

GENERAL INSTRUCTIONS

The Question Paper is divided into THREE sections- **READING SKILLS, GRAMMAR & CREATIVE WRITING, AND LITERATURE.**

Read the instructions given against each question and answer accordingly.

SECTION-A READING SKILLS [25 marks]

1] Read the passage given below.

1.” Rivers should link, not divide us,” said the Indian Prime Minister expressing concern over interstate disputes and urged state governments to show “understanding and consideration, statesmanship and an appreciation of the other point of view.”

2. Water conflicts in India now reach every level; divide every segment of our society, political parties, states, regions, sub-regions within states, districts, castes and groups and individual farmers. Water conflicts within and between many developing countries are also taking a serious turn. Fortunately, the “water wars”, forecast by so many, have not yet materialized. War has taken place, but over oil, not water. Water is radically altering and affecting political boundaries all over the world, between as well as within countries. In India, water conflicts are likely to worsen before they begin to be resolved. Till then they pose a significant threat to economic growth, security and health of the ecosystem and the victims are likely to be the poorest of the poor as well as the very sources of water-rivers, wetlands and aquifers.

3. Conflicts may sound bad or negative, but they are logical developments in the absence of proper democratic, legal and administrative mechanisms to handle issues at the root of water conflicts. Part of the problem stems from the specific nature of water, namely that water is divisible and amenable to sharing; one unit of water used by one is a unit denied to others; it has multiple uses and users and involves resultant trade-offs.

Excludability is an inherent problem and very often exclusion costs involved the issue of graded scales and boundaries and need for evolving a corresponding understanding around them. Finally, the way water is planned, used and managed causes externalities, both positive and negative, and many of them are unidirectional and dynamic.

4. There is a relatively greater visibility as well as a greater body of experience in evolving policies, frameworks, legal set-ups and administrative mechanisms dealings with immobile natural resources, however contested the space may be. Reformists as well as revolutionary movements are rooted in issues related to land. Several political and legal interventions addressing the issue of equity and societal justice have been attempted.

Most countries have gone through land reforms of one type or another. Issues related to forests have also generated a body of comprehensive literature on forest resources and rights. Though conflicts over them have received much more serious attention, they have been studied in their own right and practical as well as theoretical means of dealing with them have been sought. In contrast, water conflicts have not received the same kind of attention.

On the basis of your reading of the passage, answer the following questions.

[10x1=10]

i] According to the author, which of the following is/are consequences of water conflicts?

- A. Trans-border conflicts between developing countries.
 - B. Water-bodies will remain unused and affected till the conflict is resolved.
 - C. Water conflicts have altered the political boundaries within countries.
- a] Only A b] Only B c] Only C d] None of these

ii] Which of the following is true in the context of the passage?

- a] Water wars are taking place between many developing countries.
- b] There have been several legal interventions in India to govern the use of natural resources.
- c] The poor people are worst affected by water conflicts.
- d] None of the above.

iii] What is the Prime Minister’s advice to resolve water disputes?

- a] Link all rivers to make national grid.
- b] Politicians alone can solve the problem.
- c] Bridges and dams can resolve water issues.
- d] Make consensual and conscious efforts.

iv] Pick out the word which is closest in meaning to the word printed in bold as used in the passage. [‘INHERENT’]

- a] Functional. b] Intense.
- c] Persistent. d] Characteristic.

v] According to the passage, which of the following is a limitation of water resulting in disputes?

- a] Water is not a divisible resource.
- b] Manipulation of water distribution is easy.
- c] Water is an interconnected resource.
- d] None of these

vi] Which of the following is not true in the context of the passage?

- a] Deeper problems exist at the root of all water conflicts.
- b] Only social stability is affected by water disputes.
- c] Competing uses of water is a cause of water conflict.
- d] In India water conflicts affect all levels.

vii] The author's main objective in writing the passage is to?

- a] Showcase government commitment regarding the water distribution problem.
- b] Make a strong case for war as the logical resolution for water conflicts.
- c] Point out the seriousness of the threat posed by the unresolved conflicts.
- d] Describe how the very nature of water contributes to water struggles.

viii] Pick out the word which is the closest in meaning to the word printed in bold as used in the passage. ['ASYMMETRIC']

- a] Unsteady.
- b] Discouraging.
- c] Superior.
- d] Equilibrium.

ix] Which of the following can be inferred about water conflicts?

- a] Water management techniques like dams, linking rivers, etc. have negative consequences.
- b] There is no real solution to water conflicts.
- c] Despite receiving much attention water conflicts remain unresolved.
- d] All of the above.

x] Pick out the word which is the closest in meaning to the word printed in bold as used in the passage. ['MATERIALIZED']

- a] Mattered.
- b] Interfered.
- c] Hidden.
- d] Presented.

2] Read the passage given below.

The UN's 2017 International Year tells that sustainable tourism is an important tool for development, most importantly in poor communities and countries. Today sustainability – environmental, social, and economic – is increasingly recognised as the benchmark for all tourism business. As noted by the UN World Tourism Organisation, 57% of international tourist arrivals will be in emerging economies, by 2030. The various 'Tourism Terms' are defined as follows:

- ❖ **Ecotourism** - Responsible travel to natural areas that conserves the environment socially and economically sustains the well-being of local people and creates knowledge and understanding through interpretation and education of all involved (Including staff, travellers, and community residents).
- ❖ **Ethical Tourism**- Tourism is a destination where ethical issues are the key driver, e.g. social injustice, human rights, animal welfare, or the environment.
- ❖ **Geo Tourism**- Tourism that sustains or enhances the geographical character of a place- its environment, heritage, aesthetics, culture and well-being of its residents.
- ❖ **Pro-poor Tourism**- Tourism that results in increased net benefit for the poor people in a destination.
- ❖ **Responsible Tourism**- Tourism that maximizes the benefits to local communities minimizes negative social or environmental impacts and helps local people conserve fragile cultures and habitats or species.

- ❖ **Sustainable Tourism**- Tourism that leads to the management of resources in such a way that economic, social and aesthetic need can be fulfilled while maintaining cultural integrity, essential ecological processes, and biological diversity and life support systems.

Based on data collected by a survey by Travel Bureau, the following market profile of an eco tourist was constructed: -

- **AGE:** 35- 54 years old, although age varied with activity and other factors such as cost.
- **GENDER:** 50% female and 50% male, although clear differences based on activity was found.
- **EDUCATION:** - 82% were college graduates, a shift in interest in ecotourism from those who have high levels of education to those with less education was also found, indicating an expansion into mainstream markets.
- **HOUSEHOLD COMPOSITION:** No major differences were found between general tourists and experienced eco tourists.
- **PARTY COMPOSITION:** A majority (60%) of experienced ecotourism respondents stated that they prefer to travel as a couple, with only 15% stating they preferred to travel with their families, and 13% preferring to travel alone. (** experienced eco tourists= Tourists that had been on at least one "ecotourism" oriented trip.)
- **TRIP DURATION:** The largest group of experienced eco tourists (50 %) preferred trips lasting 8-14 days.
- **EXPENDITURE:** Experienced eco tourists were willing to spend more than the general tourists, the largest group (26%).
- **IMPORTANT ELEMENTS OF THE TRIP:** Experienced eco tourists top three responses were:
 - (a) wilderness setting, (b) wildlife viewing (c) hiking/trekking.
- **MOTIVATIONS FOR TAKING NEXT TRIP:** Experienced eco tourists top two responses were:
 - (a) enjoy scenery /nature, (b) new experiences /places.

On the basis of your reading of the passage, answer the following questions. [7x1=7]

i] In the line "..... recognized as the benchmark," the word "benchmark" DOES NOT refer to?

- a] A basis for something.
- b] The criterion required.
- c] The ability to launch something new.
- d] A standard point of reference.

ii] One of the elements that are important to ecotourists are?

- a] Wild and untouched things.
- b] Cultural exchange.
- c] Car and bus rides.
- d] Fully furnished flats.

iii] Choose the option that lists the correct answers for the following:

1. Asha Mathew, an NRI, loves animals and wishes to travel to places that safeguard their rights and inculcate awareness of their rights. What kind of a tourist is she?
2. Gurdeep Singh from the UK is an environmental scientist and has always chosen to travel to places that are examples of a symbiotic relationship between man and nature. What kind of a tourist is he?

- a] (1) is an eco tourist and (2) is a geo tourist.
- b] (1) is an ethical tourist and (2) is a geo tourist.
- c] (1) is a sustainable tourist and (2) is a pro-poor tourist.
- d] (1) is a geo tourist and (2) is a responsible tourist.

iv] According to the survey conducted by the Travel Bureau, the total percentage of experienced eco tourists who DID NOT refer to travel alone was?

- a] 60%.
- b] 75%.
- c] 15%.
- d] 13%.

v] The education aspect in the market profile of the eco tourist revealed that?

- a] Mainstream market trends were popular with undergraduates.
- b] Eco tourists were only those who had basic education.
- c] Mainstream markets were popular tourist destinations for educated eco tourists.
- d] Ecotourism was no more limited to the small group of highly educated travellers.

vi] According to the survey, one of the most powerful driving forces leading experienced ecotourism to invest in the new trip was?

- a] setting up workstations in new places.
- b] The opportunity to travel to new places.
- c] The chance to go camping in the wild.
- d] Competing with other eco tourists as frequent travellers.

vii] Choose the option that lists a statement that is NOT TRUE.

- a] Economically backward countries will benefit from sustainable tourism.
- b] The tourism business currently recognizes sustainability as an important factor.
- c] Emerging countries will receive negligible international tourists in the near future.
- d] The sustainability factor in tourism is a significant means of development.

3] Read the passage given below.

1.I remember my childhood as being generally happy and can recall experiencing some of the most carefree times of my life. But I can also remember, even more vividly,

moments of being deeply frightened. As a child, I was truly -terrified of the dark and getting lost. These fears were very real and caused me some extremely uncomfortable moments.

2.Maybe it was the strange way things looked and sounded in my familiar room at night that scared me so much. There was never total darkness, but a street light or passing car lights made clothes hung over a chair take on the shape of an unknown beast. Out of the corner of my eye, I saw curtains move when there was no breeze. A tiny creak in the floor would sound a hundred times louder than in the daylight and my imagination would take over, creating burglars and monsters. Darkness always made me feel helpless. My heart would pound and I would lie very still so that 'the enemy' wouldn't discover me.

3.Another childhood fear of mine was that I would get lost, especially on the way home from school. Every morning, I got on the school bus right near my home—that was no problem. After school, though, when all the buses were lined up along the curve, I was terrified that I would get on the wrong one and be taken to some unfamiliar neighbourhood. I would scan the bus for the faces of my friends, make sure that the bus driver was the same one that had been there in the morning, and even then ask the others over and over again to be sure I was in the right bus. On school or family trips to an amusement park or a museum, I wouldn't let the leaders out of my sight. And of course, I was never very adventurous when it came to taking walks or hikes because I would go only where I was sure I would never get lost.

4.Perhaps, one of the worst fears I had as a child was that of not being liked or accepted by others. First of all, I was quite shy. Secondly, I worried constantly about my looks, thinking people wouldn't like me because I was too fat or wore braces. I tried to wear 'the right clothes' and had intense arguments with my mother over the importance of wearing flats instead of saddled shoes to school. Being popular was very important to me then and the fear of not being liked was a powerful one.

5.One of the processes of evolving from a child to an adult is being able to recognise and overcome our fears. I have learnt that darkness does not have to take on a life of its own, that others can help me when I am lost and that friendliness and sincerity will encourage people to like me. Understanding the things that scared us as children helps to cope with our lives as adults.

1. On the basis of your reading 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 provide an appropriate title to it.** [5]

2. Write a **summary** of the passage in 80 words. [3]

SECTION-B GRAMMAR AND CREATIVE WRITING SKILLS [20 marks]

4] Fill in the blanks using appropriate tense forms of the verbs given in brackets. [5]

The match **(a)**_____ **(begin)** before we reached the stadium. There **(b)**_____ **(be)** a great rush at the gate. People **(c)**_____ **(argue)** with the security guards. Entering the stadium **(d)**_____ **(prove)** a tedious job. Everything seemed to be too chaotic. I **(e)**_____ **(be)** able to forget this nasty experience in the years to come.

5] Rearrange the following to form meaningful sentences. [5]

- a]** few/ had/ only been a/ rain/ minutes/ he/ since/ had walked/ It/ outside/ it began to/ when
- b]** her/ poet began an/ miss/ viewing/ after/ mother/ to/ image/ of her
- c]** on the platform/ vendors with/ were/ wares/ their/ selling/ flowers/ sweet-smelling/ the
- d]** to/ be/ her/ Sudha/ the/ hard/ class/ is/ working/ in/ order/ best
- e]** been/ Ambassador/ has/ Tendulkar/ named as the Rio Olympics' Brand/ sachin
- 6]** You are the Publicity Manager of WION TV Channel. Your Media Network is organizing a 'Talent Hunt Show' of college students to be telecast on your channel. Design a suitable **poster** in not more than **50 words** giving necessary details. [5]
- 7]** Write a **debate for/against the topic**, 'The generation gap is destroying family tradition and life' in **120-150 words**. You are Navtej /Navita. [5]

SECTION-C LITERATURE [35 marks]

8] Read the extracts given below and answer ANY ONE of the questions that follow. [4x1=4]

A] "At dawn on January 2nd, the waves were gigantic. We were sailing with only a small storm jib and were still making eight knots. As the ship rose to the top of each wave, we could see endless enormous seas rolling towards us, and the screaming of the wind was painful to the ears. To slow the boat down, we dropped the storm jib and lashed a heavy mooring rope in a loop across the stern."

a] Which figure of speech has been used in the line, "the waves were gigantic."?

- i] simile ii] oxymoron iii] irony iv] hyperbole

b] "Screaming of winds" here mean:

- i] sound of wind ii] direction of wind
iii] speed of wind iv] stormy winds

c] Which kind of fear was evident in the mind of the author during the incident mentioned in the extract?

- i] fear of death ii] fear of losing family soon
iii] fear of shipwreck iv] all of the above

d] What happened to Sue when the narrator went to check on the children?

OR

B] "My parents left me with her when they were to live in the city and we were constantly together. She used to wake me up in the morning and get me ready for school. She said her morning prayer in a monotonous sing-song while she bathed and dressed me in the hope that I would listen and get to know it by heart; I listened because...but never bothered to learn it."

a] Here, the phrase "Get to know by heart" means:

- i] appreciate ii] rely iii] memorise iv] revise

b] The author listened to her prayers because:

- i] she wanted him to listen properly ii] he wanted to learn it
iii] he loved her voice iv] she forced him to do so

c] What did the author's grandmother do after bathing and dressing him?

d] What did the author have in his breakfast?

9] Read the extracts given below and answer ANY ONE of the questions that follow. [4x1=4]

A] " CYRIL: [moving to the table; annoyed] Why not?

MRS. PEARSON: [coolly] I could not bother.

CYRIL: Feeling off-colour or something?

MRS. PEARSON: Never felt better in life.

CYRIL: [aggressively] What's the idea then?

MRS. PEARSON: Just a change.

CYRIL: [briskly] Well, snap out of it, Ma- and get cracking. Haven't too much time."

a] What can you say about Cyril from the given lines?

- i] he is dumb and acts superior in front of his mother.
ii] he is arrogant and egoistic .
iii] he always disrespects his mother.
iv] he takes his mother for granted.

ii] The phrase "feeling off-colour" means:

- a] feeling ill b] feeling tired c] feeling sleepy d] feeling lazy

iii] Why does Cyril act aggressive?

a] his mother insulted him

b] his mother had not made tea for him

c] he was getting late

d] his mother was behaving strangely

iv] According to Mrs. Pearson, where had Cyril been wasting his time and money?

OR

B] “Inside, a narrow stair led up to a small bedroom, clean but poorly furnished and lit only by an oil lamp. Here Mrs. Morgan’s mother, a tall, grey-haired woman of nearly seventy and the stout, elderly midwife waited beside the patient, watching Andrew’s expression as he moved about the room. ‘Let me make you a cup of tea, Doctor, bach,’ said the former quickly after a few moments. Andrew smiled faintly. He saw that the old woman, wise in experience, realised there must be a period of waiting that she was afraid he would leave the case, saying he would return later. ‘Don’t fret, mother, I’ll not run away.’”

a] Choose the statements that elaborate the description of the room.

I] The room is very bright and welcoming.

II] The room has dim lighting and a faint feeling.

III] The room is highly hygienic.

IV] The room is huge with poor furniture in it.

i] I and II

ii] I and III

iii] Only II

iv] III and IV

b] Why does Dr Andrew focus on the room more than the pregnant Mrs. Susan Morgan?

i] he is quickly assured that she does not need attention right away.

ii] he does not want to interrupt the midwife.

iii] the room is grand and beautiful to captivate him.

iv] he is bored and finds the details in the room interesting.

c] What are the old woman’s fears in the passage?

i] her daughter would not be healthy.

ii] her grandchild would die.

iii] the doctor was not interested in the case.

iv] the doctor would leave.

d] Why did Andrew say, “Don’t fret mother, I’ll not run away.” ?

10] Read the extracts given below and answer **ANY ONE** of the questions that follow. [4x1=4]

A] “When did my childhood go?

Was it the day I ceased to be eleven,

Was it the time I realised that Hell and Heaven,

Could not be found in Geography,

And therefore, could not be,

Was that the day!”

a] Who is the poet addressing in the given lines?

i] his mother

ii] his friends

iii] readers

iv] his father

b] When does the poet think he lost his childhood?

i] 10 years

ii] 11 years

iii] 12 years

iv] 13 years

c] Where has the poet used ‘Antithesis’ in the given stanza?

d] What is the tone of the poem that the above extract is taken from?

OR

B] “*Yet have I killed*

The seed I spent or sown it where,

The land is his and none of mine?

We speak like strangers, there is no sign

Of understanding in the air.

This child is built to my design

Yet what he loves I cannot share.”

a] What does the father feel in the given lines?

i] That his son is responsible for the situation

ii] they resemble each other

iii] that he is responsible for the situation

iv] their opinions are the same

b] What is the rhyme scheme of the given lines?

i] abccbcb

ii] abcabca

iii] ababacc

iv] no rhyme

c] Which poetic device is used in “The seed I spent or sown it where...” ?

d] What does the poet mean by the last line of the extract?

11] Answer **ANY TWO** of the following within 40-50 words. [3x2=6]

a] Why was Zahi Hawass worried? How did he get rid of it?

b] What is the significance of “yellow” in the poem “The Laburnum Top” ?

c] How does “rain” become the voice of the earth?

12] Answer **ANY TWO** of the following within 40-50 words. [2.5x2=5]

a] Mention some remarkable changes in Annie Pearson’s behaviour that shocked both Doris and Cyril. What possible reasons of change were thought of by her children?

b] Justify the title of the chapter “The Tale of Melon City.”

c] “A suspicious man would believe his eyes instead of his heart.” Who said these words? Why? [The Summer of the Beautiful White Horse.]

13] Answer **ANY ONE** of the following within 120-150 words. [6x1=6]

a] Draw a character sketch of Rajendra Deshpande based on your understanding of “The Adventure.”

b] “The root cause of the generation gap presented in the poem “Father to Son” lies in the fact that it is only the father talking to his son , rather than hearing or understanding the latter.” Explain.

14] Answer **ANY ONE** of the following within 120-150 words. [6x1=6]

a] Satire can be an effective tool for social reform. Keeping “The Tale of Melon City” in mind, express your views on the above statement.

b] “People like Mrs. Dorling forget the ultimate end of humans. For some earthly gains, people discard their values.” Elucidate.

General Instructions:

- I) All questions are compulsory.
- II) Question numbers 1-16 are multiple choice questions of one mark each.
- III) Question numbers 17-22 are of 2 marks each. Answers to these questions should not exceed 50 words each.
- IV) Question numbers 23-27 are of 4 marks each. Answers to these questions should not exceed 100 words each.
- V) Question numbers 28-29 are passage and map-based questions. Answer accordingly.
- VI) Question numbers 30-33 are of 6 marks each. Answers to these questions should not exceed 170 words.
- VII) There is an internal choice in 6 marks questions.

