain **Twelve** short answer type questions, each carrying **Two** marks. (Attempt any **Eight**)*

*(3)*   **Section C:** *Q. 15 to Q. 26 contain **Twelve** short answer type questions, each carrying **Three** marks. (Attempt any **Eight**)*

*(4)*   **Section D:** *Q. 27 to Q. 34 contain **Eight** long answer type questions, each carrying **Four** marks. (Attempt any **Five**)*

*(5)*   *Use of log table is allowed. Use of calculator is not allowed.*

*(6)*   *Figures to the right indicate full marks.*

*(7)*   *Use of graph paper is <u>not</u> necessary. Only rough sketch of graph is expected.*

*(8)*   *For each multiple choice type of question, it is mandatory to write the correct answer along with its alphabet, e.g., (a)……. / (b)…….. /(c)…….. /(d)…….., etc. No marks shall be given, if <u>ONLY</u> the correct answer or the alphabet of correct answer is written. Only the first attempt will be considered for evaluation.*

*(9)*   *Start answer to each section on a new page.*

## SECTION – A

**Q.1.** **Select and write the correct answer for the following multiple choice type of questions:**                    **[16]**

i.      The dual of statement $p \wedge \sim q$ is equivalent to _____.

   (a)   $\sim p \wedge q$       (b)   $p \leftrightarrow q$       (c)   $\sim p \vee q$       (d)   $\sim p \rightarrow \sim q$       (2)

ii.     If $|\bar{a}| = 3$, $|\bar{b}| = 4$, then a value of $\lambda$ for which $a + \lambda \bar{b}$ is perpendicular to $\bar{a} - \lambda \bar{b}$ is _____.

   (a)   $\dfrac{9}{16}$       (b)   $\dfrac{3}{4}$       (c)   $\dfrac{3}{2}$       (d)   $\dfrac{4}{3}$       (2)

iii.    The acute angle between the lines $\dfrac{x-1}{1} = \dfrac{y-2}{-1} = \dfrac{z-3}{2}$ and $\dfrac{x-1}{2} = \dfrac{y-2}{1} = \dfrac{z-3}{1}$ is _____.

   (a)   60°       (b)   30°       (c)   45°       (d)   90°       (2)

iv.     The vector equation of the plane passing through point $A(\bar{a})$ and parallel to $\bar{b}$ and $\bar{c}$ is _____.

   (a)   $(\bar{r} - \bar{a}) \times (\bar{b} \times \bar{c}) = \bar{0}$         (b)   $(\bar{r} - \bar{a}) \cdot (\bar{b} + \bar{c}) = 0$

   (c)   $(\bar{r} - \bar{a}) \cdot (\bar{b} \times \bar{c}) = 0$         (d)   $(\bar{r} - \bar{a}) \times (\bar{b} - \bar{c}) = \bar{0}$       (2)

v.      If $x = at^4$, $y = 2at^2$, then $\dfrac{dy}{dx} =$ _____.

   (a)   $\dfrac{1}{t^2}$       (b)   $t^2$       (c)   $2t^2$       (d)   $-\dfrac{1}{t^2}$       (2)

vi.     The area bounded by the curve $y = 2x$, the Y-axis, the X-axis and $x = 3$ is _____.

   (a)   3 sq. units       (b)   6 sq. units       (c)   9 sq. units       (d)   12 sq. units       (2)

vii.    The differential equation $y\dfrac{dy}{dx} + x = 0$ represents family of _____.

    (a) circle       (b) parabola     (c) ellipse       (d) hyperbola     (2)

viii.   If $f(x) = kx^2(1 - x)$, for $0 < x < 1$
        $= 0$           , otherwise, is the probability distribution function of a random variable X, then the value of k is _____.

