PRAYAG PUBLIC SCHOOL
SUMMER VACATION HOLIDAY (2025-26)
Class- 11

Biology

LONG ANSWER TYPE QUESTIONS:

1. Make a comparative account of the five kingdoms, in Whittaker's classification, on the following characters.(a) Cell wall (b) Body organization.
2. Give a comparative account of the classes of Kingdom Fungi under the following:
   (i) Mode of nutrition (ii) Mode of reproduction
3. Describe briefly the four major groups of Protozoa
4. Give a brief account of viruses with respect to their structure and nature of genetic material.Also name two viral diseases in plants.
5. Highlight the criteria considered for five-kingdom system of classification
6. Make a list of algae and fungi that have commercial value as source of food,chemicals,medicines and fodder

SHORT ANSWER TYPE QUESTIONS:

1. State two economically important uses of:
   (a) Heterotrophic bacteria (b) Archaebacteria
2. What is the nature of cell wall in diatoms?
3. Find out what the terms 'algal bloom' and 'red tides' do signify.
4. Who proposed the five-kingdom classification? Name the five kingdom
5. Why are Deuteromycetes commonly known as imperfect fungi? Mention two characteristics of mycelium of such fungi.
6. What is meant by '*contagium vivum fluidum*'? Who gave this idea?
7. Describe the three common steps in the sexual reproduction of fungi
8. What do the terms phycobiont and mycobiont signify?

(IT)

Practice Questions

1. What is the difference between RAM and ROM?
2. Explain the function of the control unit and ALU in the CPU.
3. Describe the types of operating systems and their characteristics.
4. How do you troubleshoot common hardware and software problems?
5. Why is secondary storage necessary in a computer system?
6. Compare the characteristics of different types of secondary storage devices.
7. What is the difference between input and output devices?
8. How does a keyboard work as an input device?
9. What are the advantages of using a Solid-State Drive (SSD) over a Hard Disk Drive (HDD)?
10. What is the function of a Graphics Card in a computer system?
11. What are some common causes of computer system crashes?
12. How do you troubleshoot a computer that won't turn on?
13. What steps would you take to troubleshoot a slow-performing computer?
14. How do you identify and remove malware from a computer system?
15. What is the difference between a virus and malware?
16. How do Trojans and worms differ in their behavior?
17. What are some common ways viruses spread?
18. How can you protect your computer from viruses?

Physical Education

Q-1 What is the aim of physical education?
Q-2 What do you mean by sport journalism?
Q-3 What is adaptive physical education?
Q-4 When was sports Authority of India established?
Q-5 Describe the principles if integrated and comprehensive physical education?
Q-6 Discuss the programmes of the sports Authority of India?
Q-7 What are the main objectives of physical education?
Q-8 Which principal are required to be followed to make the adapted physical education effective? Explain.
Q-9 Write a short note on the Olympic Flag?
Q-10 What is Olympic oath?
Q-11 Describe in brief the eligibility criteria for Dronacharya Award?
Q-12 Write a short note on the origin of Para Olympic Games?
Q-13 Explain the origin of Ancient Olympic Games?
Q-14 Describe the formation and objectives of Indian Olympic Association?
Q-15 Enlist the various Sports Awards and explain any one award in details?
Q-16 Define Physical fitness?
Q-17 What is meant by Lifestyle?

Q-18 What do you mean by khelo India Programme?
Q-19 List down the component of positive Lifestyle?
Q-20 Discuss 'healthy diet' as a component of positive Lifestyle?
Q-21 It is health which is real wealth, and not pieces of gold and silver comment?
Q-22 What do you mean by the term physical fitness? Explain the component of physical fitness in detail?
Q-23 It provides protection to vital organs of the body-
A) Respiratory system. B) Skeletal system. C) Cardiovascular system. D) Muscular system
Q-24 What is the meaning of Psyche?
A) Science. B) Soul. C) Behaviour. D) Environment
Q-25 What is not come undergrowth?
A) Increase in Weight. B) Increase in Height.
C) Increase in size. D) Increase in obesity
Q-26 What is the meaning of development?
A) Change in size. B) All of these. C) Change in structure of body organ. D)Change in maturity
Q-27 Effective planning can help in
A) Improve Efficiency. B) Reducing chances of mistake
C) All of these. D) Proper coordination
Q-28.National sports day in India is celebrated on:
A) 29th September. B) 21st August. C) 29th August D) 26th January
Q-29. Physical Education is the sum of changes in an individual caused by experience centering motor activity Who said this?
A) Prince Martin. B) Charls A.Butchar. C) Millions. D) Cassidy
Q30. Physical Education is the sum of men's physical activities selected as to kind and conducted as to outcomes who said this?
A) J.B. Nash. B) Charls A Butcha. C) C.C.Covel. D) Williams