Section A

MCQS

[1X16=16]

1. 'The Republic' is the book of
 - a) Aristotle
 - b) Plato
 - c) Socrates
 - d) Karl Marx
2. In ancient Indian society, justice was associated with
 - a) Wrong doers
 - b) Pursue their chosen goals
 - c) One should be concerned with Justice
 - d) Dharma and maintaining dharma
3. The Right to protest is an aspect of
 - a) The freedom of religion
 - b) Right to constitutional remedies
 - c) The freedom of expression
 - d) None of the above
4. Members of Rajya Sabha are elected for
 - a) 6 years
 - b) 5 years
 - c) 4 years
 - d) 3 years
5. 74th amendment dealt with
 - a) Rural local bodies
 - b) Urban local bodies
 - c) Gram panchayat
 - d) Taluka panchayat
6. Who is known as father of Local government?
 - a) Lord Dalhousie
 - b) Warren Hastings
 - c) Lord Cornwallis
 - d) Lord Rippon

7. Kaveri/Cauvery water dispute is between

- a) Maharashtra and Punjab
- b) Tamil Nadu and Karnataka
- c) Punjab and Gujarat
- d) Madhya Pradesh and Chandigarh

8. Which one of the following Articles declares India as a 'Union of States'?

- a) Article 1
- b) Article 4
- c) Article 10
- d) Article 6

9. Our country is divided into

- a) 540 Constituencies
- b) 550 Constituencies
- c) 543 Constituencies
- d) 552 constituencies

10. The council of ministers is headed by

- a) Prime Minister
- b) President
- c) Both
- d) None of these

11. 'Hind Swaraj' was written by

- a) Nehru
- b) Mahatma Gandhi
- c) Subhas Chandra Bose
- d) B.R. Ambedkar

12. 'Freedom from fear' is a book written by

- a) Rabindranath Tagore
- b) Mahatma Gandhi
- c) Nelson Mandela
- d) Aung San Suu Kyi

13. Which Fundamental Right is known as 'Heart and Soul' of the constitution?

- a) Right to freedom
- b) Right to constitutional remedies
- c) Right to freedom of speech
- d) Cultural and educational Right

14. In which year Rajiv Gandhi was assassinated?

- a) 12th July 1992
- b) 14th Aug 1993
- c) 21st May 1991
- d) 31st Sep 1994

15. Natural Rights are those which are given to us by

- a) God or Nature
- b) Parliament
- c) Constitution
- d) King

16. In which year Indian Constitution was adopted?

- a) 26th Jan 1950
- b) 24th Jan 1949
- c) 24th Nov 1949
- d) 26th Nov 1949

SECTION B

[2X6=12]

- 17. Define Political Theory. 2
- 18. What are the two evils of Right against exploitation? 2
- 19. What are the two goals of Directive Principles? 2
- 20. What do you mean by Federalism? 2
- 21. What is Article 16(4)? 2

22.What do you mean by Prevention Detention?

2

Section C

[4x5=20]

23.Explain any two dimensions of Equality.

4

24.What are the four important functions of a constitution?

4

25.What is the structure of the judiciary and how it functions?

4

26.Explain any four functions of Election Commission of India.

4

27.Define any four types of writs in Indian Constitution.

4

Section D

[1X4=4]

28.Read the passage given below carefully and answer the following questions.

4

In 1978 the constitution of Sri Lanka was amended and the system of Executive Presidency was introduced. Under the system of Executive Presidency, people directly elect the President. It may happen that both the President and the Prime Minister belong to the same political party or to different political parties.

The President has vast powers under the constitution. The President chooses the Prime Minister from the party that has a majority in the Parliament. Though ministers must be members of the Parliament, the President has the power to remove the Prime Minister, or ministers. Apart from being the elected Head of State and commander-in-Chief of the Armed Forces, the President is also the Head of the Government.

Questions:

i)What was introduced in 1978?

ii)Who has the vast powers under the constitution?

iii)Who has elected president and in which system?

iv)Who has the power to remove PM and Ministers?

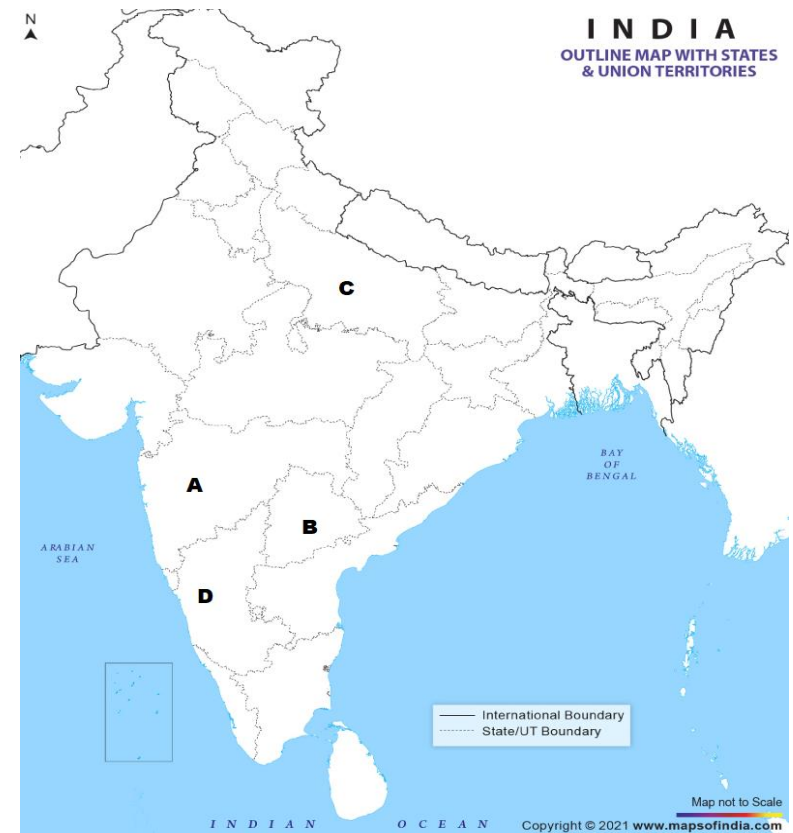
29.Map-Based Questions

In the given outline political map of India, four states have been marked as (A) (B) (C) and (D).

Identify the four states having a bicameral legislature and name the states marked A,B,C and D respectively in the given map.

Name four states having a bicameral legislature.

4



Section E

[6x4=24]

30.What are the important provisions that create a strong Central government? 6

OR

Explain six Fundamental rights of the constitution.

31.Make a comparison between FPTP and PR system of election. 6

OR

Differentiate between the Indian model and western model of Secularism.

32.Mention any six points or functions of National Human Rights Commission. 6

Or

What are the key ideas and concepts associated with federalism?

33.Explain any six powers of Rajya Sabha and Lok Sabha. 6

Or

What is Independence of Judiciary? What are the four Jurisdiction of supreme court of India? 2+4=6

India – Physical Environment

SECTION A (MCQ) (7 x 1)

1] Choose the state in India through which Tropic of Cancer passes.

- a) Uttar Pradesh b) Madhya Pradesh
c) Andhra Pradesh d) Himachal Pradesh

2] Which of the mountain system is the oldest according to geological history?

- a) Nilgiri b) Satpura c) Vindhyas d) Aravali

3] Which of the following features are NOT formed by the Himalayan Rivers in their mountainous course?

- a) Gorges b) Meanders c) Water Falls d) Rapids

4) Name the main watershed of the peninsular rivers

- a) Eastern Ghats b) Western Ghats c) Satpuras d) Vindhyas

5) Which of the following types of soils contain large proportion of sodium, potassium and magnesium?

- a) Forest b) Laterite c) Usara d) Red & Yellow

6) Which of the following pairs of states have very high proportion of black soils?

- a) Maharashtra & Madhya Pradesh b) Tamil Nadu & Kerala
c) Gujarat & Odisha d) Uttar Pradesh & Madhya Pradesh

7) The drainage pattern resembling the branches of a tree is known as

- a) dendritic b) radial c) trellis d) centripetal

SECTION B (SOURCE BASED QUESTION) (4 x 1)

8] Read the following extract and answer the questions that follow.

Consequences of Drought

Droughts have cascading effects on various other aspects of environment and society. Crop failure leading to scarcity of food grains (*akal*), fodder (*trinkal*), inadequate rainfall, resulting in shortage of water (*jalkal*), and often shortage in all the three (*trikal*) is most devastating. Large-scale death of cattle and other animals, migration of humans and livestock are the most common sight to be seen in the drought affected areas. Scarcity of water compels people to consume contaminated water resulting in spread of many waterborne diseases like gastro-enteritis, cholera, hepatitis, etc. Droughts have both immediate as well as long-term disastrous consequences on the social and physical environments. Consequently, planning for drought has to take both aspects into consideration. Provision for the distribution of safe drinking water, medicines for the victims and availability of fodder and water for the cattle and shifting of the people and their livestock to safer places, etc. are some steps that need to be taken immediately. Identification of ground water potential in the form of aquifers, transfer of river water from the surplus to the deficit areas, and particularly planning for inter-linking of rivers and construction of reservoirs and dams, etc. should be given a serious thought. Remote sensing and satellite imageries can be useful in identifying the possible river-basins that can be inter-linked and in identifying the ground water potential. Dissemination of knowledge about drought-resistant crops and proper training to practise the same can be some of the long-term measures that will be helpful in drought-mitigation. Rainwater harvesting can also be an effective method in minimising the effects of drought.

8a) How does drought affect human health?

8b) Which of the following can be useful in identifying the ground water potential?

i) Rainwater harvesting

ii) taking help of remote sensing and satellite imageries

iii) Dissemination of knowledge about drought-resistant crops

iv) planning for inter-linking of rivers and construction of reservoirs and dams,

8c) Suggest a long-term measure that will be helpful in drought-mitigation.

8d) Mention one demerit of inter-linking river basins.

SECTION C (LONG ANSWER) (19)

9) How and when the Indo-Ganga-Brahmaputra Plain originated? 3

OR

What is the location of the Great Indian Desert? Why is this desert also known as Marusthali? 3

10) Describe the characteristic features of black soils.

11) "It is a common experience that human-made disasters have increased both in their numbers and magnitudes over the years"- Give reasons to justify the statement. 3

12) Into how many drainage systems is Indo-Brahma River dismembered? What are the reasons for this dismemberment? 5

13) In respect to Tropical Evergreen Forests write about

- a) distribution b) climatic requiremt
c) Characteristic features d) major species 1+1+2+1

OR

What are the aims of New Forest Policy of 1988?

Fundamentals of Physical Geography

SECTION – A

1] *Perigee* occurs on 1

- a) 3rd January b) 4th July c) both (a) & (b) d) None

2] The following is not part of *Minor Relief features* of ocean floor 1

- a) guyots b) seamount c) deep sea plain d) atolls

3] The following is not favourable for the formation and intensification of *tropical cyclones* 1

- a) presence of the Coriolis force
b) large sea surface
c) meeting of warm and cold air masses
d) a pre-existing weak low pressure area

4] The sun is directly overhead at noon on 23rd September at 1

- a) 23½°S b) 0° c) 23½°N d) 66½°S

5] *Eskers* is a depositional feature associated with 1

- a) wind b) running water c) underground water d) glacier

6] Which one of the following is a *gradational process*? 1

- a) diastrophism b) deposition c) erosion d) volcanism

7] *Polar fleeing force* relates to 1

- a) tides b) rotation of the earth
c) gravitation d) revolution of the earth

SECTION – B (4 x 1)

8] Answer the following questions :

- a) What is a *thermocline*?
b) Define *hydrological cycle*.
c) When does *frost* forms?
d) What is *ITCZ*?

SECTION – C (19)

9] Earth initially was a barren, rocky and hot object with a thin atmosphere of hydrogen and helium. The present composition of earth's atmosphere is chiefly contributed by nitrogen and oxygen.

Explain the factors that led to formation of the present atmosphere. 3

10] What is *weathering*? Mention the three major groups of weathering processes. 3

11] The Plate Tectonics theory has helped us in understanding the formation of continents and ocean basins. Name the geologists those who proposed the concept of Plate Tectonics. What does the theory of Plate Tectonics suggest? 3

12] What do we understand by the term salinity of ocean water? Mention the factors that affect ocean salinity. 1+4

13] Name the factors that causes variations in insolation. 5

OR

Name three erosional and two depositional landforms associated with glacial activity. Mention their formation and characteristic features a mentioned by you. 5

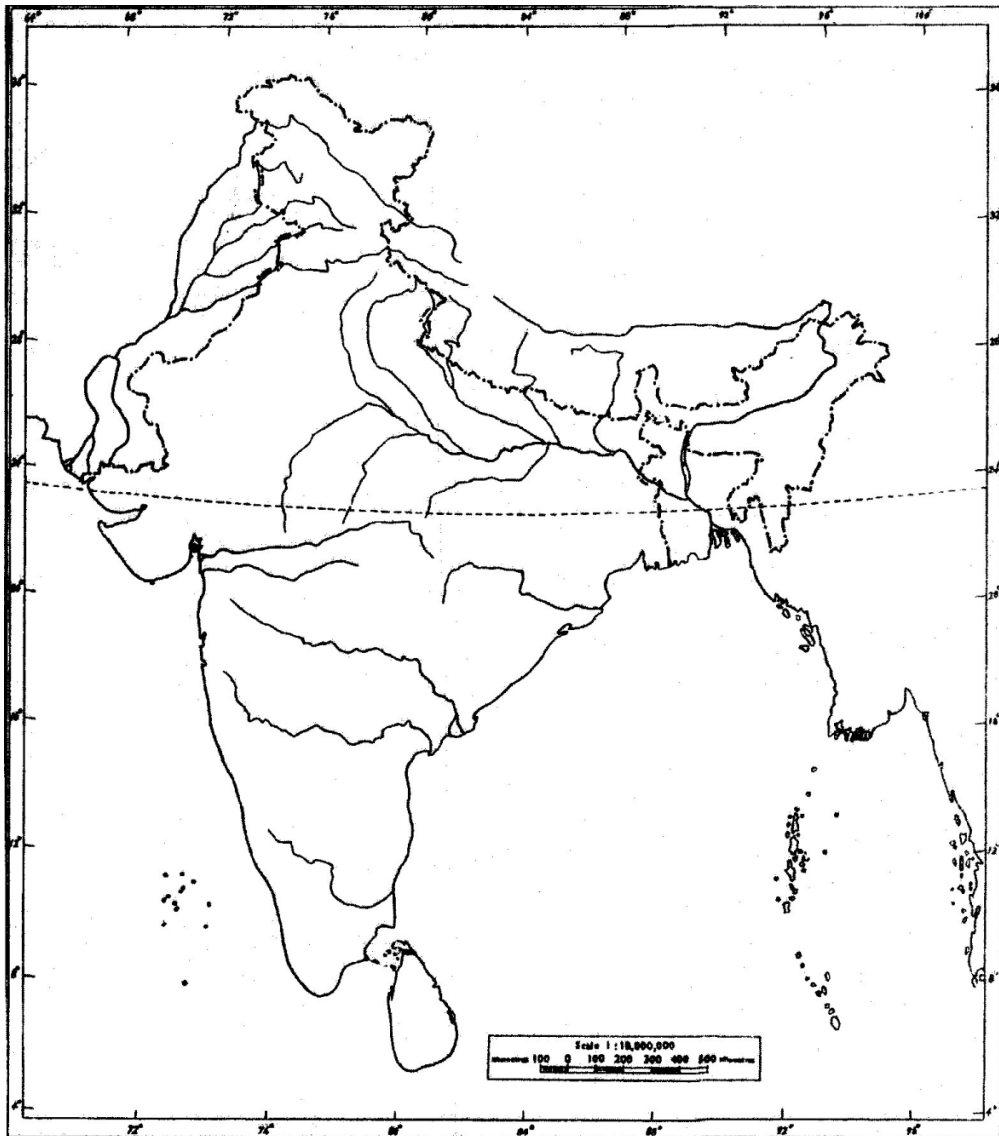
SECTION – D (5)

14] Draw a simplified diagram to show the general circulation of the atmosphere. Mention the different pressure zones, planetary winds and the different atmospheric cells.

India – Physical Environment : SECTION D (MAP) (5 x 1)

Q. 14. On the outline map of India indicate and mark the following features
(Attempt any 5).

- a) A river which does not form delta
- b) Nilgiri Hills
- c) An area with mountain forest
- d) Malabar Coast
- e) The neighbouring country which is separated by the Palk Strait.
- f) Nanda Devi Biosphere Reserve



General instructions:

1] This question paper contains two parts:

Part A – Micro economics (40 marks)

Part B – Statistics (40 marks)

2] Marks for questions are indicated against each question.

3] This paper contains 20 Multiple Choice Questions type questions of 1 mark each.

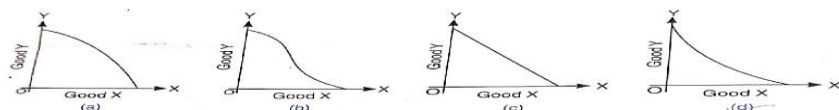
4] This paper contains 4 Short Answer Questions type questions of 3 marks each to be answered in 60 to 80 words,

5] This paper contains 6 Short Answer Question type questions of 4 marks each to be answered in 80 to 100 words.

6] This paper contains 4 long Answer Questions type questions of 6 marks each to be answered in 100 to 150 words.

PART A (MICRO ECONOMICS)

1] In case of decreasing MRT, the shape of PPC will be depicted by the following diagram: (Choose the correct diagram) 1



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2] An indifference curve represents all those combination of two goods which give: 1

- a] No satisfaction to the consumer
- b] Lower satisfaction to the consumer
- c] Higher satisfaction to the consumer
- d] Equal satisfaction to the consumer

3] Read the following statements carefully:

Statement 1: In case of Giffen goods, demand rises with increase in price.

Statement 2: For goods of ostentation, demand rises with increase in price.

In the light of the given statements, choose the correct alternative: 1

- a] Statement 1 is true and statement 2 is false
- b] Statement 1 is false and statement 2 is true
- c] Both statements 1 and 2 are true
- d] Both statement 1 and 2 are false

4] Which one of these is a determinant of individual demand? 1

- a] Size and composition of population
- b] Price of related goods
- c] Distribution of income
- d] Season and weather

OR

Read the following statements carefully:

Statement 1: If a good takes up significant share of consumer's budget, it will be less elastic.

Statement 2: Elasticity of demand can vary only between – 1 and + 1.

In the light of the given statements, choose the correct alternative:

- a] Statement 1 is true and statement 2 is false
- b] Statement 1 is false and statement 2 is true
- c] Both statements 1 and 2 are true
- d] Both statement 1 and 2 are false

5] Choose the correct alternative to be filled in given blank. 1

_____ is the period of time in which all the factors of production are variable.

- a] Short run
- b] very short run
- c] long run
- d] medium run

6] A firm is producing 20 units. At this level of output ATC and AVC are Rs 40 and Rs 37 respectively. Find out the total fixed cost of the firm. 1

- a] Rs 60
- b] Rs 20
- c] Rs 3
- d] none of these

7] When price remains same with rise in output, AR curve is: 1

- a] Vertical straight line parallel to Y axis
- b] Positively sloped
- c] Horizontal straight line parallel to X axis
- d] downward sloping

8] In the following schedule producer's equilibrium is at _____ 1

Output (units)	1	2	3	4	5
MR (Rs)	10	10	10	10	10
MC(Rs)	12	10	8	10	15

- a] 2 units b] 4 units c] 3 units d] 5 units

9] Read the following statements – Assertion (A) and Reason (R)

Assertion (A): Total revenue curve is a positively sloped straight line when price remains same at all levels of output.

Reason (R): Total revenue is at its maximum point when marginal revenue is zero.

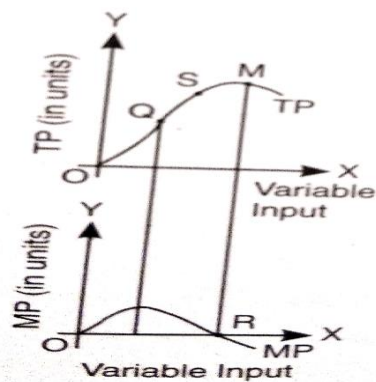
From the given alternative choose the correct one: 1

Alternatives:

- a Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- b Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).
- c Assertion (A) is true but Reason(R) is false
- d Assertion (A) is false but Reason (R) is true.