    (a) 12       (b) 10       (c) −9       (d) −12     (2)

**Q.2. Answer the following questions:**       **[4]**
i.     Write the domain of inverse secant function.     (1)

ii.    Find the value of k, if lines represented by $kx^2 + 4xy - 4y^2 = 0$ are perpendicular to each other.     (1)

iii.   Evaluate: $\displaystyle\int \dfrac{1}{x\sqrt{\log x}}\,dx$     (1)

iv.    Obtain the differential equation by eliminating the arbitrary constant from the equation $y^2 = 4ax$.     (1)

**SECTION – B**

**Attempt any EIGHT of the following questions:**       **[16]**
**Q.3.** Write the following compound statements symbolically:
    (i) Nagpur is in Maharashtra and Chennai is in Tamilnadu.
    (ii) If $\triangle ABC$ is right angled at B, then $m\angle A + m\angle C = 90°$     (2)

**Q.4.** Find the co-factors of the elements $a_{11}$ and $a_{21}$ of matrix A = $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.     (2)

**Q.5.** Find the solution of $\cos\theta = \dfrac{1}{2}$, where $0 \le \theta < 2\pi$.     (2)

**Q.6.** Find the joint equation of lines passing through the origin having slopes, 2 and 3.     (2)

**Q.7.** If the vectors $-3\hat{i} + 4\hat{j} - 2\hat{k}$, $\hat{i} + 2\hat{k}$ and $\hat{i} - p\hat{j}$ are coplanar, then find the value of p.     (2)

**Q.8.** Find the direction cosines of the vector $2\hat{i} + 2\hat{j} - \hat{k}$.     (2)

**Q.9.** Find the equation of tangent to the curve $y = x^2 + 2e^x + 2$ at the point $(0, 4)$.     (2)

**Q.10.** Evaluate: $\displaystyle\int \dfrac{3^x - 4^x}{5^x}\,dx$     (2)

**Q.11.** Evaluate: $\displaystyle\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \cos x\,dx$     (2)

**Q.12.** Find the area of the region bounded by the curve $y = x^2$, the X-axis and the lines $x = 1$, $x = 3$.     (2)

**Q.13.** Find the integrating factor (I. F.) of the differential equation:
    $\dfrac{dy}{dx} + y = e^{-x}$     (2)

**Q.14.** Given that $X \sim B(n, p)$.
    If $p = 0.6$ and $E(X) = 6$, find n and $Var(x)$.     (2)

**SECTION – C**

**Attempt any EIGHT of the following questions:**       **[24]**
**Q.15.** Prove that $\tan^{-1} 1 + \tan^{-1} 2 + \tan^{-1} 3 = \pi$     (3)

**Q.16.** If one of the lines given by $ax^2 + 2hxy + by^2 = 0$ bisects an angle between the co-ordinate axes then show that $(a + b)^2 = 4h^2$     (3)

**Q.17.** Let $A\left(\bar{a}\right)$ and $B\left(\bar{b}\right)$ be any two points in the space and $R\left(\bar{r}\right)$ be the third point on the line AB

dividing the segment AB externally in the ratio m : n. Then prove that $\bar{r} = \dfrac{m\bar{b} - n\bar{a}}{m - n}$      (3)

**Q.18.** Find the position vector of point P such that OP is inclined to X – axis at 45° and to Y – axis at 60° and OP = 12 units.      (3)

**Q.19.** Find the vector equation of the line passing through the point having position vector $2\hat{i} + \hat{j} - 3\hat{k}$ and perpendicular to vectors $\hat{i} + \hat{j} + \hat{k}$ and $\hat{i} + 2\hat{j} - \hat{k}$.      (3)

**Q.20.** The foot of perpendicular drawn from the origin to a plane is M(1, 2, 0). Find the vector equation of the plane.      (3)

**Q.21.** If $\log_{10}\left(\dfrac{x^3 - y^3}{x^3 + y^3}\right) = 2$, show that $\dfrac{dy}{dx} = \dfrac{-99x^2}{101y^2}$      (3)

**Q.22.** A wire of length 36 meters is bent in the form of rectangle. Find its dimensions if the area of the rectangle is maximum.      (3)

**Q.23.** Evaluate: $\int \dfrac{e^x}{1 + e^{-x}}\, dx$      (3)

**Q.24.** Solve the differential equation:

$\dfrac{dy}{dx} = (4x + y + 1)^2$      (3)