हिंदी

1 'कबीर दास 'के पद का भावार्थ लिखिए और याद कीजिए।

2 'कबीर दास के पद' से संबंधित सभी प्रश्नों को याद कीजिए और लिखिए।

3 'मीरा के पद 'का भावार्थ लिखिए और याद कीजिए।

4 'मीरा के पद पाठ 'से संबंधित सभी प्रश्नों को याद कीजिए और लिखिए।

5 'नमक का दारोगा 'पाठ का सारांश लिखिए।

6 'नमक का दरोगा 'पाठ से संबंधित प्रश्नों को याद कीजिए और लिखिए।

7 'मियां नसीरुद्दीन 'पाठ का सारांश लिखिए।

8 'मियां नसीरुद्दीन 'पाठ से संबंधित प्रश्नों को याद कीजिए और लिखिए।

9 अपने किसी भी यात्रा का वर्णन लगभग 400 शब्दों में लिखिए।

10 अपने गांव के शिक्षा से वंचित बच्चों को शिक्षित करने के लिए आप क्या कर सकते हैं ? अपने विचारों को लगभग 150 शब्दों में लिखिए।

11. जनसंचार और मध्यम विषय पर एक प्रोजेक्ट फाइल तैयार कीजिए।

12. 'नेटवर्क मार्केटिंग 'से आप क्या समझते हैं ?इसके लाभ एवं हानि सहित लगभग 250 शब्दों में एक लेख लिखिए।

CLASS 11 - ENGLISH CORE

1	The poet **Shirley Toulson** has paid a tribute to her mother. Similar instances can be seen in **The Portrait of a Lady** . This made you think that writing about a loved one is much better than building their statues or drawing their portraits. Comment.
2	Why does the poetess compare hermother'slaughter too and why? Answer in the context ofA Photograph.
3	At the time of sunset, the grandmother's room was filled with a) aroma of incense and melodiousprayer b) a swarm of bees and flies c) thousands of sparrows d) more people from the neighbourhood
4	What did the grandmother do in her final hours? **(The Portrait of a Lady)** a) Talked to everyone in the house b) Went to temple c) Silently praying and telling her beads d) Worried about everyone
5	Why was it an absurd thought for the narrator for his grandmother to be young and pretty once when he was a child? **(The Portrait of a Lady)** a) Because she wasn't beautiful at all b) Because she had always been old c) Because she was a widow d) Because she was an image of misery
6	How did the grandmother spend her time in the city? **(The Portrait of a Lady)** a) Feedings dogs b) Talking to neighbours c) Spinning the wheel d) Reading scriptures