10] 'Point of inflexion' is represented by: 1

- a] Point M b] Point Q
- c] Point R d] Point S



11] Draw a production possibility curve. What do the points inside and outside this curve indicate? Explain. 3

12] Explain that higher indifference curve give higher satisfaction. 3

OR

Why should consumer's equilibrium point be located on the budget line? Page 3

13] Distinguish between substitute goods and complementary goods with examples. 4

14] What is the degree of elasticity of demand in case of the following demand curves? Explain briefly with reasons. 4

- i] Straight line parallel to X axis ii] Straight line parallel to Y axis
- iii] A rectangular hyperbola curve iv] A steep demand curve

15] i] Explain the conditions of perfectly competitive market. 2

ii] Why is a firm under perfect competition a price taker? 2

OR

Draw a diagram showing TVC in terms of the area under MC curve.

16] Read the following case study carefully and answer the questions on the basis of the same.

With a price floor, the government may decide that the equilibrium price is not high enough and is causing social problems, For instance, the American farmer, through technology and science, is a producer of large amount of food products. This has, however, not been to the farmer's advantage when there is a large supply and not as much as demand, the price drops. This has been the case with American farmers, large supplies, low demand, low prices. Low prices result in low incomes. In order to offset this, the government has enacted price supports to raise the price of agricultural products.

- a] Define price floor. 1
- b] How is equilibrium price affected by excess supply? 2
- c] How does government tackle the situation if there is surplus production? Explain with diagram. 3

17] State whether the following statements are true or false. Give reasons for your answer.

- i] Supply and quantity supplied are identical terms. 2
- ii] Market supply schedule refers to supply schedule of the industry as a whole. 2
- iii] Zero elasticity of supply refers to a vertical straight line supply curve. 2

OR

a] The price elasticity of supply of a commodity is 2. When its price falls from Rs 10 per unit to Rs 8 per unit, its quantity supplied falls by 500 units. Calculate the quantity supplied at the reduced price.

b] Discuss the relationship between AR and MR when:

- i] Price remain constant
- ii] Price falls with rise in output.

PART B (STATISTICS)

18] Choose the correct pair of alternatives given in column A with those in column B.

1

	Column A		Column B
i	Captions	a	Heading of horizontal rows of a table
ii	Frequency	b	Attributes whose value varies from one investigation to another.
iii	Kinked line	D	It is used to reduce the distance between '0' and minimum value on the Y axis.
iv	False base line	D	It is used to reduce the gap between '0' and the smallest value of the variable on the Y axis.

Options:

- a] i – a
- b] ii – b
- c] iii – c
- d] iv – d

19] Fill in the blanks:

_____ explains the specific feature of the data content of the table which is not self explanatory and has not been explained earlier.

1

- a] Head note
- b] Source note
- c] Title
- d] Footnotes

20] The formula of calculating arithmetic mean of a continuous series using short-cut method is:

1

- a] $\bar{X} = \frac{\sum fm}{\sum f}$
- b] $\bar{X} = A + \frac{\sum fd}{\sum f}$
- c] $\bar{X} = A + \frac{\sum fd'}{\sum f} \times c$
- d] $\bar{X} = A + \frac{\sum fd}{\sum f} \times c'$

21] Read the following statements carefully:

Statement 1 – In the multiple bar diagram we make comparison between two or more variables.

Statement 2 – The other name of sub –divided bar diagram is component bar diagram.

In the light of the given statements, choose the correct alternative:

1

- a] Statement 1 is true and statement 2 is false
- b] Statement 1 is false and statement 2 is true
- c] Both statements 1 and 2 are true
- d] Both statement 1 and 2 are false

22] Read the following statements carefully:

Statement 1 – The principle of drawing graph is that the Y- axis must start from zero.

Statement 2 – If more than one variable is plotted on the same graph, it can't be distinguished by the same line.

In the light of the given statements, choose the correct alternative:

1

- a] Statement 1 is true and statement 2 is false
- b] Statement 1 is false and statement 2 is true
- c] Both statements 1 and 2 are true
- d] Both statement 1 and 2 are false

23] Index number for the base period is always taken as:

1

- a] 100
- b] 50
- c] 1
- d] 200

24] When r = 1, all the points in a scatter diagram would lie

1

- a] On a straight line
- b] Away from the straight line
- c] On a straight line directed either from lower left to upper left or from upper left to lower right.
- d] None of the above

25] While preparing time series graph, we show time on _____

1

- a] Positive side of X axis.
- b] Positive side of Y axis
- c] Negative side of X axis
- d] Negative side of Y axis

26] Read the following statements carefully:

Statement 1 – In 'more than' ogive we begin from lower limit of the first class interval.

Statement 2 – A frequency curve is drawn by joining the mid- points of all tops of a histogram by straight lines.

In the light of the given statements, choose the correct alternative: 1

- a] Statement 1 is true and statement 2 is false
- b] Statement 1 is false and statement 2 is true
- c] Both statements 1 and 2 are true
- d] Both statement 1 and 2 are false

27] Which average is affected most by the presence of extreme items? 1

- a] Median
- b] Mode
- c] Arithmetic mean
- d] none of these

OR

In case of an even number observation, which of the following is median?

- a] Weighted average of the two middle values
- b] Simple average of the two middle values
- c] Any of the two middle – most values
- d] None of these

28] Find the mean from the following table: 3

Mid-points	5	15	25	35	45
Frequency	10	20	30	20	10

29] The mean monthly salary paid to all employees in a certain company was Rs 600. The mean monthly salaries paid to male and female employees were Rs 620 and Rs 520 respectively. Find the percentage of male to female employees in the company. 3

OR

The ranks of 8 students in tests in Mathematics and Statistics were as follows:

Ranks in Mathematics	1	2	3	4	5	6	7	8
Ranks in Statistics	4	2	1	6	8	3	5	7

Calculate the coefficient of rank correlation.

30] There were 80 persons in a trip organized by a school. Out of which 60 were students, 14 were teachers and 6 (all males) were peons. Out of total persons, 16 were females including one lady teacher. Present the above information in a table. 4

31] We have the following data on the monthly expenditure on food (in rupees) for 30 households in a locality. Page 7

115	159	196	205	212	223
256	271	310	129	335	169
184	234	245	241	265	298
144	135	172	173	229	243
220	238	278	243	220	238

(i) Obtain a frequency distribution using following class intervals: 3

100 - 150, 150 – 200, 200 – 250, 250 – 300, 300 – 350.

(ii) Find the number of households spend less than Rs 250 per month. 1

OR

Convert the following table into exclusive series and find out the median.

Class interval	10-19	20-29	30-39	40-49	50-59
Frequency	3	9	8	7	13

32] Find out index value from the following data using (i) Laspeyre's Method (ii)

Paasche's Method. 4

Items	Base year Quantity	Base year Price(Rs)	Current year Quantity	Current year Price (Rs)
A	6	10	8	12
B	4	15	5	20
C	5	8	3	16
d	3	9	6	1

33] (i) Draw histogram and frequency polygon for the following distribution. Find

Mode graphically from the histogram. 4

(ii) Check the answer by using formula. 2

Age (years)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No of people	30	40	60	100	70	40	30	20

OR

Following data shows the construction of a house in Delhi. Present the information in the form of a pie diagram.

Items	Labour	Bricks	Cement	Steel	Timber	Stones
Expenditure (%)	25	15	20	15	10	15

34] Find out Karl Pearson's coefficient of correlation between X and Y and comment on their relationship. 6

X	7	8	12	15	16	26	21
Y	8	13	16	18	20	29	36

General Instructions:

1. This Question paper contains- **five** sections **A, B, C, D and E**. Each section is compulsory. However, there are internal choices in some questions.
2. **Section A** has **18 MCQ's and 2 Assertion-Reason** based questions of **1** mark each.
3. **Section B** has **5 Very Short Answer** type questions of **2** marks each.
4. **Section C** has **6 Short Answer** type questions of **3** marks each.
5. **Section D** has **5(attempt 4)** Long Answer type questions of **5** marks each.
6. **Section E** has **3** case based integrated units of assessment of **4** marks each with sub parts.

SECTION A

[1x20=20]

- 1] If X and Y are two sets and X' denotes the complement of X , then $X \cap (X \cup Y)'$ is equal to
 a] X b] Y c] \emptyset d] $X \cap Y$
- 2] Let $f(x) = \sqrt{1+x^2}$, then
 a] $f(xy) = f(x) \cdot f(y)$ b] $f(xy) \geq f(x) \cdot f(y)$
 c] $f(xy) \leq f(x) \cdot f(y)$ d] None of these
- 3] If $\tan \theta = 3$ and θ lies in the third quadrant, then the value of $\sin \theta$ is
 a] $\frac{1}{\sqrt{10}}$ b] $-\frac{1}{\sqrt{10}}$ c] $\frac{-3}{\sqrt{10}}$ d] $\frac{3}{\sqrt{10}}$
- 4] Which of the following is correct for any two complex numbers z_1 and z_2 ?
 a] $|z_1 z_2| = |z_1| |z_2|$ b] $\arg(z_1 z_2) = \arg(z_1) \cdot \arg(z_2)$
 c] $|z_1 + z_2| = |z_1| + |z_2|$ d] $|z_1 + z_2| \geq |z_1| - |z_2|$
- 5] If $-3x + 17 < -13$ then
 a] $x \in (10, \infty)$ b] $x \in [10, \infty)$
 c] $x \in (-\infty, 10]$ d] $x \in [-10, 10]$
- 6] The total number of 9 digit numbers which have all different digits is
 a] 10! b] 9! c] $9 \times 9!$ d] $10 \times 10!$
- 7] Everybody in a room shakes hands with everybody else. If the total number of handshakes is 66, find the total number of people in the room.
 a] 11 b] 12 c] 13 d] 14
- 8] A single letter is selected at random from the word 'PROBABILITY'. The probability that it is a vowel is
 a] $\frac{1}{3}$ b] $\frac{4}{11}$ c] $\frac{2}{11}$ d] $\frac{3}{11}$

9] Seven people are to be seated in a row. The probability that two particular people sit next to each other is

- a] $\frac{1}{3}$ b] $\frac{1}{6}$ c] $\frac{2}{7}$ d] $\frac{1}{2}$

10] Coefficient of variation of two distributions are 50 and 60, and their arithmetic means are 30 and 25 respectively. Difference of their standard deviation is

- a] 0 b] 1 c] 1.5 d] 2.5

11] Let x_1, x_2, \dots, x_n be n observations and \bar{x} be their arithmetic mean. The formula for the standard deviation is given by

- a] $\sum (x_i - \bar{x})^2$ b] $\frac{\sum (x_i - \bar{x})^2}{n}$
 c] $\sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$ d] $\sqrt{\frac{\sum x_i^2}{n} + \bar{x}^2}$

12] $\lim_{x \rightarrow 0} \frac{|x|}{x}$ is equal to

- a] 1 b] -1 c] 0 d] Does not exist

13] If $f(x) = x \sin x$, then $f'(\frac{\pi}{2})$ is equal to

- a] 0 b] 1 c] -1 d] $\frac{1}{2}$

14] If the sum of n terms of an A.P. is given by $S_n = 3n + 2n^2$, then the common difference of the A.P. is

- a] 3 b] 2 c] 6 d] 4

15] The distance of the point P (1, -3) from the line $2y - 3x = 4$ is

- a] 13 b] $\frac{7}{13} \sqrt{13}$ c] $\sqrt{13}$ d] None of these

16] Slope of a line which cuts off intercepts of equal lengths on the axes is

- a] -1 b] 0 c] 2 d] $\sqrt{3}$

17] The length of the latus rectum of the ellipse $3x^2 + y^2 = 12$ is

- a] 4 b] 3 c] 8 d] $\frac{4}{\sqrt{3}}$

18] L is the foot of the perpendicular drawn from a point (6, 7, 8) on x-axis. The coordinates of L are

- a] (6, 0, 0) b] (0,7,0) c] (0,0,8) d] None of these

In questions 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason(R)**. Choose the correct option.

- (a) Both **A** and **R** are true and **R** is the correct explanation of **A**.
 (b) Both **A** and **R** are true and **R** is not the correct explanation of **A**.
 (c) **A** is true but **R** is false. (d) **A** is false but **R** is true.

19] **Assertion (A):** In rolling a dice, event $A = \{1,3,5\}$ and event $B = \{2,4\}$ are mutually exclusive events.

Reason (R): In a sample space, two events are mutually exclusive if they do not occur at the same time.

20] **Assertion (A):** If $A = \{1,2,3\}$, $B = \{2,4\}$, then the number of relations from A to B is equal to 24.

Reason (R): The total number of relations from set A to set B equal to $2^{n(A).n(B)}$

SECTION B

[2x5=10]

21] Express $z = -4 + i4\sqrt{3}$ in polar form.

22] Solve the system of linear inequations and represent the solution on a number line:

$$3x - 7 > 2(x - 6) \text{ and } 6 - x > 11 - 2x$$

23] A mathematics question paper consists of 10 questions divided into two parts I and II, each containing 5 questions. A student is required to attempt 6 questions in all, taking at least 2 questions from each part. In how many ways can the student select the questions?

24] Find the equation of the line which passes through the point $(-3, -2)$ and cuts off intercepts on x and y axes which are in the ratio 4:3.

25] Find the coordinates of the point R which divides the join of the point $P(0,0,0)$ and $Q(4, -1, -2)$ in the ratio 1 : 2 externally and verify that P is the mid-point of RQ .

SECTION C

[3x6=18]

26] Prove that: $\frac{(\sin 7x + \sin 5x) + (\sin 9x + \sin 3x)}{(\cos 7x + \cos 5x) + (\cos 9x + \cos 3x)} = \tan 6x$

27] Find the fourth term from the beginning and the 5th term from the end in the expansion of $\left(\frac{x^3}{3} - \frac{3}{x^2}\right)^{10}$

28] Find the lengths of the major and minor axes, the coordinates of foci, the vertices, the eccentricity and the length of the latus rectum of the ellipse

$$\frac{x^2}{169} + \frac{y^2}{144} = 1$$

29] Find the domain of the function f given by $f(x) = \frac{1}{\sqrt{[x]^2 - [x] - 6}}$

30] Find the sum of the following series upto n terms: $5 + 55 + 555 + \dots$

31] For what values of m , are the roots of the equation

$$(3m + 1)x^2 + (11 + m)x + 9 = 0$$

i] Equal

ii] Real and unequal

iii] Imaginary

SECTION D

[5x4=20]

(Attempt any four out of five questions from this section)

32] Given that $y = \sqrt{\frac{1-x}{1+x}}$ show that $(1 - x^2) \frac{dy}{dx} + y = 0$

33] If $f(x) = \frac{1+x}{1-x}$ show that $f[f(\tan \theta)] = -\cot \theta$

34] Solve the following system of inequalities graphically:

$$x + 2y \leq 8, 2x + y \leq 8, x \geq 0, y \geq 0.$$

35] A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18%?

36] Find the number of arrangements of the letters of the word INDEPENDENCE.

Further, in how many of these arrangements,

i] do the words start with P

ii] do all the vowels always occur together

iii] do the vowels never occur together

iv] do the words begin with I and end in P.

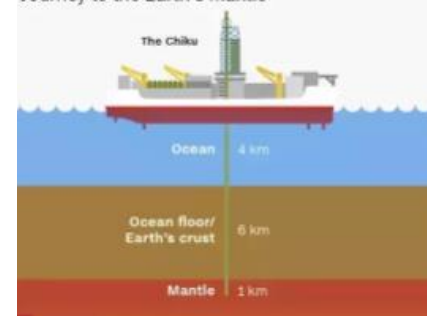
SECTION E

[4x3=12]

37] In drilling world's deepest hole, the Kola Superdeep Borehole, the deepest manmade hole on Earth and deepest artificial point on Earth, as a result of a scientific drilling project, it was found that the temperature T in degree Celsius, x km below the surface of Earth, was given by:

$$T = 30 + 25(x - 3), \quad 3 < x < 15$$

Journey to the Earth's mantle



If the required temperature lies between 200°C and 300°C , then

i] The depth, x will lie between

a] 9 km and 13 km

b] 9.8 km and 13.8 km

c] 9.5 km and 13.5 km

d] 10 km and 14 km

- ii] Solve for : $-9x + 2 > 18$ or $13x + 15 \leq -4$
 a] $x \leq -19/13$ b] $x < -16/13$
 c] $-16/13 < x < -19/13$ d] There are no solutions.

- iii] If $|x| < 5$ then the value of x lies in the interval
 a] $(-\infty, -5)$ b] $(\infty, 5)$
 c] $(-5, \infty)$ d] $(-5, 5)$

OR

Graph the following inequality on the number line: $x > -32$

38] A state cricket authority has to choose a team of 11 members, so the authority asks 2 coaches of a government academy to select the team members that have experience as well as the best performers in the last 15 matches. They can make up a team of 11 cricketers amongst 15 possible candidates. In how many ways can the final eleven be selected from 15 cricket players if:



- i] There is no restriction
 a] 1365 b] 2365 c] 1465 d] 1375
- ii] One of them must be included
 a] 1002 b] 1003 c] 1001 d] 1004
- iii] Two of them being leg spinners, one and only one leg spinner must be included
 a] ${}^2C_1 \times {}^{13}C_{10}$ b] ${}^2C_1 \times {}^{10}C_{13}$
 c] ${}^1C_2 \times {}^{13}C_{10}$ d] ${}^2C_{10} \times {}^{13}C_{10}$

OR

If there are 6 bowlers, 3 wicket-keepers, and 11 batsmen in all. The number of ways in which a team of 4 bowlers, 2 wicket-keepers, and 5 batsmen can be chosen.

- a] ${}^6C_4 \times {}^3C_2 \times {}^{11}C_5$ b] ${}^6C_2 \times {}^3C_4 \times {}^{11}C_5$
 c] ${}^6C_4 \times {}^3C_2 \times {}^{11}C_5$ d] ${}^6C_2 \times {}^3C_2 \times {}^{11}C_5$

39] Father of Ashok is a builder, He planned a 12 story building in Gurgaon sector 5. For this, he bought a plot of 500 square yards at the rate of Rs 1000 /yard². The builder planned ground floor of 5 m height, first floor of 4.75 m and so on such that each floor is 0.25 m less than its previous floor.



- i] What is the height of the last floor?
 a] 2.5 m b] 2.75 m c] 2.25 m d] 3 m
- ii] Which floor no is of 3 m height?
 a] 5 b] 7 c] 10 d] 9
- iii] Up to which floor the height is 33 m?
 a] 8 b] 7 c] 10 d] 9
- OR**
- Which floor no. is half in height of ground floor?
 a] 10 b] 9 c] 12 d] 11

General Instructions:

- (i) There are 35 questions in all. All questions are compulsory.
- (ii) This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
- (iii) Section A contains eighteen MCQ of 1 mark each, Section B contains seven questions of two marks each, Section C contains five questions of three marks each, section D contains three long questions of five marks each and Section E contains two case study based questions of 4 marks each.
- (iv) There is no overall choice. However, an internal choice has been provided in section B, C, D and E. You have to attempt only one of the choices in such questions.
- (v) Use of calculators is not allowed.
- (vi) Diagrams must be drawn wherever applicable.

