Model Question Paper

आदर्श प्रश्न पत्र

Class-X

कक्षा दसवीं

Science & Technology

विज्ञान और प्रौधोगिकी

(2025-2026)

Time 3Hr. **MM : 60**

समय : 3 घण्टे **अधिकतम अंक : 60**

General Instructions:

सामन्य निर्देशः

(i) All questions are compulsory.
सभी प्रश्न अनिवार्य है।

(ii) Section-A: Question number 1 to 12 are objective type questions of one mark each.
भाग–कः प्रश्न संख्या 1–12 वस्तुनिष्ठ प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है।

(iii) Section-B: Question number 13 to 21 are of very short answer type questions and each question is of 2 marks.
भाग–खः प्रश्न संख्या 13–21 अति लघुउत्तरीय प्रश्न है और प्रत्येक प्रश्न 2 अंक का है।

(iv) Section-C: Question number 22 to 26 are short answer type questions and each question is of 3 marks.
भाग–गः प्रश्न संख्या 22–26 लघुउत्तरीय प्रश्न है और प्रत्येक प्रश्न 3 अंक का है।

(v) Section-D: Question no 27-29 are very long answer type question. All questions are compulsory and of 5 marks each.
भाग–घः प्रश्न संख्या 27–29 अति दीर्घउत्तरीय प्रश्न है। सभी प्रश्न अनिवार्य है और प्रत्येक प्रश्न 5 अंक का है।

(vi) Draw labelled diagram in support of your answer wherever necessary.
जहां आवश्यक हो, अपने उत्तर के साथ नामांकित चित्र भी बनाईए।

Section –A

भाग–क

Q1 A student performs an experiment to form aluminium chloride from aluminium and chlorine. Which of the following option gives the chemical equation of the reaction? (1)

(a) $Al + Cl_2 \longrightarrow -AlCl_2$ (b) $2Al + Cl_2 \longrightarrow 2AlCl$

(c) $2Al + 3Cl_2 \longrightarrow 2AlCl_3$ (d) $3Al + 3Cl_2 \longrightarrow 3AlCl_3$

एक छात्र एल्यूमीनियम और क्लोरीन से एल्यूमीनियम क्लोराइड बनाने के लिए एक प्रयोग करता है। निम्न में से कौन सा विकल्प इस रासायनिक अभिक्रिया के रासायनिक समीकरण को प्रदर्शित करता है।

(a) $Al + Cl_2 \longrightarrow -AlCl_2$ (b) $2Al + Cl_2 \longrightarrow 2AlCl$

(c) $2Al + 3Cl_2 \longrightarrow 2AlCl_3$ (d) $3Al + 3Cl_2 \longrightarrow 3AlCl_3$

Q.2 Lactic Acid is present in (1)

(a) Orange. (b) Tea (c) Curd. (d) Vinegar

लैक्टिक अम्ल किसमें पाया जाता है।

(a) संतरा (b) चाय (c) दहीं (d) सिरका

Q.3 A non-metal used to preserve food material is: (1)

a) Carbon. b) Phosphorus c) Sulphur. d) Nitrogen

खाद्य पदार्थो को परिरक्षित करने के लिए किस अधातु का प्रयोग किया जाता है?

(a) कार्बन (b) फॉसफोरस (c) सल्फर (d) नाईट्रोजन

Q.4) A carbon compound contains two atoms of carbon. Which name should the carbon compound bear? (1)

(a) Butane. (b) Ethane (c) Methane d) Propane

एक कार्बनिक योगिक में कार्बन के दो परमाणु है। कार्बनिक योगिक का नाम क्या हो सकता है?

(a) ब्युटेन (b) एथेन (c) मिथेन (d) प्रोपेन

Q.5 Which statement is true for the reflection of light? (1)

(a) The angle of incidence and reflection are equal.

(b) The reflected light is less bright than the incident light.

(c) The sum of the angle of incidence and reflection is always greater than 90°.

(d) The beams of the incident light, after reflection, diverge at unequal angles.

प्रकाश के परावर्तन के बारे में निम्न में से कौन सा कथन सत्य है ?

(a) आपतन कोण, परावर्तन कोण के बराबर होता है

(b) परावर्तित प्रकाश, आपतित प्रकाश से कम चमकीला होता है

(c) आपतन और परावर्तन कोण का योग 90^0 से अधिक होता है

(d) आपतित प्रकाश किरण परावर्तन के बाद असमान कोणो पर अपसरित होती है

Q.6 In which part of the human eye is the image of an object formed? (1)

(a) Iris (b) Pupil (c) Retina (d) Cornea

मानव नेत्र में किस भाग पर वस्तु का प्रतिबिम्व बनता है ?