7	Khushwant Singh went abroad for education for how many years? a) For 5 years b) For 10 years c) For 3 years d) For 7 years
8	What change came in the grandmother's evening schedule? a) She would talk to his parents b) She would sleep early c) She collected the women of the neighbourhood d) She would go for a walk
9	What was the grandmother's reaction when the author was going abroad? **(The Portrait of a Lady)** a) Sentimental b) Sad c) Not even sentimental d) Happy
10	Where did the author go to study in the city? **(The Portrait of a Lady)** a) In a government School b) In a nearby school c) In an English School d) In a convent school
11	How did the grandmother enjoy the writer's homecoming? **(The Portrait of a Lady)** a) By beating the drum and singing b) By lighting up Diyas c) By dancing with the members of women club d) By arranging a grand procession
12	What made grandmother think differently? **(The portrait of a lady)** a) She was angry with the members of herfamily b) She was feeling unwell and sleepy c) She knew her death was near d) She was tired and she wanted to sleep more
13	How did the sparrows express their sorrow at the death of their grandmother? a) They came and sat silently in the verandah b) They didn't come that day c) They ate the bread crumbs d) They chirruped a lot
14	What could Khushwant Singh not believe about his grandmother? a) She went abroad for studies b) She was once a school topper c) She was once young and pretty d) She was a classical dancer
15	What happened when the author moved abroad to study for five years? **(The Portrait of a Lady)** a) Grandmother bid goodbye by silently kissing his forehead b) Parents moved with him c) No one came to see him d) Grandmother moved back to village
16	How did the grandmother react to her illness? **(The Portrait of a Lady)** a) She was admitted to the hospital b) She ignored her health c) She said her end was near d) She took care of her
17	How is the grandfather described by the writer? a) Young and strong b) At least 100 years old c) About 50 years old d) Some 150 years old
18	Grandmother ignored the protest of the family member because a) She was tired and hungry b) She was an arrogant lady c) She wanted to pray peacefully d) She had a mild fever
19	Where was the author's grandfather's portrait placed? **(The Portrait of a Lady)** a) On a table b) On a shelf c) Hung above the mantelpiece d) Put on the mantelpiece
20	What was the common link of friendship that the narrator had with his grandmother after moving to the city with his parents? **(The Portrait of a Lady)** a) The room that they shared b) The telephone at their city house c) The textbooks that he read d) Letters that they shared
21	What was her reaction when he came back after five years? **(The Portrait of a Lady)** a) Sentimental b) Clasped the author in her arms and said prayers c) Happy d) Overwhelmed
22	Where were the parents of the author? **(The Portrait of a Lady)** a) Abroad b) City c) Other village d) Other state
23	What was the happiest moment of the day for the grandmother? (The Portrait of a Lady)
24	How did the grandmother spend her whole day during author's childhood? Answer in the context ofThe Portrait of a Lady.
25	Why didn't the grandmother pray in the evening on the day the narrator came back home? Answer in the context of The Portrait of a Lady.
26	What are the chief qualities of the author's grandmother as depicted in ' The Portrait of a Lady?
27	Why was the grandmother so disturbed when the narrator started going to the city school? Answer in the context ofThe Portrait of a Lady.
28	Draw a character - sketch of Khushwant Singh's grandmother as portrayed by him in lesson 'The Portrait of a Lady'.
29	Mention three reasons why the author's grandmother was disturbed when he started going to the city school. (The Portrait of a Lady)
30	Read the following extract and answer the questions that follow: As the years rolled by we saw less of each other. For some time she continued to wake me up and get me ready for school. When I came back she would ask me what the teacher had taught me. I would tell her English words and little things of western science and learning, the law of gravity, Archimedes' Principle, the world being round, etc. This made her unhappy. She could not help me with my lessons. She did not believe in the things they taught at the English school and was distressed that there was no teaching about God and the scriptures. One day I announced that we were being given music lessons. She was very disturbed. To her music had lewd associations. It was the monopoly of harlots and beggars and not meant for gentlefolk. She said nothing but her silence meant disapproval. She rarely talked to me after that. 1. Why was the grandmother distressed about the education the narrator received at the English school?

	2. As the grandson, how would you persuade your grandmother that music and English education are valuable, considering her disapproval and traditional beliefs? 3. Pick evidence from passage that suggests that the protagonist's grandmother was unhappy with the content of his school education.
31	Consumerism is increasing day by day. Luxuries of yesterday have become necessities of today. The result is that the more we want the more miserable we become. Write a debate in 150 - 200 words on 'The only way to minimise human suffering and pain is to control our needs.' You are Navtej/Navita.
32	The Nilgiris Senior Secondary School is holding an interschool debate on the topic, **School bullies are a menace; they should be expelled** . You will be participating from your school in the debate. Write your debate in 150 - 200 words choosing a stand for or against the motion.
33	**Read the text carefully and answer the questions:** All three stood still to smile through their hair At the uncle with the camera. A sweet face, My mother's, that was before I was born. And the sea, which appears to have changed less, Washed their terribly transient feet. 1. Through **smile through their hair** , the poetess indicates that: a) the faces of the girls were covered with their hair. b) All of these c) the girls were having fun. d) it was a windy day. 2. What is the significance of the given lines? a) It indicates that the mother is dead. b) It depicts the change that comes with time. c) It shows that the poetess is missing her mother. d) It contrasts mortality of humans with immortality of the sea. 3. Which literary device is used in the given lines? a) Simile b) Paradox c) Personification d) Alliteration 4. What does the word **transient** indicate? a) Both ever - changingand shortness of human lives b) Permanence of human life c) Ever - changing human lives d) Shortness of human lives 5. **All three stood still to smile through their hair.** What does this line indicates? a) The fun the girls had b) The joy shared by the girls c) The pleasant weather d) The excitement of being at the beach
	Question No. 34 to 38 are based on the given text. Read the text carefully and answer the questions: Some twenty - thirty - years later She'd laugh at the snapshot."See Betty And Dolly, she'd say, and look how they Dressed us for the beach. The sea holiday Was her past, mine is her laughter. Both wry With the laboured ease of loss.
34	Who are Betty and Dolly? a) The poetess's aunts b) The poetess's cousins c) The poetess's friends d) The poetess's classmates
35	What does the poet indicate with **Mine is her laughter** ? 1. That the poet is missing her mother 2. That the poet's mother is dead. 3. That the poet's mother had stopped laughing. a) both i and ii b) only I c) only iii d) only ii
36	The phrase **laboured ease of loss** indicates: a) nostalgia b) regret c) pain d) despair
37	Identify the literary device used in the line **With the laboured ease of loss** . a) Oxymoron b) Metaphor c) Allusion d) Transferred epithet
38	What is the meaning of the word **wry** in the given context? a) Distressed b) Disgusted c) Disrupted d) Distorted
39	You are Krishna/ Tisha, Secretary, Greenland Enterprises Ltd, Delhi-110006. Your Chairman has asked you to draft an advertisement for a local daily under the classified columns for the vacant posts of one accountant and two office assistants. Draft an advertisement.