Section – A

1. A force F is given by $F = at + bt^2$, where t is the time, the dimensions of 'a' and 'b' are:

- (a) $[MLT^{-3}]$ and $[MLT^{-4}]$
- (b) $[MLT^{-4}]$ and $[MLT^{-3}]$
- (c) $[MLT^{-1}]$ and $[MLT^{-2}]$
- (d) $[MLT^{-2}]$ and $[MLT^0]$

2. Which of the following has the highest number of significant figures:

- (a) 0.007 m^2
- (b) $2.64 \times 10^{24} \text{ kg}$
- (c) 0.0006032 m^2
- (d) 6.3200 J

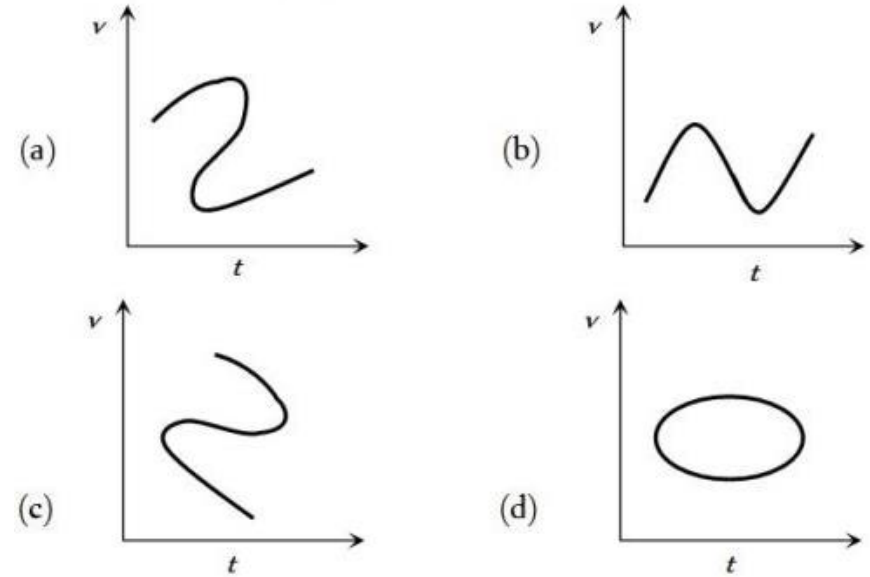
3. A person is standing in an elevator. In which situation he finds his weight less?

- (a) When the elevator moves upward with constant acceleration
- (b) When the elevator moves downward with constant acceleration
- (c) When the elevator moves upward with uniform velocity
- (d) When the elevator moves downward with uniform velocity

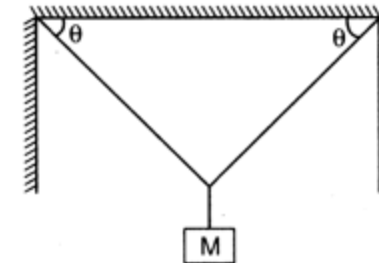
4. The angular momentum of a moving body remains constant if

- (a) net external force is applied
- (b) net external torque is applied
- (c) net pressure is applied
- (d) net external torque is not applied

5. Which of the following velocity-time graphs shows a realistic situation for a body in motion?



6. Find the tension in the string if $\theta = 30^\circ$ and the mass hanging in the middle of the string is equal to 22 kg.

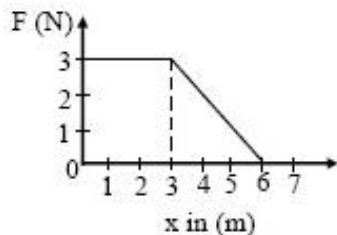


- (a) 110 N
- (b) 220 N
- (c) Infinite
- (d) Between 110 N and 220 N

7. A body is projected vertically from the earth reaches a height equal to earth's radius before returning to earth. The power exerted by the gravitational force is greatest

- (a) at the highest position of the body
- (b) at the instant just before the body hits the earth
- (c) it remains constant all throughout
- (d) none of these

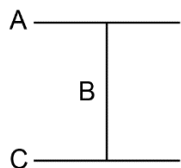
8. A force F acting on an object varies with distance x as shown in figure:



The work done by the force in moving the object from $x=0$ to $x=6$ m

- (a) 18 J (b) 13.5 J (c) 9 J (d) 4.5 J

9. In the diagram shown, all three rods are of equal length ' L ' and equal mass ' M '. The system is rotated such that rod B is the axis. What is the moment of inertia of the system?



- (a) $\frac{ML^2}{6}$ (b) $\frac{4}{3}ML^2$ (c) $\frac{ML^2}{3}$ (d) $\frac{2}{3}ML^2$

10. If suddenly the gravitational force of attraction between earth and a satellite revolving around it becomes zero, then the satellite will

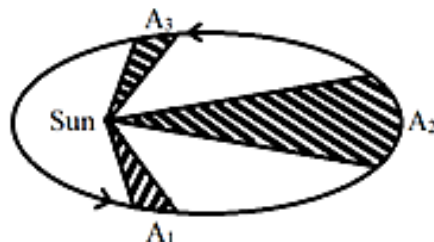
- (a) continue to move in its orbit with same velocity
 (b) move tangential to the original orbit with same velocity
 (c) become stationary in the orbit
 (d) move towards earth

11. A mass ' M ' is suspended from a spring of negligible mass. The spring is pulled a little and then released so that the mass executes S.H.M. of time period ' T '. If the mass is increased by ' m ', then time period becomes ' $5T/3$ '. Then the ratio ' m/M ' is

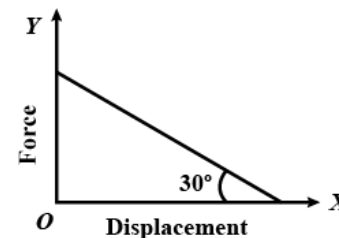
- (a) 3/5 (b) 25/9 (c) 16/9 (d) 5/3

12. A planet moving around sun sweeps area A_1 in 2 days, A_2 in 3 days and A_3 in 6 days. Then relation between A_1 , A_2 and A_3 is

- (a) $3A_1=2A_2=A_3$ (b) $2A_1=3A_2=6A_3$
 (c) $3A_1=2A_2=6A_3$ (d) $6A_1=3A_2=2A_3$



13. The value of force constant between the applied elastic force (F) and the displacement will be



- (a) $\frac{1}{\sqrt{3}}$ (b) $\sqrt{3}$ (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

14. For an ideal gas, the coefficient of volume expansion

- (a) Increases with increase in temperature
 (b) Decreases with increase in temperature
 (c) Remains constant with increase in temperature
 (d) Increases with square of temperature

15. In a simple harmonic oscillator, at the mean position,

- (a) kinetic energy is minimum, potential energy is maximum
 (b) both kinetic and potential energies are maximum
 (c) kinetic energy is maximum, potential energy is minimum
 (d) both kinetic and potential energies are minimum

Two statements are given: one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true and R is the correct explanation of A
 (b) Both A and R are true and R is NOT the correct explanation of A
 (c) A is true but R is false
 (d) A is false and R is also false

16. **Assertion:** Dimensional constants are the quantities whose values are constant.

Reason: Dimensional constants are dimensionless.

17. **Assertion:** Same force applied for the same time causes the same change in momentum for different bodies.

Reason: The total momentum of an isolated system of interacting bodies remains conserved.

18. **Assertion:** The bob of a simple pendulum is a ball full of water. If a fine hole is made in the bottom of the ball, the time period first increases and then decreases.

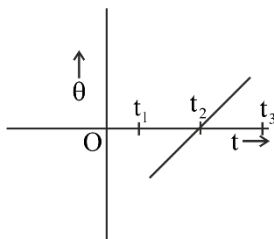
Reason: As the water flows out of the ball, the weight of the bob decreases.

Section – B

19. The displacement x of a particle is dependent on time t according to the relation: $x = 3 - 5t + 2t^2$. If t is measured in seconds and x in metres, find its (i) velocity at $t = 2$ s and (ii) acceleration at $t = 4$ s.

20. A body accelerates from rest uniformly along a straight highway at the rate of 10 ms^{-2} for 5 s, it moves with uniform velocity for 25 s and then retards uniformly and comes to rest in 10 s. Draw the velocity-time graph of the body.

21. The variation of θ of a point on a rotating rigid body, with time 't' is shown in the figure. Is the body rotating clockwise or anti-clockwise? Give reason.



OR

Deduce the relation between torque and angular momentum.

22. A man jumping out of a moving train falls with his head forward. Why?

23. An artificial satellite revolves around the earth at a height of 1000 km. Find its orbital velocity.

OR

Show that the escape velocity of a body from the earth's surface is $\sqrt{2}$ times its velocity in a circular orbit just above the earth's surface.

24. Why are we hurt less when we jump on a muddy floor in comparison to a hard floor?

25. An organ pipe open at both the ends has a length of 0.8 m. What will be the fundamental frequency and second overtone of the pipe if the speed of sound in air is 344 m/s?

Section – C

26. Calculate the moment of inertia of uniform circular disc of mass 500 g, radius 10 cm about (i) diameter of the disc (ii) the axis tangent to the disc and parallel to its diameter and (iii) the axis through the centre of the disc and perpendicular to its plane.

27. Derive an expression for the variation in the value of 'g' with altitude. Also, show the approximate expression if the altitude is much less than the radius of the earth.

28. Determine the speed of a vehicle travelling on a curved road which is banked at an angle θ with the horizontal.

OR

A wooden block of mass 100 kg rests on a flat wooden floor, the coefficient of friction between the two being 0.4. The block is pulled by a rope making an angle 30° with the horizontal. What is the minimum tension along the rope that just makes the block sliding?

29. (i) The length of a metal wire is 'l' when the tension is 'F' and 'xl' when the tension is 'yF'. Then what is the natural length of wire? [2]

ii) There are two wires of the same material and same length. The diameter of the second wire is twice the diameter of the first wire. What will be the ratio of extension produced by applying the same load? [1]

OR

Three bars of equal length and same area of cross-section are connected in series (end to end). The thermal conductivities of these bars are in the ratio 2:4:3. If the open end of the first bar is at a temperature of 180°C and that of the last bar is at a temperature of 10°C , find the temperature of both the junctions. [3]

30. Establish the displacement relation for harmonic wave travelling along the positive direction of X-axis.

Section – D

31. A projectile is fired with a velocity u making an angle θ with the horizontal. Show that its trajectory is a parabola. Hence, derive expressions for (i) time of flight and (ii) maximum height.

OR

What is meant by centripetal acceleration? Derive an expression for the centripetal acceleration of a body moving with uniform speed 'v' along a circular path of radius 'r'. Explain how it acts along the radius towards centre of the circular path.

32. An object of mass m_1 travelling with an initial velocity u_1 collides with an object of mass m_2 (at rest). After the collision, the objects get thrown off in two different directions (at angles θ_1 and θ_2 with respect to the horizontal), now travelling with velocities v_1 and v_2 respectively. Assuming that the collision is elastic and takes place in 2-D, state three equations illustrating the relation between m_1 , m_2 , u_1 , v_1 and v_2 . Hence, show that if $m_1 = m_2 = m$, \vec{v}_1 and \vec{v}_2 are perpendicular to each other.

OR

What is perfectly inelastic collision? When a bullet is fired into a wooden log, it gets embedded in the log and then both move with a common velocity. Find the expression for the loss of kinetic energy in this case. Also, find the ratio of the final kinetic energy of the bullet to its initial kinetic energy. What would be the final kinetic energy of the bullet if the log is assumed to be massive in its comparison?

33. Prove Bernoulli's principle for the flow of non-viscous fluids.

OR

(i) State Stokes' law.

(ii) Deduce Stokes' law on the basis of dimensional considerations.

(iii) Derive an expression for the terminal velocity of a small spherical body falling through a viscous medium. [1+1^{1/2}+2^{1/2}]

Section – E

Read the paragraph given below and answer the questions that follow:

34. A wave or disturbance that moves from one point of the medium to another continuously in the same direction without any change in its amplitude is called a progressive or travelling wave. It may be transverse or longitudinal. If, during the propagation of a wave through a medium, the particles of the medium follow SHM about their mean position, then the wave is called a plane progressive harmonic wave. Here, all the particles have the same amplitude but the phase of oscillation for different particles is different.

The displacement of a progressive wave is represented by the relation: [all quantities are in SI unit]

$$y(x,t) = 80 \sin(40t + 20x + \pi/6)$$

Find its

- (i) time period [1]
- (ii) maximum velocity of the particles of the medium (show differentiation) [2]
- (iii) wavelength [1]

OR

- (iii) wave velocity [1]

35. When some force is applied on a body and the body moves through certain distance in the direction of applied force then work is said to be done. Mathematically, $W = Fs \cos \theta$, whereas the energy is the capacity of doing work. The energy possessed by body by virtue of its motion is kinetic energy. Power is the rate of doing work. Work, energy and power all are scalar quantities. Kinetic energy of a body is the energy possessed by a body by virtue of its motion. Potential energy of a body is the energy possessed by the body by virtue of its position. Energy can neither be created nor be destroyed, however the energy can be changed from one form to the other, such that energy appearing in one form is equal to the energy disappearing in other form.

- (i) A light and heavy body have equal K.E. Which has greater momentum? [1]
- (ii) If the momentum of a body is increased by 0.01%, then what will be the increase in K.E.? [2]
- (iii) A force of 10 N displaces the body by 10 m. If the work done is 50 J, then what is the direction of force makes an angle with the direction of displacement? [1]

OR

- (iii) A particle moves with velocity $\vec{v} = (6\hat{i} - 4\hat{j} + 3\hat{k}) \text{ ms}^{-1}$ under the influence of a constant force $\vec{F} = (20\hat{i} + 15\hat{j} - 5\hat{k}) \text{ N}$. What is the instantaneous power applied to the particle? [1]

General Instructions:

Read the following instructions carefully:

- There are **35** questions in this question paper with internal choice.
- Section A consists of **18** multiple-choice questions carrying 1 mark each.
- Section B consists of **7** very short answer questions carrying 2 marks each.
- Section C consists of **5** short answer questions carrying 3 marks each.
- Section D consists of **2** case-based questions carrying 4 marks each.
- Section E consists of **3** long answer questions carrying 5 marks each.
- All questions are compulsory.**
- Use of log tables and calculators is not allowed.**

Section – A

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

- The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms?
(a) 4 g He (b) 46 g Na (c) 0.40 g Ca (iv) 12 g He
- Number of angular nodes for 4d orbital is _____.
(a) 4 (b) 3 (c) 2 (d) 1
- For the electrons of oxygen atom, which of the following statements is correct?
(a) Z_{eff} for an electron in a 2s orbital is the same as Z_{eff} for an electron in a 2p orbital.
(b) An electron in the 2s orbital has the same energy as an electron in the 2p orbital.
(c) Z_{eff} for an electron in 1s orbital is the same as Z_{eff} for an electron in a 2s orbital.
(d) The two electrons present in the 2s orbital have spin quantum numbers m_s but of opposite sign.
- The pair of ions having same electronic configuration is _____.
(a) Cr^{3+} , Fe^{3+} (b) Fe^{3+} , Mn^{2+} (c) Fe^{3+} , Co^{3+} (d) Sc^{3+} , Cr^{3+}
- The first ionisation enthalpies of Na, Mg, Al and Si are in the order:
(a) $\text{Na} < \text{Mg} > \text{Al} < \text{Si}$ (b) $\text{Na} > \text{Mg} > \text{Al} > \text{Si}$
(c) $\text{Na} < \text{Mg} < \text{Al} < \text{Si}$ (d) $\text{Na} > \text{Mg} > \text{Al} < \text{Si}$

6. Electronic configurations of four elements A, B, C and D are given below:

- (A) $1s^2 2s^2 2p^6$ (B) $1s^2 2s^2 2p^4$ (C) $1s^2 2s^2 2p^6 3s^1$ (D) $1s^2 2s^2 2p^5$

Which of the following is the correct order of increasing tendency to gain electron?

- (a) $A < C < B < D$ (b) $A < B < C < D$
(c) $D < B < C < A$ (d) $D < A < B < C$

7. The types of hybrid orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ , respectively are expected to be

- (a) sp, sp^3 and sp^2 (b) sp, sp^2 and sp^3
(c) sp^2 , sp and sp^3 (d) sp^2 , sp^3 and sp

8. Which molecule/ion out of the following does **NOT** contain unpaired electrons?

- (a) N_2^+ (b) O_2 (c) O_2^{2-} (d) B_2

9. Using the standard electrode potential, find out the pair between which redox reaction is **NOT** feasible.

E° values : $\text{Fe}^{3+}/\text{Fe}^{2+} = +0.77$; $\text{I}_2/\text{I}^- = +0.54$;

$\text{Cu}^{2+}/\text{Cu} = +0.34$; $\text{Ag}^+/\text{Ag} = +0.80$ V

- (a) Fe^{3+} and I^- (b) Ag^+ and Cu
(c) Fe^{3+} and Cu (d) Ag and Fe^{3+}

10. During hearing of a court case, the judge suspected that some changes in the documents had been carried out. He asked the forensic department to check the ink used at two different places. According to you which technique can give the best results?

- (a) Column chromatography (b) Solvent extraction
(c) Thin layer chromatography (d) Distillation

11. Hyperconjugation involves delocalisation of _____.

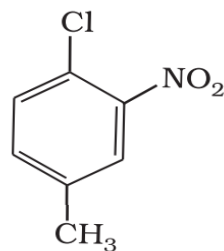
- (A) Electrons of carbon-hydrogen σ bond of an alkyl group directly attached to an atom of unsaturated system.
(B) Electrons of carbon-hydrogen σ bond of alkyl group directly attached to the positively charged carbon atom.
(C) π -Electrons of carbon-carbon bond
(D) Lone pair of electrons

Which one of the following is the correct option?

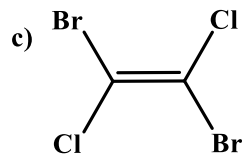
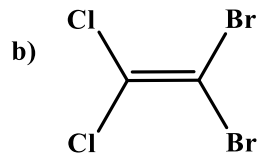
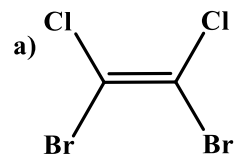
- a) A, B b) C, D c) A, C d) B, D

12. The IUPAC name for

- (a) 1-Chloro-2-nitro-4-methylbenzene
- (b) 1-Chloro-4-methyl-2-nitrobenzene
- (c) 2-Chloro-1-nitro-5-methylbenzene
- (d) m-Nitro-p-chlorotoluene



13. Which of the following will **NOT** show geometrical isomerism?



d) All the above

14. The molecule having non-zero dipole moment is (or are) _____.

- (i) *trans*-But-2-ene
- (ii) *trans*-Hex-2-ene
- (iii) *trans*-Hex-3-ene
- (iv) *cis*-But-2-ene

Which one is correct?

- a) Only (iv)
- b) Both (i) and (iv)
- c) Both (ii) and (iii)
- d) Both (ii) and (iv)

15. Given below are two statements labelled as **Assertion (A)** and **Reason (R)**.

Assertion (A): Generally, ionisation enthalpy increases from left to right in a period.

Reason (R): When successive electrons are added to the orbitals in the same principal quantum level, the shielding effect of inner core of electrons does not increase very much to compensate for the increased attraction of the electron to the nucleus.

Select the most appropriate answer from the options given below:

- (a) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (b) Both **A** and **R** are true but **R** is not the correct explanation of **A**.
- (c) **A** is true but **R** is false.
- (d) **A** is false but **R** is true.

16. Given below are two statements labelled as **Assertion (A)** and **Reason (R)**.

Assertion (A): Spontaneous process is an irreversible process and may be reversed by some external agency.

Reason (R): Decrease in enthalpy is a contributory factor for spontaneity.

Select the most appropriate answer from the options given below:

- (a) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (b) Both **A** and **R** are true but **R** is not the correct explanation of **A**.
- (c) **A** is true but **R** is false.
- (d) **A** is false but **R** is true.

17. Given below are two statements labelled as **Assertion (A)** and **Reason (R)**.

Assertion (A): 2-Methylpropene, upon hydration, produces 2-methylpropan-2-ol, but not 2-methylpropan-1-ol as the major product.

Reason (R) : According Markonikov Principle, the positive addendum of the reagent attaches itself to the carbon bearing less number of hydrogen atoms (of the alkene substrate).

Select the most appropriate answer from the options given below:

- (a) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (b) Both **A** and **R** are true but **R** is not the correct explanation of **A**.
- (c) **A** is true but **R** is false.
- (d) **A** is false but **R** is true.

18. Given below are two statements labelled as **Assertion (A)** and **Reason (R)**.

Assertion (A): In the reaction between potassium permanganate and potassium iodide, permanganate ions act as oxidising agent.

Reason (R): Oxidation state of manganese changes from +2 to +7 during the reaction.

Select the most appropriate answer from the options given below:

- (a) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (b) Both **A** and **R** are true but **R** is not the correct explanation of **A**.
- (c) **A** is true but **R** is false.
- (d) **A** is false but **R** is true.