**Q.25.** The probability distribution of X is as follows:

| X | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| P(X = x) | 0.1 | K | 2K | 2K | K |

Find: (i)    K        (ii)    P(X < 2)        (iii)   P(X ≥ 3)      (3)

**Q.26.** Ten eggs are drawn successively with replacement from a lot containing 10% defective eggs. Find the probability that there is at least one defective egg.      (3)

## SECTION – D

**Attempt any FIVE of the following questions:**      **[20]**

**Q.27.** Construct the truth table for the statement pattern $(p \rightarrow q) \wedge [(q \rightarrow r) \rightarrow (p \rightarrow r)]$ and interpret your result.      (4)

**Q.28.** Solve the following equations by using method of inversion:

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

**Q.29.** Prove that, in $\triangle ABC$,

$\tan\left(\dfrac{A - B}{2}\right) = \left(\dfrac{a - b}{a + b}\right)\cot\left(\dfrac{c}{2}\right)$      (4)

**Q.30.** Solve the linear programming problem by graphical method:

Maximize: $z = 3x + 5y$

Subject to: $x + 4y \leq 24$

            $3x + y \leq 21$

            $x + y \leq 9$ and $x \geq 0,\ y \geq 0$

Also find maximum value of z.      (4)

**Q.31.** If $y = f(x)$ is a differentiable function of $x$ on an interval 1 and $y$ is one-one, onto and $\dfrac{dy}{dx} \neq 0$ on 1,

then prove that $\dfrac{dx}{dy} = \dfrac{1}{\dfrac{dy}{dx}}$ .

where $\dfrac{dy}{dx} \neq 0$. Hence prove that $\dfrac{d}{dx}(\cot^{-1}x) = \dfrac{-1}{1+x^2}$ (4)

**Q.32.** The volume of the spherical ball is increasing at the rate of $4\pi$ cc/sec. Find the rate at which the radius and the surface area are changing when the volume is $288\pi$ cc. (4)

**Q.33.** Prove that: $\displaystyle\int \dfrac{1}{x^2 - a^2}\, dx = \dfrac{1}{2a}\, \log \left|\dfrac{x-a}{x+a}\right| + c$

Hence evaluate: $\displaystyle\int \dfrac{1}{x^2 - 3}\, dx$ (4)

**Q.34.** Evaluate: $\displaystyle\int_{0}^{\frac{\pi}{2}} \cos^3 x\, dx$ (4)

# BOARD QUESTION PAPER: JULY 2023
## BIOLOGY

**Time: 3 Hrs.**          **Max. Marks: 70**

*General Instructions:*

    *The question paper is divided into **four** sections.*

    *(1)*    **Section A:** *Q. No. **1** contains **Ten multiple choice** type of questions carrying **one** mark each.*

       *(i)*    *For each multiple choice type of question, it is mandatory to write the correct answer along with its alphabet, e.g., **(A)** ……. / **(B)** ……. / **(C)** ……. / **(D)** ……. etc. No mark/s shall be given if <u>ONLY</u> the correct answer or alphabet of the correct answer is written.*

       *(ii)*    *In case of **MCQ,** evaluation will be done for the **first attempt** only.*

          *Q. No. **2** Contains **Eight very short answer** type of questions carrying **one** mark each.*

    *(2)*    **Section B:** *Q. No. **3** to **14** are **short answer** type of questions carrying **two** marks each. (Attempt **any Eight**)*

    *(3)*    **Section C:** *Q. No. **15** to **26** are **short answer** type of questions carrying **three** marks each. (Attempt **any Eight**)*

    *(4)*    **Section D:** *Q. No. **27** to **31** are **long answer** type of questions carrying **four** marks each. (Attempt **any Three**)*