40	You are the manager, Herbal India Ltd. Draft an advertisement for your company for the post of two Sales Executives. Specify your requirements, qualifications, experience, and personality of the candidates. Answer:
41	The poet's mother laughed at the snapshot. What did this laugh indicate? Answer in the context of **A Photograph.**
42	The three stanzas of the poem **A Photograph** depict the three different phases. Name them.
43	According to **A Photograph**, The sea holiday was her past, mine is her laughter. Discuss.
44	Who had dressed the speaker? What was funny about the dress? Answer in the context of **A Photograph.**
45	What is the meaning of the line: Both wry with the laboured ease of loss. **(A Photograph)**
46	What has the camera captured? Answer in the context of A Photograph.
47	Explain: The sea holiday was her past, mine is her laughter. **(A Photograph)**
48	What is the significance of the **sea holiday** here? Answer in the context of A Photograph.
49	What are the losses of the poet's mother and the poet? Answer in the context of A Photograph.
50	Happy moments are short - lived but provide a lifetime memory. They provide a cushion to bear the difficulties which the future has in store for you. Comment in the light of the poem **A Photograph** by Shirley Toulson.

Physics

Objective Type Questions (One option is correct)

1. If n is the numerical value of a physical quantity in the system in which its unit is u, then which of the following relations is correct?

   (1) $\frac{n}{u}$ = constant (2) $\frac{u}{n}$ = constant

   (3) nu = constant (4) n^2u = constant

2. One nanometre is equal to

   (1) 10^9 mm (2) 10^{-6} cm

   (3) 10^{-7} cm (4) 10^{-9} cm

3. The unit of angular acceleration in the SI system is

   (1) N kg^{-1} (2) ms^{-2}

   (3) rad s^{-2} (4) m kg^{-1} K

4. A dimensionally correct equation _____ be a correct equation, and a dimensionally incorrect equation _____ be incorrect. The words (in order) to be filled in the blank spaces are

   (1) must, must (2) must, may

   (3) may, may (4) may, must

5. The physical quantities not having same dimensions are

   (1) Pressure and energy density

   (2) Torque and work

   (3) Momentum and Planck's constant

   (4) Stress and Young's modulus

6. The linear momentum p of a particle is given as a function of time t as $p = At^2 + Bt + C$. The dimensions of constant B are

   (1) $[M L^{-1} T^{-1}]$ (2) $[M L^{-1} T^{-2}]$

   (3) $[M L T^{-2}]$ (4) $[M L T^{-1}]$

7. The frequency of vibration f of a mass m suspended from a spring of spring constant k is given by a relation $f = cm^x k^y$; where c is a dimensionless quantity. The value of x and y are

   (1) $x = \frac{1}{2}, y = \frac{1}{2}$ (2) $x = -\frac{1}{2}, y = -\frac{1}{2}$

   (3) $x = \frac{1}{2}, y = -\frac{1}{2}$ (4) $x = -\frac{1}{2}, y = \frac{1}{2}$

8. Imagine a system of units in which the unit of mass is 100 kg, length is 1 km and time is 1 minute. Then 1 joule in this system is equal to

   (1) 360 (2) 3.6

   (3) 36×10^5 (4) 36×10^{-6}

9. If force (F), length (L) and time (T) are assumed to be fundamental units, then the dimensional formula of the mass will be

   (1) $[FL^{-1}T^2]$ (2) $[FL^{-1}T^{-2}]$

   (3) $[FL^{-1}T^{-1}]$ (4) $[FL^2T^2]$

10. Newton-second is the unit of

    (1) Velocity (2) Angular momentum

    (3) Momentum (4) Energy

11. A suitable unit for gravitational constant is

    (1) kg-m s^{-1}

    (2) Nm^{-1} s

    (3) Nm^2 kg^{-2}

    (4) kgm s

12. If the dimensions of a physical quantity are given by $M^aL^bT^c$, then the physical quantity will be

    (1) Pressure if $a = 1, b = -1, c = -2$

    (2) Velocity if $a = 1, b = 0, c = -1$

    (3) Acceleration if $a = 1, b = 1, c = -2$

    (4) Force if $a = 0, b = -1, c = -2$

Questions No. 13 to 15 are of 2 marks each and Questions no. from 16 to 23 are of 3 marks each

13. In the expression $P = El^2 m^{-5}G^{-2}$, E, m, l and G denote energy, mass, angular momentum and gravitational constant, respectively. Show that P is a dimensionless quantity.