Section – B

This section contains 7 questions with internal choice in two questions. The following questions are very short answer type and carry 2 marks each.

19. The density of 3 molal solution of NaOH is 1.110 g mL^{-1} . Calculate the molarity of the solution. ($333 \div 112 = 2.973$)

20. According to de Broglie, matter should exhibit dual behaviour that is both particle and wave like properties. However, a cricket ball of mass 100 g does not move like a wave when it is thrown by a bowler at a speed of 100 km/h. Calculate the wavelength of the ball and explain why it does not show wave nature.

($250 \div 9 = 27.78$; $6.626 \div 2.778 = 2.385$)

OR

Out of electron and proton which one will have, a higher velocity to produce matter waves of the same wavelength? Explain it.

21. Table-tennis ball has a mass 10 g and a speed of 90 m/s. If speed can be measured within an accuracy of 4% what will be the uncertainty in speed and position? ($4 \times 3.14 \times 0.01 \times 3.6 = 0.45216$; $6.626 \div 0.45216 = 14.6544$)

OR

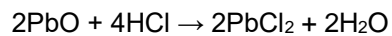
Threshold frequency, ν_0 is the minimum frequency which a photon must possess to eject an electron from a metal. It is different for different metals. When a photon of frequency $1.0 \times 10^{15} \text{ s}^{-1}$ was allowed to hit a metal surface, an electron having $1.988 \times 10^{-19} \text{ J}$ of kinetic energy was emitted. Calculate the threshold frequency of this metal.

($1.988 \div 6.626 = 0.3$)

22. Chlorophyll present in green leaves of plants absorbs light at $4.620 \times 10^{14} \text{ Hz}$. Calculate the wavelength of radiation in nanometer. Which part of the electromagnetic spectrum does it belong to? ($3 \div 4.62 = 0.6494$)

23. Draw the resonating structure of (i) Ozone molecule (ii) Nitrate ion

24. PbO and PbO₂ react with HCl according to following chemical equations:



Why do these compounds differ in their reactivity?

25. i) Draw Sawhorse projections for the eclipsed and staggered conformations of ethane. [$\frac{1}{2} \times 2 = 1$]

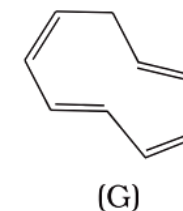
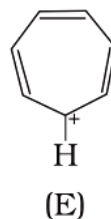
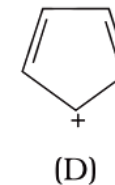
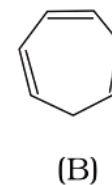
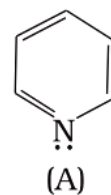
ii) The ring systems having following characteristics are aromatic.

(a) Planar ring containing conjugated π bonds.

(b) Complete delocalisation of the π -electrons in ring system i.e. each atom in the ring has unhybridised p-orbital, and

(c) Presence of $(4n+2)$ π -electrons in the ring where n is an integer ($n = 0, 1, 2, \dots$) [Huckel rule].

Using this information classify the following compounds as aromatic/ nonaromatic (any two). [$\frac{1}{2} \times 2 = 1$]



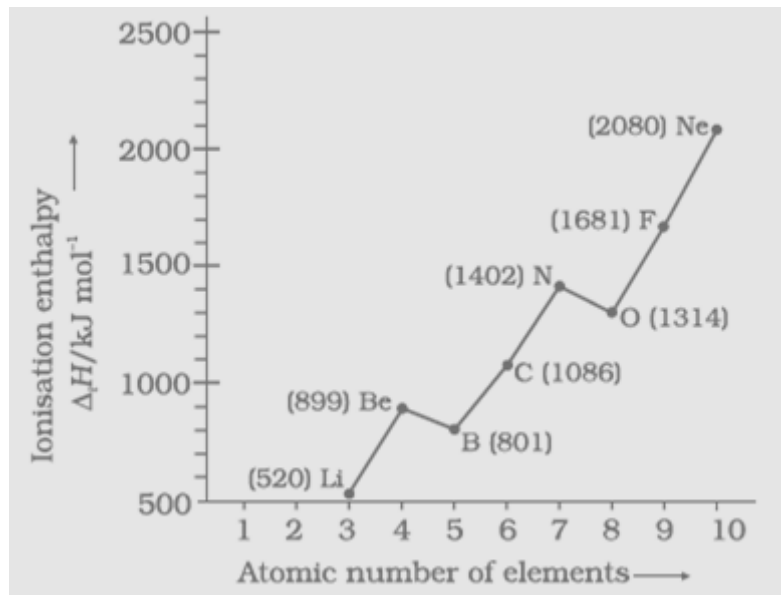
Section – C

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

26. i) The enthalpy of vaporisation of CCl₄ is 30.5 kJ mol^{-1} . Calculate the heat required for the vaporisation of 284 g of CCl₄ at constant pressure. (Molar mass of CCl₄ = 154 g mol^{-1} ; $284 \div 154 = 1.844$)

ii) Heat has randomising influence on a system and temperature is the measure of average chaotic motion of particles in the system. Write the mathematical relation which relates these three parameters. [$2+1=3$]

27. Explain the deviation in ionisation enthalpy of some elements from the general trend by using the given graph.



28. Write Lewis structure of the following compounds and show formal charge on each atom:



29. Calculate the minimum volume of water required to dissolve 0.1 g lead (II) chloride to get a saturated solution. (K_{sp} of PbCl₂ = 3.2×10^{-8} , atomic mass of Pb = 207 u; $0.1 \div 0.556 = 0.1798$)

OR

Calculate the pH of a solution formed by mixing equal volumes of two solutions **A** and **B** of a strong acid having pH = 6 and pH = 4 respectively [$\log_{10}(5.05) = 0.703$].

30. i) Which of the two structures **(A)** and **(B)** given below is more stabilised by resonance? Explain.



(A)

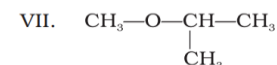
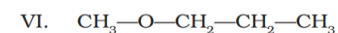
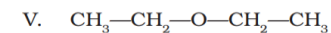
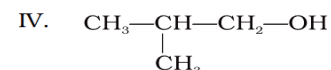
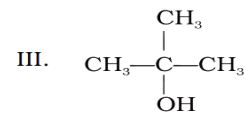
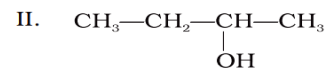
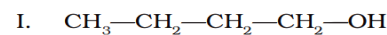


(B)

ii) What is the hybridisation of each carbon in H₂C = C = CH₂. [2+1=3]

OR

i) Consider structures I to VII and answer the questions: [$\frac{1}{2} \times 4 = 2$]



a) Which of the above compounds form pairs of metamers (any one pair)?

b) Identify one pair of compounds which are functional group isomers.

c) Identify one pair of compounds that represents position isomerism.

d) Identify one pair of compounds that represents chain isomerism.

ii) Explain, how is the electronegativity of carbon atoms related to their state of hybridisation in an organic compound? [1]

Section – D

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

31. The identity of a substance is defined not only by the types of atoms or ions it contains, but by the quantity of each type of atom or ion. The experimental approach required the introduction of a new unit for amount of substances, the mole, which remains indispensable in modern chemical science. The mole is an amount unit similar to familiar units like pair, dozen, gross, etc. It provides a specific measure of the number of atoms or molecules in a bulk sample of matter. A mole is defined as the amount of substance containing the same number of discrete entities (atoms, molecules, ions, etc.) as the number of atoms in a sample of pure ¹²C weighing exactly 12 g. One Latin connotation for the word “mole” is “large mass” or “bulk,” which is consistent with its use as the name for this unit. The mole provides a link between an easily measured macroscopic property, bulk mass, and an extremely important fundamental property, number of atoms, molecules and so forth. The

number of entities composing a mole has been experimentally determined to be $6.02214179 \times 10^{23}$.

$6.02214179 \times 10^{23}$, a fundamental constant named Avogadro's number (N_A) or the Avogadro constant in honor of Italian scientist Amedeo Avogadro. This constant is properly reported with an explicit unit of "per mole," a conveniently rounded version being $6.022 \times 10^{23}/\text{mol}$. Consistent with its definition as an amount unit, 1 mole of any element contains the same number of atoms as 1 mole of any other element. The masses of 1 mole of different elements, however, are different, since the masses of the individual atoms are drastically different. The molar mass of an element (or compound) is the mass in grams of 1 mole of that substance, a property expressed in units of grams per mole (g/mol).

- What is the reciprocal of Avogadro's number called? What is its value?
- Calculate the number of atoms present in 11.2 L of O_2 at N.T.P.?
- How many atoms and molecules of phosphorous are present in 0.5 mole of P_4 molecules?

OR

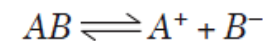
A sample of copper sulphate pentahydrate contains 8.64 g of oxygen. How many grams of Cu are present in the sample? $(63.5 \times 8.64) \div 144 = 3.81$ [1+1+2=4]

32. Reactants and products coexist at equilibrium, so that the conversion of reactant to products is always less than 100%. Equilibrium reaction may involve the decomposition of a covalent (nonpolar) reactant or ionization of ionic compound into their ions in polar solvents. Ostwald dilution law is the application of the law of mass action to the weak electrolytes in solution. It states that "the degree of dissociation of a weak electrolyte is inversely proportional to the square root of molar concentration or directly proportional to the square root of volume holding one mole of the solute for a weak electrolyte." Ostwald used the law of mass action in ionic equilibrium, which is analogous to chemical equilibrium because ions are in equilibrium. He devised an equation for the fluctuation of an electrolyte's degree of ionisation with dilution, which is known as Ostwald's dilution law.

Ostwald's dilution law relates the dissociation constant of the weak electrolyte with the degree of dissociation and the concentration of the weak electrolyte. This law

tells us that the equilibrium constant and the initial concentration of an electrolyte (prior to dissociation or association) can be used to calculate the extent of this dissociation or association for the electrolyte.

A binary electrolyte AB which dissociates into A^+ and B^- ions i.e.



for every weak electrolyte, Since $\alpha \ll 1$ $(1 - \alpha) = 1$

$$K = C \alpha^2 \Rightarrow \alpha = \sqrt{\frac{K}{C}} \Rightarrow \alpha = \sqrt{KV}.$$

- If α is the fraction of HI dissociated at equilibrium in the reaction: $2HI \rightleftharpoons H_2 + I_2$, what will be the total number of moles of reactants and products will remain at equilibrium if the experiment is started with 2 mol of HI? Give reasons.
- In the base-catalysed hydrolysis of oil, the sodium salt of the fatty acid (soap) remains in a dissolved state.



In the next step, sodium chloride is added to mixture to get the soap. Why is it needed to add the salt? Give reasons.

- What is the the hydrogen ion concentration of a 10^{-8} (M) HCl aqueous solution at 298 K ($K_w = 10^{-14}$) ?

OR

A monobasic weak acid solution has a molarity of 0.005 M and pH of 5. What is its percentage ionization in this solution? [1+1+2=4]

Section – E

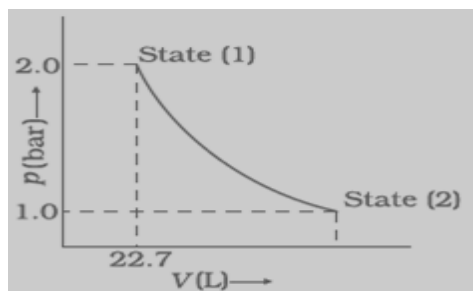
The following questions are long answer type and carry 5 marks each. Two questions have an internal choice.

33.i) Expansion of a gas in vacuum is called free expansion. Calculate the work done and the change in internal energy when 1 litre of ideal gas expands isothermally into vacuum until its total volume is 5 litre?

ii) 1.0 mol of a monoatomic ideal gas is expanded from state (1) to state (2) as shown in the given graph. Calculate the work done for the expansion of gas from state (1) to state (2) at 298 K.

$$(\log_{10}2=0.301; 2.303 \times 8.314 \times 298 \times 0.3010 = 1717.46)$$

[2+3=5]

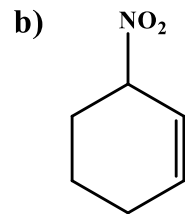
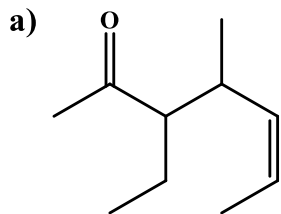


OR

i) 18.0 g of water completely vaporises at 100°C and 1 bar pressure and the enthalpy change in the process is 40.79 kJ mol⁻¹. What will be the enthalpy change for vaporising two moles of water under the same conditions? What is the standard enthalpy of vaporisation for water?

ii) The standard molar entropy of H₂O (l) is 70 J K⁻¹ mol⁻¹. Will the standard molar entropy of H₂O(s) be more, or less than 70 J K⁻¹ mol⁻¹? Explain. [3+2=5]

34. i) Name the compounds whose line formulae are given below :



[1+1=2]

ii) Write structural formulae for compounds named as-

(a) 1-Bromoheptane (b) 5-Bromoheptanoic acid [1+1=2]

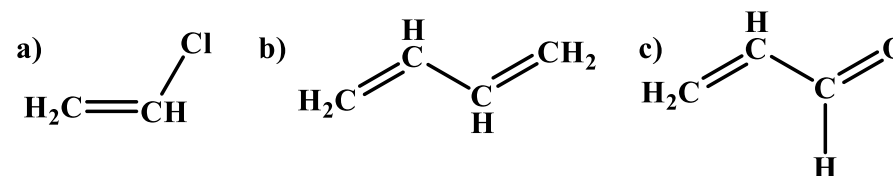
iii) For testing halogens in an organic compound with AgNO₃ solution, sodium extract (Lassaigne's test) is acidified with dilute HNO₃. What will happen if a student acidifies the extract with dilute H₂SO₄ in place of dilute HNO₃? [1]

OR

i) Three students, Manish, Ramesh and Rajni were determining the extra elements present in an organic compound given by their teacher. They prepared the Lassaigne's extract (L.E.) independently by the fusion of the compound with sodium metal. Then they added solid FeSO₄ and dilute

sulphuric acid to a part of Lassaigne's extract. Manish and Rajni obtained prussian blue colour but Ramesh got red colour. Ramesh repeated the test with the same Lassaigne's extract, but again got red colour only. They were surprised and went to their teacher and told him about their observation. Teacher asked them to think over the reason for this. Can you help them by giving the reason for this observation. Also, write the chemical equations to explain the formation of compounds of different colours. [3]

ii) Draw the resonance structures of the following compounds: [1.5]

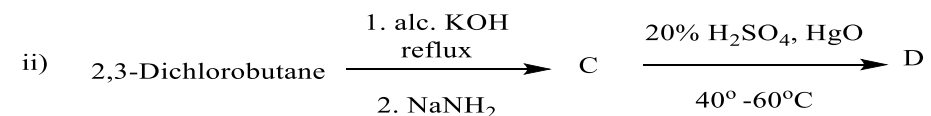
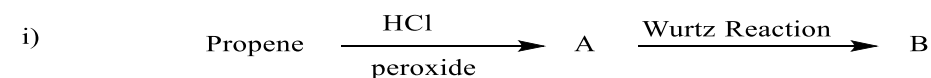


iii) By mistake, an alcohol (boiling point 97°C) was mixed with a hydrocarbon (boiling point 68°C). Suggest a suitable method to separate the two compounds. [0.5]

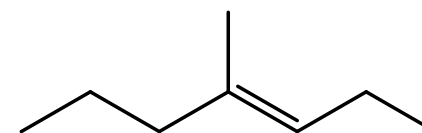
35. i) How will you carry out the following transformations? Show the reaction steps schematically (any two). [1+1=2]

a) Ethanoic acid to butane
b) Hex-1-yne to hexachlorobenzene
c) Ethene to acetophenone
d) Propene to sodium propynide

ii) Write down the structures of the major products (any one) [1+1=2]



iii) Write down the structure(s) of the ozonolysis product(s) obtained from the following compound: [1]



General Instructions:

- There are a total of 33 questions and five sections in the question paper. All questions are compulsory.
- Section A** contains question numbers 1 to 16, multiple choice questions of ONE mark each. **Section B** contains question numbers 17 to 21, short answer type questions of TWO marks each. **Section C** contains question numbers 22 to 28, short answer type II questions of THREE marks each. **Section D** contains question number 29 to 30, case-based short answer type question of FOUR marks. **Section E** contains question numbers 31 to 33 long answer type question of FIVE marks.
- There is no overall choice in the question paper. However, internal choices are provided in some questions. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.

SECTION A (1x16)

- All living organisms are linked to one another because
 - They have common genetic material of the same type
 - They share common genetic material but to varying degrees
 - All have common cellular organization
 - All of above
- Contagium vivum fluidum was proposed by
 - D.J. Ivanowsky
 - M.W. Beijerinck
 - Stanley
 - Robert Hook
- A plant shows thallus level of organization. It shows rhizoids and is haploid. It needs water to complete its life cycle because the male gametes are motile. Identify the group to which it belongs to
 - Pteridophytes
 - Gymnosperms
 - Monocots
 - Bryophytes
- Which one of the following sets of animals belong to a single taxonomic group?
 - Cuttlefish, Jellyfish, Silverfish, Dogfish, Starfish
 - Bat, Pigeon, Butterfly
 - Monkey, Chimpanzee, Man
 - Silkworm, Tapeworm, Earthworm
- Which one of the following statements is incorrect?
 - Mesoglea is present in between ectoderm and endoderm in *Obelia*.
 - Exhibits radial symmetry *Asterias*

- Fasciola* is a pseudocoelomate animal
 - Taenia* is a triploblastic animal
- Roots developed from parts of the plant other than radicle are called
 - Taproots
 - Fibrous roots
 - Adventitious roots
 - Nodular roots
 - Bidder's canal in frog is found in?
 - Kidney
 - Urinary bladder
 - Testes
 - Cloaca
 - An aminoacid under certain conditions have both positive and negative charges simultaneously in the same molecule. Such a form of aminoacid is called
 - Acidic form
 - Basic form
 - Aromatic form
 - Zwitterionic form
 - Which of the following is not a function of cytoskeleton in a cell?
 - Intracellular transport
 - Maintenance of cell shape and structure
 - Support of the organelle
 - Cell motility
 - Which pigment acts directly to convert light energy to chemical energy?
 - Chlorophyll a
 - Chlorophyll b
 - Xanthophyll
 - Carotenoid
 - Which range of wavelength (in nm) is called photosynthetically active radiation (PAR)?
 - 100 – 390
 - 390 – 430
 - 400 – 700
 - 760 – 100,00
 - Match the following and choose the correct option from those given below.

Column I

- Molecular oxygen
- Electron acceptor
- Pyruvate dehydrogenase
- Decarboxylation

Column II

- α - Ketoglutaric acid
- hydrogen acceptor
- cytochrome C
- acetyl Co A

Options

- A-ii, B-iii, C-iv, D-i
- A-iii, B-iv, C-ii, D-i
- A-ii, B-i, C-iii, D-iv
- A-iv, B-iii, C-i, D-ii

- ATPase of the muscle is located in
 - Actinin
 - Troponin
 - Myosin
 - Actin
- Which of the following is removed from our body by lungs?
 - CO₂ only
 - H₂O only
 - CO₂ and H₂O
 - Ammonia

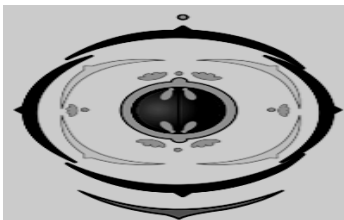
15. Mark the true statement among the following with reference to normal breathing
- Inspiration is a passive process where as expiration is active
 - Inspiration is a active process where as expiration is passive
 - Inspiration and expiration are active processes
 - Inspiration and expiration are passive processes
16. It is known that exposure to carbon monoxide is harmful to animals because
- It reduces CO₂ transport
 - It reduces O₂ transport
 - It increases CO₂ transport
 - It increases O₂ transport

SECTION B (2x5)

17. There is a myth that immediately after heavy rains in forest, mushrooms appear in large number and make a very large ring or circle, which may be several metres in diameter. These are called as 'Fairy rings'. Can you explain this myth of fairy rings in biological terms?
18. How can you differentiate between free central and axile placentation?
19. What does 'S' refer in a 70S & an 80S ribosome?
20. In what kind of plants do you come across 'Kranz' anatomy? To which conditions are those plants better adapted? How are these plants better adapted than the plants which lack this anatomy?
21. Differentiate between diabetes insipidus and diabetes mellitus.