(a) परितारिका (b) पुतली (c) दृष्टिपटल (d) स्वच्छ मंडल

Q.7 Electrical resistivity of a given metallic wire depends upon (1)

(a) Its length (b) Its thickness (c) Its shape (d) Nature of the material

किसी धातु की तार की विद्युत प्रतिरोधकता किस गुण पर निर्भर करती है?

(a) लंबाई (b) मोटाई (c) आकार (d) पदार्थ की प्रकृति

Q.8 An electric bulb is rated 220 V and 100 W. When it is operated on 110 V. the power consumed will be - (1)

(a) 100 W (b) 75 W (c) 50 W (d) 25 W

किसी विद्युत बल्ब का अनुमतांक 220V और 100W है। जब इसे 110V पर प्रचलित करते हैं तब इसके द्वारा प्रयुक्त शक्ति कितनी होती है?

(a) 100 W (b) 75 W (c) 50 W (d) 25 W

Q.9 In amoeba, food is digested in the: (1)

(a) Food vacuole (b) Mitochondria (c) Pseudopodia (d) Chloroplast

अमीबा में भोजन का पाचन किसमें होता है?

(a) खाद्य धानी (b) माइटोकॉन्ड्रिया (c) कूटपाद (d) क्लोरोप्लास्ट

Q.10 The gap between two neurons is called a (1)

(a) dendrite. (b) synapse. (c) axon. (d) impulse.

दो तंत्रिका कोशिकाओं के मध्य खाली स्थान को कहते हैं?

(a) द्रुमिका (b) सिनेप्स (c) एक्सॉन (d) आवेग

Q.11 The anther contains (1)

(a) sepals. (b) ovules. (c) pistil. (d) pollen grains

परागकोश में होते हैं

(a) बाह्मदल (b) बीजांड (c) स्त्रीकेसर (d) परागकण

Q.12The amount of energy that flows from one trophic level to another in a food chain is (1)

a) 5% b) 10% c) 20% d) 15%

किसी खाद्य श्रृंखला में एक पोषी स्तर से दूसरे पोषी स्तर तक प्रवाहित होने वाली ऊर्जा की मात्रा है–

a) 5% b) 10% c) 20% d) 15%

Section B
भाग–ख

Q13. Why should a magnesium ribbon be cleaned before burning in air? (2)
वायु में जलाने से पहले मैग्नीशियम रिबन को साफ क्यों किया जाता है?

Q.14 While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid? (2)
अम्ल को तनुकृत करते समय यह क्यों अनुशंसित करते हैं, कि अम्ल को जल में मिलाना चाहिए, न कि जल को अम्ल में?

Q.15 A mixture of oxygen and ethyne is used for welding. Can you tell why a mixture of ethyne and air is not used? (2)
वेल्डिंग करने के लिए ऑक्सीजन और एथाइन का मिश्रण उपयोग किया जाता है। क्या आप बता सकते हैं कि एथाइन और वायु का मिश्रण क्यों उपयोग नहीं किया जाता?

Q.16 Why do we prefer a convex mirror is used as rear view mirror in vehicles? (2)
हम वाहनों में उत्तल दर्पण को पश्च दृश्य दर्पण के रूप में वरीयता क्यों देते हैं?

Q.17 Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass? The Speed of light in vacuum is $3x10^8$ ms-1. (2)
प्रकाश वायु से 1.50 अपवर्तनांक के कांच में प्रवेश करता है। कांच में प्रकाश की चाल क्या है? निर्वात में प्रकाश की चाल $3x10^8$ ms-1.है?

Q.18 Why is normal eye not able to see clearly the objects placed closer than 25 cm? (2)
सामान्य नेत्र 25cm से निकट रखी वस्तुओं को सुस्पष्ट क्यों नहीं देख पाते?

Q.19 Why is diffusion insufficient to meet the oxygen requirements of multicellular organisms like humans? (2)
हमारे जैसे बहुकोशिकीय जीवों में ऑक्सीजन की आवश्यकता पूरी करने में विसरण क्यों अपर्याप्त है?

Q.20 How is the movement of leaves of the sensitive plant different from the movement of shoot towards light? (2)
छुई–मुई पादप की पत्तियों की गति, प्रकाश की ओर प्ररोह की गति से किस प्रकार भिन्न है?

Q.21 What is the purpose of making urine in the human body? Name the organ that stores and release the urine? (2)
मानव शरीर में मूत्र बनने का क्या उद्देश्य है? उस अंग का नाम बताओ जो मूत्र को संग्रहित करता है और मूत्र को निष्कासित करता है?

OR

Which hormone is present in the areas of rapid cell division in a plant and which hormone inhibits growth? (2)
पौधों में तीव्र कोशिका विभाजन वाले क्षेत्रों में कौन सा हार्मोन पाया जाता है और कौन सा हार्मोन वृद्धि का संदमन करता है?