    *(5)*    *Begin the answer of each section on a new page.*

## SECTION – A

**Q.1.**   **Select the correct alternatives and write the answers:**        **[10]**

i.    If members of two populations have difference in the structure of reproductive organs, then this type of isolation is called _____.
    (A)   ethological          (B)   seasonal
    (C)   mechanical         (D)   habitat

ii.    The primary precursor of Indole-3-Acetic acid is _____.
    (A)   Tryptophan         (B)   Phenyl alanine
    (C)   Mevalonic acid      (D)   Methionine

iii.    If only one DNA molecule is subjected to PCR and the time required for each cycle is three minutes, then after five cycles, how many DNA molecules are obtained?
    (A)   10               (B)   15
    (C)   32               (D)   64

iv.    The specific gravity of CSF is _____.
    (A)   1.005           (B)   1.02
    (C)   1.502           (D)   1.81

v.    Cardiac output of a person is 5400 ml and heart rate 72 per min. What will be his stroke volume?
    (A)   65 ml          (B)   74 ml
    (C)   75 ml          (D)   78 ml

vi.    Detritus food chain starts from _____.
    (A)   producers          (B)   dead organic matter
    (C)   parasite           (D)   photosynthesis

vii.    Plants absorb _____ water.
    (A)   gravitational       (B)   capillary
    (C)   combined         (D)   hygroscopic

viii.    The organisms having tolerance for wide range of salinity are called _____.
    (A)   stenothermal       (B)   euryhaline
    (C)   stenohaline        (D)   eurythermal

ix.    Hisardale is a new breed of sheep developed by crossing _____.
   (A)   Bikaneri ram and Marino ewe      (B)   Bikaneri ram and Bikaneri ewe
   (C)   Marino ram and Bikaneri ewe      (D)   Marino ewe and Marino ram

x.    Perforins are secreted by _____.
   (A)   Helper T-cells                   (B)   Cytotoxic T-cells
   (C)   Suppressor T-cells               (D)   Memory T-cells

**Q.2.**  **Answer the following questions:**                                    **[8]**
   i.    Mention the chromosome number having the mutated gene for β-Thalassemia.

   ii.   Which organ produces calcitriol?

   iii.  If the megaspore mother cell has 26 chromosomes, what will be the total number of chromosomes in endosperm of the same plant?

   iv.   Define the term – Facilitated diffusion.

   v.    Give reason – Energy pyramid is always upright.

   vi.   What will be the base sequence on the template strand of DNA, which codes for methionine?

   vii.  Deficiency of which element causes Brown heart disease in plants?

   viii. Where are the cells of Rauber situated in the blastocyst of human embryo?

### SECTION – B

**Attempt any EIGHT of the following questions:**                                **[16]**

**Q.3.**  i.    Give one example each of:
   a.    Autosomal dominant traits
   b.    Autosomal recessive traits

   ii.   If a carrier woman marries a colorblind man, what will be the phenotype of their progeny? Show in the form of a chart.

**Q.4.**  Sketch the appropriate diagrams showing following chromosomal aberrations:
   i.    deletion
   ii.   inversion

**Q.5.**  Observe the following diagram of double circulation and identify A, B, C and D:
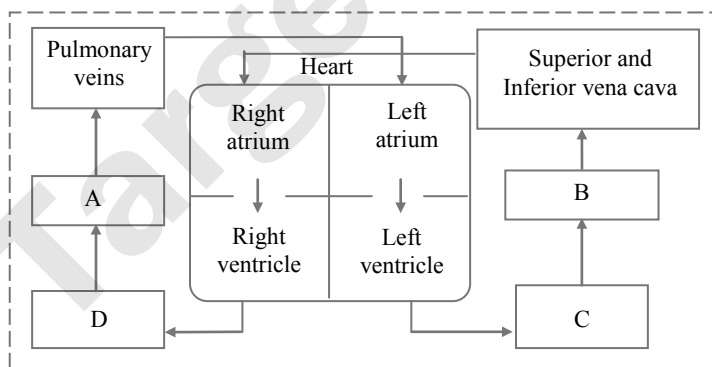


**Q.6.**  i.    Select the names of fresh-water fishes from the given list:
         *Sardinella, Rastrelliger, Cirrhina, Harpadon, Labeo*
   ii.   Write the economic importance of Lac (Any Two).