SECTION C (3x7)

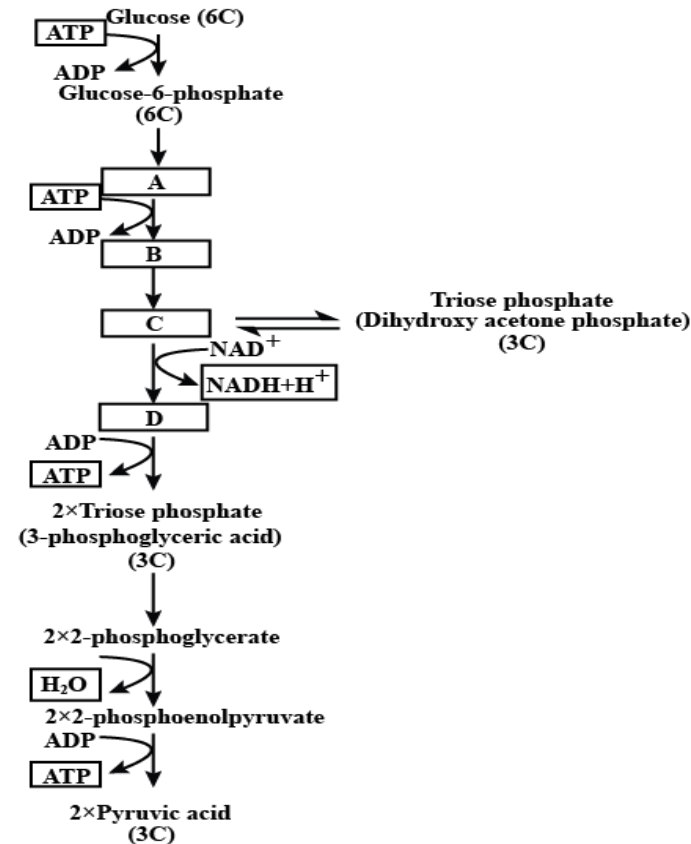
22. Differentiate between:
- Open circulatory system and closed circulatory system
 - Oviparous and viviparous characteristic
 - Direct development and Indirect development
23. Draw a neat and well labelled diagram of male reproductive system of a frog.
- 24.



Write the Floral formula and characteristic features from the given Floral diagram.

Family: Brassicaceae (Mustard family)

25. Nucleic acids exhibit secondary structure. Describe through Watson Crick Model.
OR, Formation of enzyme-substrate complex (ES) is the first step in catalysed reactions. Describe the other steps till the formation of product.
26. Justify the statement, "Mitochondria are power houses of the cell".
27. The figure given below shows the steps in glycolysis. Fill in the missing steps A, B, C, D and also indicate whether ATP is being used up or released at step E?



28. How does a muscle shorten during its contraction and return to its original form during relaxation?

SECTION D (4x2)

29. It has been observed that some plants require a periodic exposure to light to induce flowering. It is also seen that such plants are able to measure the duration of exposure to light. For example, some plants require the exposure to light for a period exceeding a well-defined critical duration, while others must be exposed to light for a period less than this critical duration before the flowering is initiated in them. The former group of plants are called long day plants while the latter ones are termed short day plants. The critical duration is different for different plants. There are many plants, however, where there is no such correlation between exposure to light duration and induction of flowering response; such plants are called day-neutral plants. It is now also known that not only the duration of light period but that the duration of dark period is also of equal importance. Hence, it can be said that flowering in certain plants depends not only on a combination of light and dark exposures but also their relative durations. This response of plants to periods of day/night is termed photoperiodism. It is also interesting to note that while shoot apices modify themselves into flowering apices prior to flowering, they (i.e., shoot apices of plants) by themselves cannot perceive photoperiods. The site of perception of light/dark duration is the leaves. It has been hypothesised that there is a hormonal substance(s) that is responsible for flowering. This hormonal substance migrates from leaves to shoot apices for inducing flowering only when the plants are exposed to the necessary inductive photoperiod.

- What are the plants that requires exposure to light for a period of less than critical duration called?
- Define photoperiodism.
- Define Day-neutral plants with suitable example.

OR, How photoperiod correlate with hormonal substances. [1+1+2]

30. Unlike A-fib which leads to a fast, chaotic heart rhythm and poor movement of blood from your atria to your lower chambers (ventricles), Ventricular fibrillation (may also be called VFib, V-fib or VF) is a type of irregular heart rhythm (arrhythmia) during which, the lower heart chambers contract in a very rapid and uncoordinated manner. As a result, the heart doesn't pump blood to the rest of the body.

Collapse and loss of consciousness are the most common symptoms of ventricular fibrillation.

Before a ventricular fibrillation episode, one may have symptoms of an irregularly fast or erratic heartbeat (arrhythmia). Also, Chest pain, Very fast heartbeat (tachycardia), Dizziness, Nausea, Shortness of breath.

Ventricular fibrillation is an emergency that requires immediate medical attention. It's the most frequent cause of sudden cardiac death. Emergency treatment for ventricular fibrillation includes cardiopulmonary resuscitation (CPR) and shocks to the heart with a device called an automated external defibrillator (AED). Medications, implanted devices or surgery may be recommended to prevent episodes of ventricular fibrillation.

- What is the normal beating rate of a healthy adult heart?
- Why heart is called myogenic?
- Draw comparative diagrams of a normal and V-fib ECG as per your understanding OR, Differentiate between A-fib and V-fib. [1+1+2]

SECTION E (5x3)

31. Why are bryophytes called the amphibians of the plant kingdom? How are the male and female gametophytes of pteridophytes and gymnosperms different from each other?

OR, Give three major differences between chordates and non-chordates. What is the relationship between germinal layers and the formation of body cavity in case of coelomate, acoelomates and pseudocoelomates?

32. What are the various stages of meiotic prophase-I? Enumerate the chromosomal events during each stage?

OR, Explain with suitable diagram

(a) Synaptonemal complex, (b) crossing over, (c) Quiscent stage

33. Write a brief account on Regulation of kidney function.

OR, Write a note using necessary diagram the process of transmission of signal across a neuron.

General Instructions:

- [1] 15 minute prior reading time allotted for Q-paper reading.
- [2] The question paper consists of 5 sections and 38 Questions.
- [3] Section A consists of question 1-18 carrying 1 mark each and is multiple choice questions. All questions are compulsory.
- [4] Sections B consist of questions 19-24 carrying 2 marks each and are very short answer types and should not exceed 60-90 words. Attempt any 5.
- [5] Sections C consist of Question 25-30 carrying 3 marks each and are short answer types and should not exceed 100-150 words. Attempt any 5.
- [6] Sections D consist of Question 31-34 carrying 3 marks each and are case studies.
- [7] Section E consists of Question 35-38 carrying 5 marks each and are short answer types and should not exceed 200-300 words. Attempt any 3.

(SECTION –A)

[1x18]

[Q.1] Which part of the human respiratory system is also known as the 'Windpipe'?

- a) Trachea
- b) Larynx
- c) Bronchi
- d) Pharynx

[Q.2] Which of these health related fitness components can be defined as the proportion of fat and fat free mass in the body?

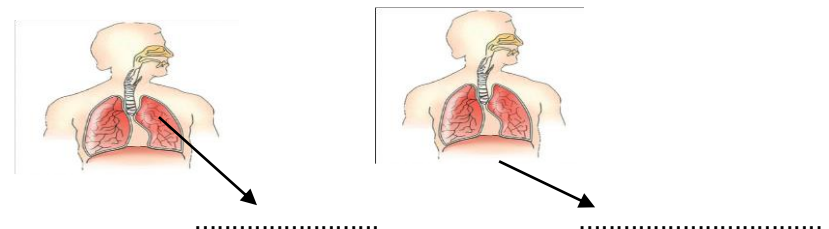
- a) Flexibility
- b) Muscular strength
- c) Body Composition
- d) Cardiorespiratory endurance.

[Q.3] Identify the name of the test given in the picture.



- a) Cardiovascular test
- b) Achievement test
- c) Physical fitness test
- d) Motor ability test

[Q.4] Identify the following parts of the respiratory system:



[Q.5] What type of prohibited substance are illegally used by some athletes to remove excess water from the body?

- a) Cannabinoids
- b) Diuretics
- c) Stimulants
- d) Anabolic Steroids

[Q.6] Which of these joints of the human body is an example of a hinge joint?

- a) Wrist joint
- b) Hip joint
- c) Thumb joint
- d) Knee joint

Q.7] Endurance is the ability of the person to do...

- [a] Activity with high speed.
- [b] Powerful activity
- [c] Work for long duration.
- [d] All of the above.

[Q.8] Which of the following country crowned first-ever ICC Under-19 Women's T20 World champions and where it was held?

- a) India and Hosted by South Africa
- b) India and Hosted Malaysia and Thailand
- c) Australia and Hosted by India
- d) Sri Lanka and Hosted by Bangladesh and Nepal

[Q.9] How much annual scholarship shall each selected athlete receive under the Khelo-India Scheme for eight consecutive years?

- a) 2 Lakhs
- b) 3 lakhs
- c) 5 Lakhs
- d) 8 Lakhs

[Q.10] On which date is the International Yoga Day celebrated every year?

- a) 15 August
- b) 8 January
- c) 21 June
- d) 21 July

Q.11] Full form of WADA is...

- a) World Anti Doping association
- b) World Anti Doping agency
- c) World Anti Disease Association
- d) World Aerobic Dance Association

Q.12] Evaluation help in.....

- a) Determining the result
- b) Conclude the test
- c)Judgement
- d)Allof above.

[Q.13] Match the Following.

List I – Fitness Component

- (I) Cardiorespiratory Endurance
- (II) Muscular Strength
- (III) Muscular Endurance
- (IV) Flexibility

List II – Measurement Test

- (1) Weightlifting
- (2) Sit and Reach test
- (3) Running on Treadmill
- (4) VO2 Max test

- a) I-3,II-1,III-4,IV-2
- b) I-2,II-3, III-1,IV-4
- c) I-1,II-2, III-3,IV-4
- d) I-4,II-2,III-3,IV-1

[Q.14] List I – Types of Bones

- (I) Long Bone
- (II) Flat Bone
- (III) Sesamoid Bone
- (IV) Short Bone

- a) I-3,II-2,III-4,IV-1
- b) I-2,II-3, III-1,IV-4
- c) I-1,II-2, III-3,IV-4
- d) I-4,II-2,III-3,IV-1

List II – Name

- [1] Tarsal
- [2] Sternum
- [3] Femur
- [4] Patella

[Q.15] Given below are the two statements labelled Assertion (A) and Reason (R).

Assertion: Physical education is recognised as an indispensable portion of the school curriculum because of its many faceted benefits.

Reason: It helps students attain physical, emotional, mental and social prowess.

In the context of the two statements given above, which one of the following is correct?

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

[Q.16] This person in school provides treatment, support and care for children who have difficulties in communication.

- [a] occupational therapist
- [b] Physical Education teacher
- [c] Physiotherapist
- [d] Counsellor.

[Q.17] Asanas refers to..... while Pranayama refers to.....

- a) physical exercises; breathing exercises and control of breath
- b) body postures; breathing exercises and control of prana (internal energy)
- c) body movements; mind exercises and control of brain
- d) control of the senses; union with the divine

Q.18 Which colour is contain in the Olympic Symbol?

- a) Blue, Red, Green, Yellow, Black
- b) Black, Green, Red, Blue, Violet
- c) Yellow, blue, Violet, Red, Pink
- d) None of the above.

(SECTION-B)

[Q.19] Why is Physical Education important for youth? Give any two reasons. [2]

[Q.20] What are the full form of IOC, IFS, IOA & NOC. [0.5x4]

[Q.21]Mention the steps of Vrikshasana. [2]

[Q.22] How does the blood Circulation in the Heart? [3]

[Q.23] What are the purpose and side effects of Anabolic Steroids and Beta 2 Agonists. [1+1=2]

[Q.24] What are the disadvantage of Doping. [0.5x4]

(SECTION-C)

- [Q.25] Describe the meaning of Doping. Explain the Physical methods of Doping. (1+2=3)
- [Q.26] What are the components of wellness? Discuss in details. (0.5x6=3)
- [Q.27] What are bones joined by? What are the types of Joints. (1+2=3)
- [Q.28] What are the Importance of Test, Measurement and Evaluation. (0.5x6=3)
- [Q.29] Write short notes on Six Yogic Kriyas. (0.5x6=3)
- [Q.30] Which blood vessel carries deoxygenated blood from right ventricle of the heart to the lungs? Why is it better to breathe through the nose than through the mouth? (1+2=3)

(SECTION-D)

[Q.31] A school did not have sports periods as part of its curriculum. On the basis of the case given, answer the following questions: [1x3=3]

1. Which of the following skills will most likely be missing in the students of such a school?
- (a) Team work and cooperation (b) Public speaking skills
(c) Listening skills (d) None of these
2. If the school creates a sports department in future, what sort of employees will it require?
- (a) Sports doctor (b) Coach
(c) Sports author (d) Both (a) and (b)
3. Which of the following is not an objective of physical education?
- (a) Mental development (b) Economic development
(c) Social development (d) Neuromuscular development

Q.32] In a class of 50 students, a teacher was taking a lesson on components of wellness. The students were later assessed on what they had learnt.

On the basis of the case given, answer the following questions: [1x3=3]

1. What will happen if a person does not pay attention to social wellness?
- (a) It will result in consuming excess unhealthy food items.
(b) It will result inability to build lasting friendships.
(c) It will result in anxiety, depression, frustration.
(d) All of these
2. How can financial wellness be achieved?
- (a) By developing money management goals (b) By spending after saving
(c) Focusing on the principle of 'waste not, want not' (d) All of these
3. If a person responds intelligently to circumstances and is receptive to new ideas and challenges, which of the following components of wellness justify her/his qualities?
- (a) Emotional wellness (b) Intellectual wellness
(c) Environmental wellness (d) Spiritual wellness

[Q.33] A boxer suffers from severe muscle cramps and has a history of injuring himself during or after most matches. [1x3=3]

On the basis of the case given, answer the following questions:

1. How do you think muscle cramps can be avoided?
- (a) Gradual slowing down of the activity (b) Performing proper warm-up
(c) Proper hydration (d) All of these
2. Which of the following is an important safety equipment for a boxer?
- (a) Shoes (b) Boxing vest
(c) Glasses (d) Mouth guard
3. Which of the following is a pre-activity safety measure that the boxer must undertake?
- (a) Perform general warm-up (b) Perform specific warm-up
(c) Both (a) and (b) (d) Gradually slow down the activity

[Q.34] An expert has been called to demonstrate different yogic kriyas in a school campus and also train the students. [1x3=3]

On the basis of the case given, answer the following questions:

1. Which of the following kriyas will be taught to children for training the eyes and mind?
- (a) Kapalbhati (b) Trataka
(c) Vasti (d) Dhauti
2. The expert tells the students to perform nauli regularly. What are the benefits of nauli?
- (a) Removes toxins from the body (b) Enhances the power to focus
(c) Cleanses the rectum (d) Strengthens liver
3. Which of the kriyas will help in cases of sinusitis?
- (a) Trataka (b) Neti
(c) Dhauti (d) Vasti

(SECTION-E)

[Q.35] What are the functions and Structure of Respiratory System with diagram? [2+2+1=5]

[Q.36] Explain the meaning of Sport Training and its Principles in sport Training. [1+4=5]

[Q.37] Define Anatomy and Physiology? Write three importance of Anatomy and Physiology in Physical Education and Sports? [2+3=5]

[Q.38] What is the aim of Physical Education. What are the features of Khelo india Programme? [1+4=5]

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1] is used for carrying out transactions in which money is passed from hand to hand in ancient times. [1]

- (a) Cheques (b) Bill of exchange
(c) Hundi (d) Demand draft

2] E-business is defined as the conduct of industry, trade and commerce using the_____ : [1]

- a) Internet b) Social Network
c) Society d) All of the above

3] In a cooperative society, which of the following principle is followed? [1]

- (a) One share one vote (b) One man one vote
(c) No vote (d) Multiple votes

4] Which of the following is not applicable in life insurance contract? [1]

- (a) Conditional contract (b) Unilateral contract
(c) Indemnity contract (d) None of the above

5] Funds required for purchasing current assets is an example of [1]

- (a) Fixed capital requirement (b) Ploughing back of profits
(c) Working capital requirement (d) Lease financing

6] Industries like sugar mill or oil refinery are put under which category? [1]

- (a) Primary (b) Secondary (c) Tertiary (d) None of these

7] Wholesalers act as a link between_____and_____ [1]

- (a) Manufacturer and customer (b) Retailer and customer
(c) User and manufacturer (d) Manufacturer and retailer

8] International business involves the movement of_____from one nation to another [1]

- (a) Goods and services (b) Trademarks (c) Know-how (d) All of these

9] Mr Kabir Khan desires to have two benefits from his bank account, first, to earn higher interest on balance and second, to face minimum risk of dishonouring a cheque. Which type of account should be opened by him in Indus Bank? [1]

- (a) Current account (b) Saving account
(c) Multiple option account (d) Recurring account

10] Among business, trade and commerce which of these is considered as a wider term: [1]

- a) Commerce b) Business
c) Trade d) All are considered as the same

11] Services are intangible means that: [1]

- (a) Services have to be performed differently according to the demand of the customers
(b) The production and consumption of services cannot be separated
(c) Services cannot be stored for future use
(d) Services cannot be touched or seen

12] In a B2C business transaction which parties are involved: [1]

- a) Only business firms b) Only customers
c) Both business and customer d) Third party and customer

13] Assertion (A): Speculative risks involve both the possibility of gain, as well as, the possibility of loss.

Reason (R): Speculative risks arise due to changes in market conditions, including fluctuations in demand and supply. [1]

- (a) Both the Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
(b) Both the Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)
(c) Assertion (A) is true, but Reason (R) is false
(d) Assertion (A) is false, but Reason (R) is true

14] If the investment in an MSME manufacturing goods is Rs 1 crore and turnover is less than 5 crores then it is a: [1]

- (a) Microenterprise (b) Small enterprise
(c) Medium enterprise (d) Large enterprise

15] The company form of organisation is governed by The Companies Act,..... [1]

- (a) 1912 (b) 2013 (c) 1932 (d) 1965

16] The term 'redeemable' is used for [1]

- (a) Preference shares (b) Commercial paper
(c) Equity shares (d) Public deposits

17] Public sector organisations may either be partly or wholly owned by the government. [1]

- (a) State (b) Central (c) Foreign (d) Central or state

18] Social responsibility of a business is _____ what is written in the law: [1]

- a) Restricted to b) Not more than c) More than d) Equal to

19] form of PSU has the greatest autonomy. [1]

- (a) Departmental undertakings (b) Public corporation
(c) Government company (d) None of the above

20] Retailers help in promotion of sale of products, is this a service rendered by retailers to manufacturers: [1]

- (a) True (b) partially true (c) False (d) None of the above

21] Rajveer took an insurance policy for his new car. In an accident his car is totally damaged. Insurance company settles his claim in time. Identify the party which will have a right to claim the amount realised through the sale of scrap of the car. Explain the principle. [3]

22] "The path of small scale industries is full of hurdles". Discuss. [3]

23] The Reserve Bank of India (RBI) was established under a Special Act of the Parliament that lays down the objects, powers and functions of the corporation. It was established on 1st April, 1935 in accordance with the provisions of the Reserve Bank of India Act, 1934. RBI formulates, implements and monitors the monetary policy and its main objective is to maintain price stability while keeping in mind the objective of growth. How will you classify the Reserve Bank of India as a form of public sector enterprise? Write any two features of the concerned public sector enterprise. [3]

24] Vishal Mega Mart is India's largest Fashion-led hypermarket chain with a footprint of over 204 stores, cumulative trading area in excess of 3 million square feet, in over 110 cities and towns across India. Vishal is sharply focused at the needs of consumers in Apparel, General Merchandise Grocery and Personal Care in Tier-1, Tier 2 and Tier-3 cities and towns and is dedicated to offer the best value and choice to its millions of customers. Vishal offers clearly differentiated value to customers in the following product categories for which it has following departments
(a) Fashion: Fresh, trendy and affordable fashion comprising latest Apparel, Footwear & Lifestyle accessories collection across Men's, Women's & Kid's
(b) General Merchandise: Catering to all the household needs such as Kitchenware, Home Furnishings, Luggage & Travel Accessories, Home/Kitchen Appliances, Toys & Sports etc. at best prices.

c) Grocery and Household Needs: Catering to all daily needs with an extensive Grocery & Staples, Packed Food, Branded Personal Care and Household Needs products.

a] Which type of large scale retail trade is being referred to here?

b] How many departments are there?

c] Mention two merits of the type of large scale retail trade identified in part (a) [3]

OR

What difficulties would a manufacturer face if the wholesalers are eliminated from a locality? [3]

25] "It has a wide reach as on one hand it allows the seller and access to the global market and on the other hand, it offers to the buyer, freedom to choose, products from almost any part of the world." Which benefits of e-business is described in above lines? Quote lines [4]

OR

What are the responsibilities of business towards the suppliers and employees? [4]

26] Lalaji, a local vegetable trader, took first mover advantage to sell his vegetables and groceries online. He decided to raise funds from friends and relatives to grow his business and launched a company Locallala.com. In the first year, the business did well. The industry was flooded with new entrants like Grofers, Big basket, etc. In spite of sincere efforts by Lalaji, the business suffered losses. In the third year of operations, the company stopped paying salaries and loans. The company was served a legal notice and assets were sold to repay the debts. Investors demanded that 'Lalaji's' personal assets should be sold but the auctioneer refused to do so.