Section-C

भाग–ग

Q.22 The following questions consist of two statements assertion-A and reason -R Answer these questions selecting the appropriate option given in below

a) both A and R are true and R is 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

नीचे दिये गये प्रश्नों में दो कथन अभिकथन-A और कारण-R दिए गए हैं। नीचे दिए गए उचित विकल्प का चयन करके इन प्रश्नों के उत्तर दीजिए–

(a) A और R दोनों सत्य हैं और R, A का सही स्पष्टीकरण है
(b) A और R दोनों सत्य हैं और R, A का सही स्पष्टीकरण नहीं है
(c) A सत्य है, परन्तु R असत्य है
(d) A असत्य है, परन्तु R सत्य है

(i) Assertion: Rusting of iron is endothermic in nature (1)
Reason : As the reaction is slow the release of heat is barely evident.
अभिकथन- A : लोहे में जंग लगना एक ऊष्माशोषी प्रकृति की अभिक्रिया है।
कारण - R : क्योंकि यह एक धीमी प्रक्रिया है इसलिए हमें ऊष्मा उत्पन्न होते हुए दिखाई नहीं देती।

(ii) Assertion: A compass needle is placed near a current carrying wire the deflection of the compass needle decreases when the magnitude of the current in the wire is increased (1)
Reason :The strength of magnetic field at a point near the conductor increases on increasing the current.
अभिकथन- A : एक दिशासूचक सूई को एक विद्युत धारावाही चालक के पास रखा गया है। विद्युत धारा का परिणाम बढ़ने पर दिशासूचक सूई का विक्षेपण कम हो जाता है।
कारण - R : विद्युत धारा का परिमाण बढ़ने पर चालक के निकट स्थित एक बिन्दू पर चुंबकीय क्षेत्र की शक्ति बढ़ जाती है।

(iii) Assertion: The use of chemical like CFCs has endangered the ozone layer
Reason: Since the ozone layer protect against the ultraviolet radiations from the sun, this could damage the environment. (1)
अभिकथन- A : CFC जैसे रसायनों के उपयोग के कारण ओजोन परत के लिए खतरा उत्पन्न हो गया है।
कारण - R : क्योंकि ओजोन परत सूर्य से आने वाली हानिकारक पराबैंगनी विकिरणों से सुरक्षा करती है, इसलिए इससे पर्यावरण को नुकसान पहुच सकता है।

Q.23 The refractive indices of three media are given below: (1+2=3)

Medium	Refractive index
A	1.6
B	1.8
C	1.5

A ray of light is travelling from A to B and another ray is travelling from B to C.
(a) In which of the two cases the refracted ray bends towards the normal?
(b) In which case does the speed of light increase in the second medium?
Also give reasons for your answer.

तीन माध्यमों के अपवर्त्तनांक नीचे दिए गए है

माध्यम	अपवर्त्तनांक
A	1.6
B	1.8
C	1.5

एक प्रकाश किरण माध्यम A से B में जा रही है तथा एक अन्य प्रकाश किरण माध्यम B से C में जा रही है।
(a) दोनों में से किस स्थिति में अपवर्तित किरण अभिलंब की ओर मुड़ेगी?
(b) दोनों में से किस स्थिति में दूसरे माध्यम में जाने पर प्रकाश की चाल बढ़ जाएगी?

OR

Why is tungsten used almost exclusively for filament of electric lamps? (3)
विद्युत लैम्पों के तंतुओं के निर्माण में प्रायः एकमात्र टंगस्टन का ही उपयोग क्यों किया जाता है?

Q.24 A solution of a substance X is used for whitewashing. (1+2=3)
(a) Name the substance X and write it's formula?
(b) write the reaction of the substance 'X' named in (a) above with water.
किसी पदार्थ X के विलयन का उपयोग सफेदी करने के लिए होता है।
(a) पदार्थ X का नाम तथा इसका सूत्र लिखिए।
(b) ऊपर (a) में लिखे पदार्थ X की जल के साथ अभिक्रिया लिखिए।