14. An artificial satellite is revolving around a planet of mass M and radius R, in a circular orbit of radius r. From Kepler's Third law about the period of a satellite around a common central body, square of the period of revolution T is proportional to the cube of the radius of the orbit r. Show using dimensional analysis, that

$T = \frac{k}{R}\sqrt{\frac{r^3}{g}}$, where k is a dimensionless constant and g is acceleration due to gravity.

15. Write the SI units of following quantities.

Gravitational constant, Refractive index, Solar constant, Electric current

16. The volume of a liquid flowing out per second of a pipe of length l and radius r is written by a student as

$v = \frac{\pi}{8}\frac{Pr^4}{\eta l}$ where P is the pressure difference between the two ends of the pipe and η is coefficient of viscosity of the liquid having dimensional formula $ML^{-1}T^{-1}$. Check whether the equation is dimensionally correct.

17. Einstein's mass-energy relation emerging out of his famous theory of relativity relates mass (m) to energy (E) as $E = mc^2$, where c is speed of light in vacuum. At the nuclear level, the magnitudes of energy are very small. The energy at nuclear level is usually measured in MeV, where 1 MeV = 1.6×10^{-13} J; the masses are measured in unified atomic mass unit (u) where $1u = 1.67 \times 10^{-27}$ kg.

    (a) Show that the energy equivalent of $1u$ is 931.5 MeV.

    (b) A student writes the relation as $1u$ = 931.5 MeV. The teacher points out that the relation is dimensionally incorrect. Write the correct relation.

18. (i) Find the dimensions of $\left(\frac{a}{b}\right)$ in the equation $P = \frac{a - t^2}{bx}$ where P is pressure, x is distance and t is time.

    (ii) Discuss the advantages and two limitations of using dimensional method.

19. Discuss the various errors normally associated with a measurement, and also the ways to reduce them.

20. (i) How many significant figures are there in the following measurements?

    (a) 10.163 (b) 1.67×10^{-17} (c) 0.270 (d) 1.496 (e) 15000 (f) 2.4300 (g) 0.001040

    (ii) Round off the following numbers to three significant figures.

    (a) 3.264 (b) 0.9462 (c) 1.667 (d) 1.285 (e) 45.875

21. Define least count of an instrument. What does the least count error indicate?

22. Time for 20 oscillations of a pendulum is measured at t_1 = 39.6 s; t_2 = 39.9 s; t_3 = 39.5 s. What is the precision in the measurements? What is the accuracy of the measurement?

Numerical Value Based Questions

26. The density of wood is 0.5 in C.G.S. system of units. The corresponding value in M.K.S. unit is _____ .

27. To determine the Young's modulus of a wire, the formula is $Y = \frac{F}{A} \times \frac{L}{\Delta L}$; where L = length; A = area of cross-section of the wire, ΔL = change in length of the wire when stretched with a force F. The conversion factor to change it from CGS to MKS system is n. The value of n is _____ .

28. The least count of a stop watch is $\frac{1}{5}$ s. The time of 20 oscillations of a pendulum is measured as 25 s. The percentage error in the measurement of time will be n. The value of n is _____ .

29. A student performs experiment with simple pendulum and measures time for 10 vibrations. If he measures a time for 100 vibrations, the relative error in measurements of time period will be reduced by n%. The value of n is _____ .

30. The number of significant figures in $(3.20 + 4.80) \times 10^5$ is _____ .

Previous Years Questions

[Dimensional Analysis]

31. The density of a material in SI units is 128 kg m^{-3}. In certain units in which the unit of length is 25 cm and the unit of mass is 50 g, the numerical value of density of the material is **[JEE (Main)-2019]**

(1) 640 (2) 410

(3) 40 (4) 16

32. If velocity [V], time [T] and force [F] are chosen as the base quantities, the dimensions of the mass will be: **[JEE (Main)-2021]**

(1) $[FT^{-1}V^{-1}]$ (2) $[FVT^{-1}]$

(3) $[FT^2V]$ (4) $[FTV^{-1}]$

33. The SI unit of a physical quantity is pascal-second. The dimensional formula of this quantity will be : **[JEE (Main)-2022]**

(1) $[ML^{-1}T^{-1}]$

(2) $[ML^{-1}T^{-2}]$

(3) $[ML^2T^{-1}]$

(4) $[M^{-1}L^3T^0]$

34. Expression for time in terms of G (universal gravitational constant), h (Planck constant) and c (speed of light) is proportional to **[JEE (Main)-2019]**