Are the investors justified while asking for Lalaji's personal assets to be sold? [4]

27] Suhasini and some of her friends jointly set up 'Trimurti Limited'. The business of their company was to manufacture blankets at a low rate. At the time of setting up of the company they issued 25000 shares of the face value of ₹100. In this way they started their business with a capital of ₹25 lac. Before collecting the money from the public, they decided that they would issue such security as should not let the company undergo any fixed financial burden. Also they wished to have the capital from such a source as should enable the company to keep the capital for a long time. To collect the capital Suhasini and her friends issued prospectus. Through it they told the public that in the coming years, the company expected to earn a big profit and that the price of its shares would be very high. As a result, the investors would be able to earn extra profit. In the prospectus it was also said that the company would organise its meetings from time to time and that investors would be invited to these meetings. They would have the right to cast their votes in these meetings. The company collected money from the public and the company's business started. The company started earning more profit than what had been promised to the investors.

- (a) Identify the type of shares issued by 'Trimurti Limited.'
(b) Quoting the relevant lines write about the two advantages each to the investors and to the company from the shares identified in (a). [4]

28] Explain the procedure to get export licence in India. [4]

29] 'Rakhi Footwear Ltd.' deals in shoes. This company has opened 500 shops at different places of the whole country. The speciality of the business of this company is that at all its shops the goods available are of the same type and their price also is the same. By starting this type of business the company has done away with the middlemen. The people are happy to buy goods from the producer or manufacturer directly. Identify the trade of 'Rakhi Footwear Ltd.' and describe any three of its advantages. [4]

30] Explain any two sources of finance available in India for the start ups. [4]

31] Mr Sudhir Manchanda is a small manufacturer of automobile components. His factory is located in Gurugram and employs about 55 workers with an investment of ₹9.2 million in plant and machinery. Due to recession in the domestic market, he foresees prospects of his sales going up in the next few years in the domestic market. He is exploring the possibility of going international. Some of his competitors are already in export business. A casual talk with one of his close friends in the tyre business reveals that there is a substantial market for automobile components and accessories in South-East Asia and Middle East. But his friend also tells him, "Doing business internationally is not the same as carrying out business within the home country. International business is more complex as one has to operate under market conditions that are different from those that one faces in domestic business".

a] Explain to Mr Manchanda the difference between internal trade and international trade.

b] Do you think that Mr Manchanda's friend is trying to deter him from entering international business? [6]

32] Saraswati Limited manufactures notebooks and copies. The company is constantly facing the problem of inadequate working capital and because of this, the production process is frequently disrupted. Explain to the management the importance of working capital and any three external sources from where the company can manage working capital. [6]

OR

Board of Directors of "Bio Pure water Ltd." decides to set up its first unit in the hilly area of Himachal Pradesh Company requires Rs. 3 crores for it and Rs. 50 Lakhs for working capital. The company has earned marked 15% of its profit for Educational and Health needs of its employees and their family members.

(a) The above company comes under which category as per MSMED Act (2006)

- (b) Write any one commercial reason for setting up of unit in the hilly region. [6]
33] Write the name of the enterprise which is set up as a consequence of partnership between government and private enterprise. Write its features. [6]

OR

"Multinational companies are a mixed blessing to the developing countries." Comment on the statement. [6]

34] (a) "Earning of profit cannot be the objective of business any more than the eating is the objective of living." Do you agree with the statement? Give reasons

(b) What are the other objectives of business? [4+2]

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1] One of the limitations of accounting is that the figure given in financial statements ignores the effects of changes in price level. [1]

- | | |
|---------------------|---------------|
| (a) True | (b) False |
| (c) Partially false | (d) can't say |

OR

Which of this is not an internal user of accounting? [1]

- | | |
|----------------|-------------------------|
| (a) Owners | (b) Employees |
| (c) Management | (d) Potential investors |

2] Neeraj Ltd. is engaged in a laptop trading business the total assets of business are ₹ 10,40,000 and outside liabilities are ₹1,80,000. What will be the owner's equity? [1]

- | | |
|----------------|-------------------------|
| (a) ₹12,20,000 | (b) ₹9,60,000 |
| (c) ₹8,60,000 | (d) Can't be determined |

3] Assertion (A): Journal is a book of original entry. [1]

Reason(R): The transactions are first recorded in a journal in a chronological order.

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)
- (c) Assertion (A) is true, but Reason (R) is false
- (d) Assertion (A) is false, but Reason (R) is true

OR

Rebate is usually allowed for

- (a) Inferior quality of goods sold
- (b) goods sold being not as per specification
- (c) Both (a) and (b)
- (d) None of the above

4] When a firm maintains a cash book, it need not maintain [1]

- (a) journal proper
- (b) Purchases (journal) book
- (c) Sales (journal) book
- (d) Bank and cash account in the ledger

OR

Cash sales are recorded in the

- | | |
|-------------------|-------------------|
| (a) Sales book | (b) Cash book |
| (c) Purchase book | (d) none of these |

5] Balance Sheet is prepared: [1]

- | | |
|-----------------------------|------------------------|
| (a) For a particular period | (b) For the whole year |
| (c) On a particular date | (d) none of the above |

6] Bills Receivable discounted but not due till the date of final accounts [1]

- | | | | |
|---------|------------|-----------------|----------------|
| (a) P&L | (b) Assets | (c) Liabilities | (d) Foot notes |
|---------|------------|-----------------|----------------|

7] According to business entity principle, business is treated as a unit separate and distinct from its [1]

- | | | | |
|------------|---------------|------------------|------------------|
| (a) Owners | (b) promoters | (c) Shareholders | (d) All of these |
|------------|---------------|------------------|------------------|

OR

'Double entry system' is based on which accounting principle concept? [1]

- | | |
|---------------------------|-------------------------------|
| (a) Going concern concept | (b) Business entity principle |
| (c) Matching principle | (d) Dual aspect principle |

8] Which of the following factors affect the useful life of an asset? [1]

- (i) Legal or contractual limits
- (ii) Repair and maintenance policy of the business organisation
- (iii) Technological obsolescence

(iv) The number of shifts for which asset is to be used

- (a) Only (i) (b) (i) and (iii)
(c) (i), (iii) and (iv) (d) (i), (ii), (iii), (iv)

OR

Under method, a fixed and equal amount in the form of depreciation is charged every year during the life time of the asset. [1]

- (a) Straight line (b) written down value
(c) Annuity (d) insurance policy

9] Goods means: [1]

- (a) Commodity to be bought and sold
(b) Commodity to be bought but not to be sold
(c) Commodity to be used as an asset
(d) None of these

10] Assertion (A): A bank reconciliation statement is a statement prepared to reconcile the bank balance as per cash book with the balance as per pass book or bank statement.

Reason (R): The amount of balance shown in the pass book or the bank statement must tally with the balance as shown in the cash book.

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)
(c) Assertion (A) is true, but Reason (R) is false
(d) Assertion (A) is false, but Reason (R) is true [1]

11] ₹ 50,000 received on sale of an old car will be credited to: [1]

- (a) Sales A/c (b) Capital A/c
(c) Car A/c (d) Drawing A/c

12] Capital expenditure will be reflected in [1]

- (a) Trading account (b) Profit and loss account
(c) Profit and loss appropriation account (d) Balance sheet

13] Suspense Account in the trial balance will be entered in the: [1]

- (a) Manufacturing A/c (b) Trading A/c
(c) Profit & Loss A/c (d) Balance Sheet

14] Which of these is not a part of current liabilities? [1]

- (a) Bank overdraft (b) Bills payable
(c) Debentures (d) Creditors

15] Pass journal entry if goods costing ₹ 50,000 are sold for ₹ 70,000. [1]

- (a) Cash A/c –Dr 50,000 (b) Cash A/c Dr 70,000
To Sales A/c 50,000 To Sales A/c 50,000
(c) Cash A/c Dr 70,000 (d) None of the above
To Goods A/c 70,000

OR

Accrued rent is a [1]

- (a) Real Account (b) Nominal Account
(c) Representative personal Account (d) artificial personal account

16] The term is used in the context of extraction of natural resources like mines, quarries, etc., that reduces the availability of the quantity of the material or asset. [1]

- (a) Depreciation (b) depletion (c) Amortisation (d) None of the above

17] is a reserve which does not appear in the balance sheet. [1]

- (a) General reserve (b) Specific reserve
(c) Secret reserve (d) Capital reserve

18] Which of the following accounts always shows a credit balance? [1]

- (a) Carriage Inward (b) Carriage Outward
(c) Return Inwards (d) Returns Outwards

OR

Which of these accounts has debit balance? [1]

- (a) Income received in advance (b) Bank loan
(c) Prepaid insurance premium (d) Creditors for goods

19] Debit balance of pass book means: [1]

- (a) Positive i.e. Favourable Balance (b) Negative i.e. Unfavourable Balance
(c) Either Positive or Negative Balance (d) None of the above

- 20] Depreciation is a cash expense. [1]
 (a) True (b) False (c) Can't say (d) partially true
- 21] Explain the following accounting principles. [3]
 I] Matching concept II] Money measurement concept
 OR
 Distinguish between cash basis of accounting and accrual basis of accounting. [3]
- 22] Prepare a voucher for Abhishek enterprises when M/s Abhishek enterprises Shivmandir, does following purchases for cash: [3]
 20 Chairs @ ₹300
 15 tables @ ₹900
- 23] Pass entries in the books of Mukerjee & Sons. assuming all transactions have taken place within the state of Uttar Pradesh. Assume CGST @9% and SGST @9% [3]
 2018
 March 4 Purchased goods for ₹5,00,000 from Mehta Bros.
 March 10 Sold goods for ₹8,00,000 to Munjal & Co
 March 15 Paid for advertisement ₹40,000 by cheque
- 24] From the transactions given below prepare the Sales Book of Ram (U.P.) for July 2022. (IGST 12 %). [3]
 2022
 July 5 Sold on credit to S.S. Traders New Delhi
 10 Chairs @ ₹ 2500
 10 Tables @ ₹ 8500
 Less 10%
 July 12 Sold to Raja U.P. for cash
 15 Chairs @ ₹ 2500
 July 20 Sold to Mohan & Co. Patna, Bihar
 5 Almirah @ ₹ 2,2000
 10 Tables @ ₹ 8500
 July 23 Sold on credit to Narayanan, Bangalore
 old computer for ₹ 5,000
 July 28 Sold to Kumaran, Varanasi, U.P. for cash
 15 Chairs @ ₹ 2500

- 25] Distinguish between provision and reserves. [3]
- 26] Calculate gross profit and cost of goods sold from the following information: [3]
 Net Sales ₹12,00,000 Gross Profit is 20% on cost
 OR
 Ascertain the value of closing stock from the following:
 Opening Stock ₹1,20,000 Purchases during the year ₹9,30,000 Sales during the year ₹15,60,000 Rate of Gross Profit 40% on Sales [3]
- 27] Prepare Accounting Equation from the following: [4]
 (a) Started business with Cash ₹ 4,00,000.
 (b) Purchased goods for Cash ₹ 60,000 and furniture for ₹ 1,50,000.
 (c) Sold $\frac{1}{3}$ rd goods for Cash at a profit of 20%.
 (d) Paid for Rent ₹ 5,000 out of which ₹ 2,000 is in advance.
- 28] Enter the following transaction in a double column cash book of M/s Mohit Traders for January 2017: [4]
- | | ₹ |
|---|-------|
| 01 Cash in hand | 3,500 |
| Bank overdraft | 2,300 |
| 03 Goods purchased for cash | 1,200 |
| 05 Paid wages | 200 |
| 10 Cash sales | 8,000 |
| 15 Deposited into bank | 6,000 |
| 22 Sold goods for cheque which was deposited into bank same day | 2,000 |
| 25 Paid rent by cheque | 1,200 |
| 28 Drew from bank for personal use | 1,000 |
| 31 Bought goods by cheque | 1,000 |

29] Prepare a Trial Balance from the following items: [4]

	₹		₹
Capital	24,000	Building	12,000
Opening Stock	8,500	Returns Inward	1,900
Furniture	2,600	Returns Outward	350
Purchases	8,950	Trade Expenses	1,000
Cash	7,300	Discount Received	970
Carriage	300	Salary	3,000
Sales	22,500	Office Rent	2,270

OR

Prepare ledgers for Ram and Sundar [4]

2022

Jan 1 Purchased goods from Ram of ₹20,000 at a trade discount of 10%

Jan 12 Sold goods to sundar for ₹30,000

Jan 15 Cheque of ₹17,500 paid to Ram for full settlement of his dues.

Jan 18 Received from Sundar half in cash and half in cheque after a discount of 5%.

Jan 20 Sundar's cheque dishonoured with a noting charge of ₹50.

30] Pass Journal Entries for the following transactions:- [6]

i] Received cash ₹1,000 for bad-debts written off last year.

ii] Purchased furniture for ₹ 6,000 for the proprietor and paid the amount by cheque.

iii] Purchased goods for Cash ₹10,000 and spent ₹200 for their carriage.

iv] Paid rent in advance ₹10,000.

v] Goods for ₹50,000 were destroyed by fire.

vi] Received commission ₹5,000 out of which ₹2,000 is in advance.

31] Prepare Bank Reconciliation Statement from the following particulars as on 31st March, 2021, when Pass Book shows a debit balance of ₹2,500: [6]

(i) Cheque issued for ₹5,000 but up to 31st March, 2021 only ₹3,000 could be cleared.

(ii) Cheques issued for ₹1,000 but omitted to be recorded in the Cash Book.

(iii) Cheques deposited for ₹5,500 but cheques for ₹500 were collected on 4th April 2021.

(iv) A discounted Bills of Exchange dishonoured ₹1,000.

(v) A cheque of ₹500 debited in Cash Book but omitted to be banked.

(vi) Interest allowed by bank ₹200 but no entry was passed in the Cash Book.

32] X bought a machine for ₹ 35,000 on which he spent ₹ 5,000 and another machine for ₹ 40,000 on July 1 2019. The machine is depreciated @ 10% p.a. on Written Down Value basis. On 31st March 2021, the 1st Machine was sold to Y for ₹ 30,500 and ₹ 500 was paid as commission to the broker through whom the sale was effected. Find out the profit and loss on sale of machine by preparing Machinery Account. [6]

OR

A Van was purchased on 1st April, 2019 for ₹60,000 and ₹ 5,000 was spent on its repair and registration. On 1st October, 2020 another van was purchased for ₹70,000. On 1st April, 2021, the first van purchased on 1st April, 2019 was sold for ₹45,000 and a new van costing ₹1,70,000 was purchased on the same date. Show the Van Account and provision for depreciation account on the basis of Straight Line Method, if the rate of Depreciation charged is 10% p.a. Assume that books are closed on 31st March every year. [6]

33] Trial Balance of Madan did not agree and he put the difference to Suspense Account. He discovered the following errors: [6]

i] Installation charges on new machinery purchased ₹500 were debited to sundry expenses account as ₹50.

ii] Rent paid for residential accommodation of Madan (the proprietor) ₹1,400 was debited to Rent A/c as ₹1,000.

iii] ₹5,400 received from Mr. A was posted to the debit of his account.

iv] Amount payable to Subhash for repairs done to radio ₹180 and a new radio supplied for ₹1,920, were entered in the Purchase book as ₹2,000.

v] ₹780, paid for freight on machinery purchased was debited to Freight Account as ₹708.

vi] No entries have been made in the Cash Book for the Insurance Premium directly paid by bank ₹700 and interest charged on overdraft ₹320.

34] Following are the balances extracted from the books of Narain on 31st March, 2019: [6]

Particulars	₹	Particulars	₹
Narain's Capital	3,00,000	Sales	15,00,000
Narain's Drawings	50,000	Sales Return	20,000
Furniture and Fittings	26,000	Discounts (Dr.)	16,000
Bank Overdraft	42,000	Discounts (Cr.)	20,000
Creditors	1,38,000	Insurance	20,000
Business Premises	2,00,000	General Expenses	40,000
Stock on 1st April, 2018	2,20,000	Salaries	90,000
Debtors	1,80,000	Commission (Dr.)	22,000
Rent from Tenants	10,000	Carriage on Purchases	18,000
Purchases	11,00,000	Bad Debts Written off	8,000

Additional Information:

- Closing Stock as on 31st March, 2019 was ₹ 2,20,000, whereas its Net Realisable Value (Market Value) was ₹ 2,05,000.
- Depreciate: Business Premises by ₹ 3,000 and Furniture and Fittings by ₹ 2,500.
- Make a provision of 5% on debtors for doubtful debts.
- Carry forward ₹ 2,000 for unexpired insurance.
- Outstanding salary was ₹ 15,000.

Prepare Trading and Profit and Loss Account for the year

OR

From the following Trial Balance of Ramesh, prepare Trading, Profit and Loss Account for the year ending 31st March, 2019 [6]

Particulars	₹	₹
Drawings	15,000	
Capital		3,50,000
Plant and Machinery	2,05,000	
Debtors	50,000	
Creditors		28,000
Return inward	8,000	
Return outward		7,000
Discount allowed	7,000	
Discount received		6,000
Commission	15,000	
Interest on Bank Loan	12,000	
Furniture	55,000	
Provision for Doubtful Debts		13,000
Wages	50,000	
Salaries	45,000	
Advertisement	15,000	
Rent and Taxes	13,000	
Purchases	2,60,000	
Sales		4,00,000
Stock on 1st April, 2018	70,000	
Carriage	5,000	
Land and Building	98,000	
Cash in Hand	8,000	
Cash at Bank	20,000	
10% Bank Loan as on 1st April, 2018		1,50,000
Input CGST	9,000	
Input SGST	9,000	
Output IGST		15,000
Total	9,69,000	9,69,000

Adjustments:

- Cost of stock on 31st March, 2019 was ₹ 37,000. However, its market value was ₹ 35,000.
- Wages outstanding were ₹ 6,000 and salaries outstanding were ₹ 5,000 on 31st March, 2019.
- Depreciate Land and Building @ 2½%, Plant and Machinery @ 10% p.a. and Furniture @ 15% p.a.
- Purchase includes purchase of machinery for ₹ 10,000 on 1st October, 2018.
- Debtors include bad debts of ₹ 2,000. Maintain a provision for doubtful debts @ 10% on Debtors.

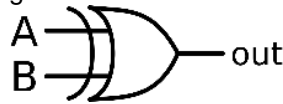
General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Sections A have 18 questions carrying 01 markeach.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each.
8. All programming questions are to be answered using Python Language only.