**Q.7.**  i.    Define the term – Ecological succession.
   ii.   What is the reason of eutrophication?

**Q.8.**  i.    Mention any two ill-effects of UV-rays on human beings.
   ii.   Give significance of Ecosan.

**Q.9.** What are oral vaccines?
Enlist the benefits of oral vaccines.

**Q.10.** What is vernalization?
Give the advantages of vernalization.

**Q.11.** Enlist the causes of biodiversity losses.

**Q.12.** Give role of hormones Relaxin and Inhibin.

**Q.13.** Sketch and label the diagram of a stoma showing kidney – shaped guard cells.

**Q.14.** Explain in brief the process of southern blotting and hybridization in DNA fingerprinting.

## SECTION – C

**Attempt any EIGHT of the following questions:**                                  [24]

**Q.15.** i.   Define – Palaeontology.
ii.  Give any four points of significance of palaeontology.

**Q.16.** i.   What is pollination?
ii.  Differentiate between Anaemophily and Entomophily with reference to :
a.   pollinating agent
b.   stigma
c.   nectar
d.   fragrance

**Q.17.** i.   Differentiate between hypotonic and hypertonic solutions.
ii.  Mention the effect of exo-osmosis and endo-osmosis on shape of the cell.
iii. Give one difference between symplast and apoplast pathway.

**Q.18.** i.   Mention the control measures to prevent ascariasis.
ii.  With appropriate terms, complete the following chart and rewrite it.

| Sr. No. | Name of disease | Name of pathogen |
|---------|-----------------|------------------|
| a. | ——?—— | *Entamoeba histolytica* |
| b. | Typhoid | ——?—— |
| c. | ——?—— | *Wuchereria bancrofti* |
| d. | ——?—— | *Plasmodium species* |

**Q.19.** i.   Define – Adaptation.
ii.  Explain any two adaptations in *Opuntia* and Seal.

**Q.20.** Match the disease resistant varieties given in Column-I with the crops in Column-II and rewrite:

| | Column-I | | Column-II |
|------|----------------|------|-------------|
| i. | Himgiri | a. | Chilli |
| ii. | Pusa shubhra | b. | Wheat |
| iii. | Pusa sadabahar | c. | Cauliflower |
| | | d. | Cotton |

**Q.21.** i.   Explain the qualitative and quantitative aspects of growth phenomenon.
ii.  Explain the phase of cell maturation.

**Q.22.** i.   What is co-dominance?
ii.  If a red colored female cattle is crossed with a white male cattle, what will be the appearance of progeny in F2 generation? Show the genotypes with the help of a chart.

**Q.23.** i.   Give any two involuntary vital functions of medulla oblongata.
ii.  Mention two functions of spinal cord.

**Q.24.** i.   Define –Transcription.
ii.  Write anticodons for the following triplet codons:
AUG, GAG, CUA, CCU

**Q.25.** i.     Mention the position of the following in human heart:
     a.     Eustachian valve
     b.     Bicuspid valve

    ii.     Differentiate between open and closed circulation with reference to:
     a.     blood pressure
     b.     exchange of material

**Q.26.** Draw a neat and proportionate diagram of *Graafian follicle* and label oocyte and antrum. Explain its structure in brief.

<div align="center">SECTION – D</div>

**Attempt any THREE of the following questions:**                                                    **[12]**

**Q.27.** i.     What is placenta?
    ii.     Give reason – Placenta is considered as a temporary endocrine gland.
    iii.     Give significance of hCG.

**Q.28.** Describe in brief the structural and hormonal changes during ovarian cycle.

**Q.29.** i.     Name the formed elements which are useful in blood coagulation. Give its normal number per cubic milimeter ($mm^3$) in human blood.
    ii.     Comment on the shape and secretion of the above mentioned formed elements.
    iii.     Explain in brief the mechanism of blood coagulation.

**Q.30.** i.     Give full form of the cloning vectors BAC and YAC.
    ii.     Write the appropriate palindrome for Eco RI and indicate by an arrow its recognition sequence.
    iii.     Give any four uses of gene therapy.

**Q.31.** Explain any four contrivances to prevent self pollination in plants with an appropriate example of each type.