(1) $\sqrt{\frac{Gh}{c^5}}$ (2) $\sqrt{\frac{c^3}{Gh}}$

(3) $\sqrt{\frac{Gh}{c^3}}$ (4) $\sqrt{\frac{hc^5}{G}}$

35. If speed (V), acceleration (A) and force (F) are considered as fundamental units, the dimension of Young's modulus will be **[JEE (Main)-2019]**

(1) $V^{-2}A^2F^{-2}$ (2) $V^{-2}A^2F^2$

(3) $V^{-4}A^2F$ (4) $V^{-4}A^{-2}F$

36. A quantity f is given by $f = \sqrt{\frac{hc^5}{G}}$ where c is speed of light, G universal gravitational constant and h is the Planck's constant. Dimension of f is that of **[JEE (Main)-2020]**

(1) Energy (2) Area

(3) Volume (4) Momentum

37. If speed V, area A and force F are chosen as fundamental units, then the dimension of Young's modulus will be **[JEE (Main)-2020]**

(1) $FA^{-1}V^0$ (2) FA^2V^{-1}

(3) FA^2V^{-2} (4) FA^2V^{-3}

38. If momentum (P), area (A) and time (T) are taken to be the fundamental quantities then the dimensional formula for energy is **[JEE (Main)-2020]**

(1) $\left[P^{\frac{1}{2}}AT^{-1}\right]$ (2) $[P^2AT^{-2}]$

(3) $\left[PA^{\frac{1}{2}}T^{-1}\right]$ (4) $[PA^{-1}T^{-2}]$

39. If e is the electronic charge, c is the speed of light in free space and h is Planck's constant, the quantity $\frac{1}{4\pi\varepsilon_0}\frac{|e|^2}{hc}$ has dimensions of : **[JEE (Main)-2021]**

(1) $[MLT^{-1}]$ (2) $[MLT^0]$

(3) $[LC^{-1}]$ (4) $[M^0L^0T^0]$

Maths

Section A

1. Let U be the universal containing 700 elements. If A and B are subsets of U such that n(A) = 200, n(B) = 300 and $n(A \cap B) = 100$then $n(A' \cap B') = \ldots$.
   a. 400
   b. 300
   c. 500
   d. 800
2. If A = { 1,2,3,4 } , B = { 4,5,6,7 } ,$A \cap B =$
   a. { 4 }
   b. { 1,2,3,4 }
   c. { 6 , 7 }.
   d. { 1, 2 }
3. If n (A) =3 and n (B) = 6 and A$\subseteq$ B , then $n(A \cup B) =$?
   a. 9
   b. 3
   c. 6
   d. none of these
4. The number of proper subsets of the set { 1, 2 , 3 } is :
   a. 6
   b. 7
   c. 8
   d. 5
5. If A class has 175 students . The following data shows the number of students offering one or more subjects. Mathematics 100 ; Physics 70 ; Chemistry 40 ; Mathematics and Physics 30 ; Mathematics and Chemistry 28 ; Physics and Chemistry 23 ; Mathematics , Physics and Chemistry 18 . How many students have offered Mathematics alone?
   a. 35
   b. 22.
   c. 48
   d. 60
6. Fill in the blanks:

   If A = {1, 3, 5, 7, 9} and B = {2, 3, 5, 7, 11}, then AΔB is _____.
7. Fill in the blanks:

   A set, consisting of a single element, is called a _____.
8. List all the elements of set {x : x is a month of a year not having 31 days}.
9. State whether the statement is true or false: {a, e, i, o, u) and {a, b, c, d} are disjoint sets.
10. If U = {a, b, c, d, e, f, g, h}, find the complement of the set: D = {f, g, h, a}
11. Let A = {1, 2, 4, 5} B = {2, 3, 5, 6} C = {4, 5, 6, 7}. Verify:
    $A - (B \cup C) = (A - B) \cap (A - C)$
12. If A is any set, prove that: $A \subseteq \phi \Leftrightarrow A = \phi$

13. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers.
Find: the number of people who read at least one of the newspaper.