SECTION A: OBJECTIVE TYPE QUESTIONS 18 QUESTIONS

Answer the following questions (18 x 1= 18)

1] It is a _____ Logical Gate.



2] The Boolean equation express the law $A+(B+C) = (A+B)+C$

- a] Associative Law
- b] Idempotence law
- c] Involution law
- d] Commutative Law

3] Name two common tools for developing an algorithm.

4]The input() returns the value as _____ type.

5] Name any one jump statement.

6]Which of the following can delete an element from a list if the index of the element is given?

- a]pop()
- b]remove
- c]del
- d]all of these

7]List can contain values of these types

- a]Integers
- b] float
- c]strings
- d]all of these

8]Flow of control can be of the following types:

- a]sequential
- b]iterative
- c]derivative
- d]both a and b

9]The precise step by step instructions given to perform a task are called

- a]flowchart
- b] algorithm
- c]SDLC
- d]all of these

10]The choice of algorithm is made on the basis of

- a]ease of development
- c]time & space complexity

- b] user's choice
- d]none of these

11] Draw a flowchart to generate the Fibonacci Series as 1,1,2,3,5,8..... N terms. Where N is the number of terms given by the user.

12]Which of the following is not a valid identifier?

- a]Mybook
- b] @book
- c]_book
- d]book23

13]Choose the correct syntax for printing values in the same line.

- a]print(a,b)
- b]print(a, end= " ",b)
- c]print(a, end= "\$",b)
- d]print(a)print(b)

14]What do we use to define a block of code in python language?

- a]Key
- b] Brackets
- c]Indentation
- d]None of these

15]Variables in python do not have fixed memory locations.

- a]True
- b] False

16]Write the advantages of python.

17]Find the error.

```
hello=4
a=5
c=hello*a*a
1class=c+20
2class=1class * 10
```

18]What will be the output of the following python code and why?

```
age=input("Enter your age")
ageafter10=age+10
```

SECTION B: VERY SHORT TYPE QUESTIONS (07 QUESTIONS)

Answer the following questions (7x 2 = 14)

19]State any two differences between compiler and interpreter?

20] What will be the output of the following statements?

```
print(False ==0),
print(type(True)==type(1))
```

21]What do you mean by 'immutable'? Explain with an example.

22]Identify the types of errors?

a]division by zero
b]Print(a+b)
c]a+b=c

23]Write the difference between runtime error and compile time error.

24]Differentiate between for loop and while loop.

25]Write a program to swap two numbers without using a third variable.

SECTION C: SHORT TYPE QUESTIONS (05 QUESTIONS)

Answer the following questions (5x 3 = 15)

26]Write the output of these code:

```
for m in range(3):  
    for n in range(2):  
        print(m,n,m*n)
```

27] Write a program to accept an amount from the user and print the discount given along with the final amount to be paid. The program should give 5% discount if the amount entered is over 5000,otherwise no discount.

28]Describe some common forms of student plagiarism.

29]Write the differences between the following

a]Copyrights and Patents
b]Non-ethical hacking and Ethical hacking

30]What do you mean by identity theft? Explain with the help of an example.

SECTION D: LONG TYPE QUESTIONS (03 QUESTIONS)

Answer the following questions (3 x 5 = 15)

31]Find Output: (3+2)

```
[a] str="Python123.com"  
for i in range(len(str)):  
    if(str[i].isalpha( )):  
        print(str[i-1],end="")  
    if(str[i].isdigit( )):  
        print(str[i],end="")
```

```
[b] s='mahender, singh, dhoni'  
s1=s.split( )
```

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for i in s1:

```
if(i>'n'):  
    print(i.upper( ))  
else:  
    print(i)
```

32]Find Output:

```
list1 = ["python", "list", 1952, 2323, 432]  
list2 = ["this", "is", "another", "list"]  
print(list1[1:4])  
print(list1[1:])  
print(list1[0])  
print(list1 * 2)  
print(list1 + list2)
```

33] What will be the output of the following code?

```
X=True  
y=100  
while x:  
    print(y)  
    y=y-10  
    if y<50:  
        x=False
```

Show with the help of a dry run table

SECTION E: LONG TYPE QUESTIONS (02 QUESTIONS)

Answer the following questions (2 x 4 = 8)

34]Write a menu driven program in python language which takes an integer number as input and as per user choice checks whether the number is a prime number(having only 2 factors) or a palindrome number (reverse of the number is equal to the original number).

35]Write a program to input a list and an element and remove all occurrences of the given element from the list.

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Modi Public School, Siliguri

Annual Examination 2022-23

Class 11

Sub AI

Time :2Hr F.M. :50

General Instructions:

Please read the instructions carefully.

1. This Question Paper consists of 21 questions in two sections: Section A & Section B.
2. Section A has Objective type questions whereas Section B contains Subjective type questions.
3. **Out of the given (5 + 16 =)21 questions, a candidate has to answer (5 + 10 =) 15 questions in the allotted (maximum) time of 2 hours.**
4. All questions of a particular section must be attempted in the correct order.
5. SECTION A - OBJECTIVE TYPE QUESTIONS (24 MARKS):
6. SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS):

SECTION A: OBJECTIVE TYPE QUESTIONS

Q.1. Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4 marks)

i] _____ is the ability to plan and control how you spend the hours of your day well and all that you want to do.

- a] Self Management b] Time Management
c] Goal setting Management d] none of the above

ii] An individual who starts, creates and manages a new business can be called

- a] A leader b]A manager
c]A professional d]An entrepreneur

iii] What makes you complete your work or studies without others cheering you?

- a] Self-confidence b] Communication
c] Self-motivation d] Self-esteem

iv] A _____ is a business that turns raw materials into finished products to fulfill customer needs.

- a] Manufacturing Busines b] Service Business
c]Trading Business d] All of the above

v] Ravi works hard to get the best student award at the end of the year. What type of motivation is this?

- a] Internal b] External
c] Both internal and external d] Not any specific type of motivation

vi] Innovation can best be defined as .

- a] the generation of new ideas. b] the evolution of new ideas.
c] the opposite of creativity. d]the successful exploitation of new ideas.

Q2.Answer any 5 out of the given 6 questions Subject specific skills (1 x 5 = 5 marks)

i] _____ refers to the layers in ANN where actual processing happens.

- a] Input layer b]Hidden Layer
c]Output layer d] All of the above

ii] _____ works of reward process.

- a] Machine Learning b]Unsupervised learning
c] Supervised learning d] Reinforcement learning

iii] State True or False: Automatic tagging of photos on social media is an example of machine learning in our everyday life.

iv] Which of the following is an example of AI?

- a]Search Online b]Ask Siri or Alexa for recommendation
c]AGI Humanoid d] All of these.

v] _____ is often categorized as qualitative data and it cannot be processed and analyzed using conventional relational database methods.

- a]Structured Data b]Unstructured Data
c] Recommended data d] Autocorrected data

vi] Which of these is a characteristic of Deep learning?

- a] Works on large amount of data set b]Depended on low-end machine
c]Takes less time to train d]Testing time may increase

Q3.Answer any 5 out of the given 6 questions Subject specific skills (1 x 5 = 5 marks)

i]Which one of these is a disadvantage of AI?

a] The AI system can replace humans in repetitive, tedious tasks and in many laborious places of work.

b]AI systems can also organize and manage huge volumes of data.

c]They can be used in robotic radiosurgery.

d] Can cost a lot of money, technology and time to build, rebuild and repair.

ii] Unscramble the letters and find the name the first humanoid robot with a citizenship

- a] TERBHER OXEVE b] IA OHSP c] IRIS d] ACTROAN

iii] Which of the following is incorrect about human intelligence?

- a] Humans have the ability to learn.
 b] Humans cannot take decisions according to the situation.
 c] They apply logic.
 d] They can solve problems by applying logic.

iv] Assertion (A): AI is getting integrated into our lives seamlessly.

Reason (R): Often we do not even realize that we are using AI.

Select the appropriate option for the statements given above:

- a. Both A and R are true and R is the correct explanation of A
 b. Both A and R are true and R is not the correct explanation of A
 c. A is true but R is false
 d. A is False but R is true

v] Image based search, scanning bar codes, QR codes and finding people depending on face

recognition use which domain of AI.

- a] NLP b] Data
 c] Computer Vision d] Database

vi] What does this image depict?

- a] Chatbots b] Computer Games
 c] Robots d] Cognitive Computing



Q4. Answer any 5 out of the given 6 questions Subject specific skills (1 x 5 = 5)

i] Match the correct option

A. Data	1. No predefined labels.
B. Computer Vision	2. Structured and Unstructured
C. NLP	3. Pattern recognition
D. Unsupervised Learning	4. NLU and NLG

a] A->4 B->2 C->1 D->3

b] A->1 B->2 C->3 D->4

c] A->2 B->1 C->4 D->3

d] A->2 B->3 C->4 D->1

ii] _____ is an example of Applications of Natural Language Processing.

- a] Evaluation b] Automatic Text Summarization
 c] Deep Learning d] Problem Scoping

iii] This is a Smart Self driven car which uses a special device at the top to get the 360-degree view

range when it is moving in the road. What is this device?



- a] Gyroscope b] LiDAR
 c] Tachometer d] Altimeter

iv] _____ is a subset of Artificial Intelligence which enables machines with cameras to see and understand digital images.

- a] Machine learning b] Chat bot
 c] ANN d] Computer vision

v] No _____ are present in an AI system.

- a] features b] emotions
 c] algorithms d] None of these.

vi] _____ classification refers to those classification task where we have only possible 2 outcomes.

- a] Multi classification b] Confusion Matrix
 c] Binary Classification d] None of the above

Q5. Answer any 5 out of the given 6 questions Subject specific skills (1 x 5 = 5)

i] When visuals are applied to data, they provide _____ to audience

- a] Interest b] Abilities
 c] Insight d] All of these

ii] Who coined the term Artificial Intelligence?

- a] Alan Turing
- b] John McCarthy
- c] Charles Babbage
- d] Allen Newell

iii] A well-told story is an inspirational narrative that is crafted to engage the audience across _____.

- a] Boundaries
- b] Culture
- c] Boundaries and Culture
- d] None of these

iv] The goal of clustering is to-

- a] Divide the data points into groups
- b] Predict the output values of input data points
- c] Classify the data point into different classes
- d] All of the above

v] For clustering, we do not require-

- a] Labeled data
- b] Unlabeled data
- c] Numerical data
- d] Categorical data

vi] The final output of Hierarchical clustering is-

- a] The number of cluster centroids
- b] The tree representing how close the data points are to each other
- c] A map defining the similar data points into individual groups
- d] All of the above

SECTION B: SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of the given 5 questions on Employability Skills (2 x 3 = 6)

- Q6] State some values which make an entrepreneur successful.
- Q7] Define Goal Setting .How are goals useful ?
- Q8] What are the benefits of Teamwork?
- Q9] What is the difference between manufacturing and trading business activities?
- Q10] Write the key differences in attitudes between entrepreneurs and employees. Describe with examples.

Answer any 4 out of the given 6 questions in 20 – 30 words each (2 x 4 = 8)

- Q11] Why do we need a confusion matrix ?
- Q12] What are the difference between ML and DL?
- Q13] Write the steps to cluster the data.

Q14] Define clustering with examples.

Q15] Difference between Conventional programming approach and Machine Learning approach.

Q16] What are the types of classification algorithm ? Give two example of each.
Answer any 3 out of the given 5 questions in 50– 80 words each (4 x 3 = 12 marks)

Q17] Write the steps involved in telling an effective data story.

Q18] What is K- means Clustering? List two advantages and disadvantages of k-Means Clustering.

Q19]What do you mean by chat bot? what are the types? Give example

20] What are the three key elements of data storytelling ?Explain.

21] Below is a confusion matrix prepared for a binary classifier to detect email as Spam and Not Spam. Find the Recall and Precision.

		Predicted Class	
		Spam	No-spam
Actual Class	Spam	12	3
	No-spam	4	81

General Instructions:

1. Please read the instructions carefully.
2. This Question Paper consists of two sections: Section A & Section B.
3. Section A has Objective type questions whereas Section B contains Subjective type questions.
4. SECTION A - OBJECTIVE TYPE QUESTIONS (24 MARKS).
5. SECTION B – SUBJECTIVE TYPE QUESTIONS (26 MARKS).

SECTION A: OBJECTIVE TYPE QUESTIONS

1. Answer any 4 out of the given 6 questions on Employability Skills (1 x 4 = 4)

[i] Namaya gets up at 5 am and goes for her dance classes. Then she comes home and finishes her homework before going to school. This is an example of _____ .

- [a]Self-Awareness [b]Self-Motivation
[c]Self-Regulation [d]None of the above

[ii] Which of the following is a quality of a self-confident person?

- [a]Patient [b]Compassionate [c]Committed [d] Passionate

[iii] Danish buys wood for his business from Chennai. He learns that wood is cheaper in pune. So, he decides to start buying wood from pune. Which quality he is showing _____ .

- [a]Takes decision [b]Divides income
[c]Takes risk [d]None of the above

[iv] An entrepreneur's primary motivation for starting a business is _____.

- [a]To make money [b]To be independent
[c]To be famous [d] To be powerful

[v] ICT refers to all the methods, tools ,concepts related to

- [a]storing digital information [b]recording digital information
[c] sending digital information [d] All of the above

[vi]Which of the following ways are used to record or store information?

- [a]handwritten on paper [b]written using a typewriter
[c]typed in computer [d]All of the above

2. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

- [i] Which of the following is incorrect about a story?
a] A story generally consists of one or more character(s)
b] A story represents the point of view of a person
c] A story has a theme associated with it
d] Things revealed in a story are always correct and exist in the real world.

[ii] Which of the following is an example of NO correlation?

- a] The age of a child and his/her shoe size.
- b] The age of a child and his/her height.
- c] The age of a child and the number of pets owned.
- d] The age of a child and vocabulary of words learned.

[iii] Which of the following statements given below shows a causal relationship and not just a correlated one?

- a) An individual's decision to work in construction and his/her diagnosis of skin disease.
- b) A decrease in temperature and an increase in the presence of people at ice skating rink.
- c) As the weight of a child increases so does his/her vocabulary.
- d) The time spent exercising and the number of calories burned.

[iv] A person runs a small business and keeps all his/her business records on an unprotected personal computer. These records include essential information about his/her customers. Since it is a small business, that person believes that he/she is unlikely to be a target for hackers. According to him/her, several years have passed, and information on his/her unprotected computer has never been compromised. Are the actions of that person ethical?

- a] Yes
- b] No

[v] Once I have voluntarily shared some information about myself on the web, it means that this information is no longer private and can be shared freely.

- a] True
- b] False

[vi] Undesired dissemination of previously collected data violates privacy.

- a] True
- b] False

3. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

[i] Which of the following is incorrect about a story?

- a] A story generally consists of one or more character(s)
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- c] The age of a child and the number of pets owned.
- d] The age of a child and vocabulary of words learned.

[iii] A study outlines that people who run more outdoors have higher rates of skin disease than people who exercise indoors. Which one of these seems the most likely to be connection between running and diseases?

- a] Running produces a chemical that causes skin disease.

b] People who run generally drink more water and sports drinks, which might weaken the immune system's ability to attack disease germs.

c] People who run do so because they are obese and might have poor health conditions, to begin with.

d] People who run outdoors spend more time in the sun. Thus, they are exposed to harmful sunlight for more extended periods.

[iv] In forecasting, past and present data are used to predict the future as accurately as possible.

- a] The above statement is always true.
- b] The above statement is never true.
- c] The above statement is sometimes true.
- d] None of the above.

[v] Which one of the below-mentioned scenarios appears most likely to be from causation?

- a] Reading one hour per day increases vocabulary.
- b] People who are homeless are more likely to have mental health issues.
- c] The weight of a person has nothing to do with the risk of heart disease.
- d] In India, as car sales increase, the birth rate also increases.

[vi] Which of the following statements given below shows a causal relationship and not just a correlated one?

- a] An individual's decision to work in construction and his/her diagnosis of skin disease.
- b] A decrease in temperature and an increase in the presence of people at ice skating rink.
- c] As the weight of a child increases so does his/her vocabulary.
- d] The time spent exercising and the number of calories burned.

4. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

[i] Which of the following is not a disadvantage of observational study?

- a] We need to assign the subject to random treatment and control groups.
- b] Certain events may occur in the absence of the observer.
- c] Miss the reporting of critical observational details.
- d] Time spent is far more compared to the insights gained via observation.

[ii] Which of these is not true?

- a] Observational study is cheap.
- b] Observational study replaces interviewing.
- c] Observational study is time consuming.
- d] Observational study requires operational definition.

[iii] Observer's reliability is improved by:

- a] Training observers.
- b] Using operational definitions
- c] Restricting observations to specific time points
- d] All the above

[iv] If the actual demand for a period is 100 units but forecast demand was 90 units. The error in forecast is

- a] -10
- b] +10
- c] -5
- d] +5

[v] What is the best format in which online data should be collected perform analysis?

- a) RTF b) DOCX c) XML d) CSV

[vi] Sampling error can be reduced by:

- a) correcting a faulty sample frame b) increasing response rates
c) increasing the sample size d) reducing incomplete surveys

5. Answer any 5 out of the given 6 questions (1 x 5 = 5 marks)

[i] Out of the options given below, which one can be selected to be associated with survey research?

- a) The problem of objectivity b) The problem of "going native"
c) The problem of omission d) The problem of robustness

[ii] Greater dissimilarity within population of interest will:

- a) Increase the confidence interval
b) Decrease the confidence interval
c) Will have no impact on confidence interval
d) None of the above

[iii] Which of the following statement is false?

- a) Yes/No is an example of close ended question in a survey.
b) A rating scale of 1 – 10 is an example of close ended question in a survey.
c) A multiple-choice option is an example of close ended question in a survey.
d) Suggesting improvement is an example of close ended question in a survey.

[iv] Which of the following is a method of data collection by sensing?

- a) Use of speed guns to measure the speed of vehicles by traffic police.
b) Performing surveys to calculate population of the country.
c) Performing experiments and observing the results.
d) None of the above

[v] In vector, where all arguments are forced to a common type, please tick the correct order:

- a) Expression <logical < double b) Double < logical < NULL
c) Integer < character < expression d) Character < logical < raw

[vi] How many types of R objects are present in R data type?

- a) 4 b) 5 c) 6 d) 7

SECTION B: SUBJECTIVE TYPE QUESTIONS

5. Answer any 3 out of the given 5 questions on Employability Skills (2 x 3 = 6)

- [a] What are the key differences between product and service-based businesses?
[b] List any four characteristics of entrepreneurship.
[c] What is a blog?
[d] What are self management skills?
[e] What do you mean by self confidence.

6. Answer any 4 out of the given 6 questions in 20–30 words each (2 x 4 = 8)

- [a] Write the difference between correlation and causation?
[b] What are the different types of questions that a survey can contain? Provide two examples for each type of question.
[c] What is sampling bias? What is confidence interval?
[d] What is forecasting? Give two examples of forecasting.
[e] How many sets of variables are there in trial assessment? What are those variable?
[f] State the reasons why sometimes observational study is preferred over trial assessment?

7. Answer any 3 out of the given 5 questions in 50–80 words each (4 x 3 = 12)

- [a] Write an R program to create two numeric matrices and perform arithmetic operations like addition, subtraction, multiplication, and division.
[b] Explain with relevant examples why data scientists need to understand data and follow data ethics?
[c] Write an R program to create two numeric vectors and perform arithmetic operations like addition, subtraction, multiplication, and division. Suppose we have two vectors, $V1 = [2, 3, 0, 5]$ and $V2 = [6, 1, 7, 0]$.

i] $V1+V2$
[8, 4, 7, 5]

ii] $V1- V2$
[-4, 2, -7, 5]

iii] $V1*V2$
[12, 3, 0, 0]

iv] $V1/V2$
[0.33, 3, 0, Inf]

- [d] What is data governance framework? What are some of the benefits of implementing data governance framework?
[e] Write XML code for creating the following table:

Pizza Crust	Upvote
Thin Crust	50
Regular	10
Cheese Burst	30
Deep Dish	20