14. For any two sets A and B prove that: $P(A \cap B) = P(A) \cap P(B)$.

15. If U = {a, b, c, d, e, f} , A = {a, b,c}, B = {c, d, e, f} , C = {c, d, e} and D = {d, e, f}, then tabulate the following sets:

i. $A \cap D$
ii. $A \cap C$
iii. $U \cap D$
iv. $A \cup \phi$
v. $(U \cap \phi)'$
vi. $(U \cup A)'$

Chemistry

Some Basic Concepts of Chemistry

Practice Question / Holiday Home work

JEE Main

1. The molarity of a solution obtained by mixing 750 mL of 0.5 (M) HCl with 250 mL of 2(M) HCl will be **[2013]**
(A) 0.875 M (B) 1.00 M (C) 1.75 M (D) 0.0975 M

2. The density of 3 M solution of sodium chloride is 1.252 g mL^{-1}. The molality of the solution will be (molar mass, NaCl = 58.5 g mol^{-1}) **[2013]**
(A) 2.60 m (B) 2.18 m (C) 2.79 m (D) 3.00 m

3. Number of atoms in the following samples of subtances is the largest in : **[2013]**
(A) 4.0g of hydrogen (B) 71.0g of chlorine
(C) 127.0g of iodine (D) 48.0g of magnesium

4. 10mL of 2(M) NaOH solution is added to 200mL of 0.5(M) of NaOH solution. What is the final concentration? **[2013]**
(A) 0.57(M) (B) 5.7(M) (C) 11.4(M) (D) 1.14(M)

5. Experimentally it was found that a metal oxide has formula $M_{0.98}O$. Metal M, present as M^{2+} and M^{3+} in its oxide. Fraction of the metal which exists as M^{3+} would be: **[2013]**
(A) 7.01% (B) 4.08% (C) 6.05% (D) 5.08%

6. The ratio of masses of oxygen and nitrogen of a particular gaseous mixture is 1 : 4. The ratio of number of their molecule is **[2014]**
(A) 1 : 4 (B) 7 : 32 (C) 1 : 8 (D) 3 : 16

7. The amount of $BaSO_4$ formed upon mixing 100 mL of 20.8% w/v $BaCl_2$ solution with 50ml of 9.8% w/v H_2SO_4 solution will be : (Ba = 137, CI = 35.5, S = 32, H = 1 and O=16) **[2014]**
(A) 23.3 g (B) 11.65 g (C) 30.6 g (D) 33.2 g

8. The amount of oxygen in 3.6 moles of water is **[2014]**
(A) 115.2 g (B) 57.6 g (C) 28.8 g (D) 18.4 g

9. Dissolving 120 g of a compound of (mol wt. 60) in 1000 g of water gave a solution of density 1.12 g/mL. The molarity of the solution is **[2014]**
(A) 1.00 M (B) 2.00 M (C) 2.50 M (D) 4.00 M

10. A sample of a hydrate of barium chloride weighing 61 g was heated until all the water of hydration is removed. The dried sample weighed 52 g. The formula of the hydrated salt is: (atomic mass, Ba = 137 amu, Cl = 35.5 amu) **[2015]**
(A) $BaCl_2.H_2O$ (B) $BaCl_2.2H_2O$ (C) $BaCl_2.3H_2O$ (D) $BaCl_2.4H_2O$

11. $A + 2B + 3C \text{ —o } AB_2C_3$
Reaction of 6.0 g of A, 6.0 υ 10^{23} atoms of B, and 0.036 mol of C yields 4.8 g of compound AB_2C_3. If the atomic mass of A and C are 60 and 80 amu, respectively, the atomic mass of B is (Avogadro no. = 6 υ 10^{23}): **[2015]**
(A) 70 amu (B) 60 amu (C) 50 amu (D) 40 amu

12. An organic compound contains C, H and S. The minimum molecular weight of the compound containing 8% sulphur is :
(atomic weight of S = 32 amu) **[2016]**
(A) 200 g mol^{-1} (B) 400 g mol^{-1} (C) 600 g mol^{-1} (D) 300 g mol^{-1}

13. Choose the incorrect formula out of the four compounds for an element X below: **[2016]**
(A) X_2Cl_3 (B) X_2O_3 (C) $X_2(SO_4)_3$ (D) XPO_4

14. The amount of arsenic pentasulphide that can be obtained when 35.5 g arsenic acid is treated with excess H_2S in the presence of conc. HCl (assuming 100% conversion) is: **[2016]**
(A) 0.50 mol (B) 0.25 mol (C) 0.125 mol (D) 0.333 mol

15. 1 gram of a carbonate (M_2CO_3) on treatment with excess HCl produces 0.01186 mole of CO_2. The molar mass of M_2CO_3 in g mol^{-1} is : **[2017]**
(A) 84.3 (B) 118.6 (C) 11.86 (D) 1186

16. Excess of NaOH (aq) was added to 100 mL of $FeCl_3$ (aq) resulting into 2.14 g of $Fe(OH)_3$ The molarity of $FeCl_3$ (aq) is : **[2017]**
(Given molar mass of Fe = 56 g mol^{-1} and molar mass of Cl = 36.5 g mol^{-1})
(A) 0.2 M (B) 0.3 M (C) 0.6 M (D) 1.8 M

17. What quantity (in mL) of a 45% acid solution of a mono-protic strong acid must be mixed with a 20% solution of the same acid to produce 800 mL of a 29.875% acid solution? **[2017]**
(A) 320 (B) 325 (C) 316 (D) 330

18. The most abundant elements by mass in the body of a healthy human adult are : Oxygen (61.4%); Carbon (22.9%), Hydrogen (10.0%) ; and Nitrogen (2.6%). The weight which a 75 kg person would gain if all ^1H atoms are replaced by ^2H atoms is : **[2017]**
(A) 37.5 kg (B) 7.5 kg (C) 10 kg (D) 15 kg

19. The ratio mass percent of C and H of an organic compound ($C_XH_YO_Z$) is 6 : 1. If one molecule of the above compound ($C_XH_YO_Z$) contains half as much oxygen as required to burn one molecule of compound C_XH_Y completely to CO_2 and H_2O. The empirical formula of Compound $C_XH_YO_Z$ is : **[2018]**
(A) C_2H_4O (B) $C_3H_4O_2$ (C) $C_2H_4O_3$ (D) $C_3H_6O_3$

20. What would be the molality of 20% (mass/mass) aqueous solution of KI? **[2019]**
(molar mass of KI = 166 g mol^{-1})
(A) 1.35 (B) 1.51 (C) 1.08 (D) 1.48

21. The mole fraction of a solvent in aqueous solution of a solute is 0.8. The molality (in mol kg^{-1}) **[2019]**

(A) 13.88×10^{-3} (B) 13.88×10^{-1} (C) 13.88 (D) 13.88×10^{-2}

JEE ADVANCE

22. Given that the abundances of isotopes ^{54}Fe, ^{56}Fe and ^{57}Fe are 5%, 90% and 5%, respectively, the atomic mass of Fe is **[2008]**

(A) 55.85 (B) 55.95 (C) 55.75 (D) 56.05

23. A student performs a titration with different burettes and finds titre values of 25.2 mL, 25.25mL, and 25.0mL. The number of significant figures in the average titre value is **[2010]**

24. Silver (atomic weight = 108 g mol^{-1}) has a density of 10.5g cm^{3}.The number of silver atoms on a surface of area $10^{12} m^2$ can be expressed in scientific notation as $y \cup 10^{x}$. The value of x is: **[2010]**

25. Dissolving 120 g of urea (mol. wt. 60) in 1000 g of water gave a solution of density 1.15 g/mL. The molarlity of the solution is **[2011]**

(A) 1.78 M (B) 2.00 M (C) 2.05 M (D) 2.22 M

26. 29.2% (w/w) HCl stock solution has a density of 1.25 gmL^{-1}. The molecular weight of HCl is 36.5 g mol^{-1}. The volume (mL) of stock solution required to prepare a 200 mL solution of 0.4 M HCl is **[2012]**

27. A compound H_2X with molar weight of 80g is dissolved in a solvent having density of 0.4 g ml^{-1}. Assuming no change in volume upon dissolution, the molality of a 3.2 molar solution is **[2014]**

28. If the value of Avogadro number is 6.023×10^{23} mol^{-1} and the value of Bolltzmann constant is 1.380×10^{-23} J K^{-1}, then the number of significant digits in the calculated value of the universal gas constant is **[2014]**

29. The mole fraction of a solute in a solution is 0.1. At 298 K, molarity of this solution is the same as its molality. Density of this solution at 298 K is 2.0 g cm^{-3}. The ratio of the molecular weight of the solute and solvent, $\left(\frac{MW_{solute}}{MW_{solvent}}\right)$, is **[2016]**

30. The mole fraction of urea in an aqueous urea solution containing 900 g of water is 0.05. If the density of the solution is 1.2 g cm^{-3}, the molarity of urea solution is _____ **[2019]**
(Given data : Molar masses of urea and water are 60 g mol^{-1} and 18 g mol^{-1}, respectively)

EXERCISE – 3

1.	(A)	2.	(C)	3.	(A)	4.	(A)	5.	(B)
6.	(B)	7.	(B)	8.	(B)	9.	(B)	10.	(B)
11.	(C)	12.	(B)	13.	(A)	14.	(C)	15.	(A)
16.	(A)	17.	(A)	18.	(B)	19.	(C)	20.	(B)
21.	(C)	22.	(B)	23.	(3)	24.	(7)	25.	(C)
26.	(8)	27.	(8)	28.	(4)	29.	(9)		
30.	(2.98 or 2.99)								