OR

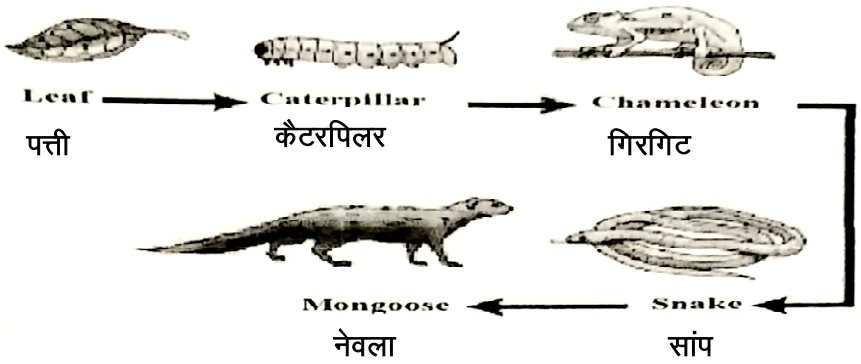
What are two properties of Carbon which lead to the large number of carbon Compounds we see around us? (3)
कार्बन के दो गुणधर्म कौन से हैं, जिनके कारण हमारे चारों ओर कार्बन यौगिकों की विशाल संख्या दिखाई देती है?

Q.25 The sex of new born child is a matter of chance and none of the parents may be considered responsible for it. Justify this statement with the help of flow chart showing sex determination in human beings. (3)
नवजात शिशु का लिंग निर्धारण संयोग की बात है और इसके लिए माता–पिता में से किसी को भी जिम्मेदार नहीं माना जा सकता। मानव में लिंग निर्धारण को दर्शाने वाले फ्लो–चार्ट की सहायमता से इस कथन की पुष्टि करें।

OR

Differentiate between external- fertilization and internal fertilization. (3)
बाह्य निषेचन और आंतरिक निषेचन में अंतर स्पष्ट करें।

Q.26 Study the food chain given below and answer the questions that follow: (1+2=3)
नीचे दी गई खाद्य श्रृंखला का अध्ययन करें और उसके नीचे दिए गए प्रश्नों के उत्तर लिखें–



(a) If the amount of energy available at the third trophic level is 100 Joules, then how much energy will be available at producer level? Justify your answer.
यदि तीसरे पोषी स्तर पर 100 जूल ऊर्जा उपलब्ध है, तो उत्पादक स्तर पर कितनी ऊर्जा उपलबध होगी? अपने उत्तर की पुष्टी करें।

(b) Is it passible to have 2 more trophic levels in this food chain just before the Fourth trophic level? Justify your answer.
क्या दी गई खाद्य श्रृंखला में चौथे पोषी स्तर से पहले दो और पोषी स्तर हो सकते हैं? अपने उत्तर की पुष्टि करें।

Section-D

भाग–घ

Q.27 What is corrosion? What are essential conditions for corrosion? Write different methods to prevent corrosion. (5)
संक्षारण क्या है? संक्षारण के लिए आवश्यक परिस्थितियां क्या है? संक्षारण को रोकने के विभिन्न तरीके लिखिए।

OR

Define the following teams. (1+1+1+1+1=5)
(a) Mineral. (b) Ore (c) Gangue (d) Rancidity. (e) Precipitate.
निम्न पदों की परिभाषा लिखिए–
(a) खनिज (b) अयस्क (c) गैंग (d) विकृतगंधिता (e) अवक्षेप

Q.28 A concave lens has focal length of 15 cm. At what distance should the object from the lens be placed so that it forms an image at 10 cm from the lens? Also, find the magnification produced by the lens. (5)
किसी अवतल लेंस की फोकस दूरी 15 cm है। बिंब को लेंस से कितनी दूरी पर रखें कि इसके द्वारा बिंब का लेंस से 10 cm दूरी पर प्रतिबिंब बने? लेंस द्वारा उत्पन्न आवर्धन भी ज्ञात कीजिए।

OR

a) Draw magnetic field lines around a bar magnet.
b) Why don't two magnetic field lines intersect each other? (2+3)
(a) किसी छड़ चुंबक के चारों ओर चुंबकीय क्षेत्र रेखाए खींचिए।
(b) दो चुंबकीय क्षेत्र रेखाएं एक दूसरे को प्रतिच्छेद क्यों नहीं करतीं?

Q.29 Explain the process of excretion in human beings with well labelled diagram. (5)
मानव में उत्सर्जन की प्रक्रिया का नामांकित चित्र सहित वर्णन कीजिए।

OR

a) A Doctor has advised Sameer to reduce sugar in take in his diet and do regular exercise after checking his blood test report. Which disease do you think Sameer is suffering from? Name the hormone responsible for this disease and the organ producing the hormone ? (3)
b) If a woman is using a copper-T, will it help her in protecting her from sexually transmitted diseases? (2)
(a) डॉक्टर ने रक्त परीक्षण की रिपोर्ट देखने के बाद समीर को आहार में चीनी (शर्करा) का सेवन कम करने तथा नियमित व्यायाम रने की सलाह दी है। आपको क्या लगता है, कि समीर किसी बीमारी से पीड़ित है? इस बीमारी के लिए जिम्मेदार हार्मोन का नाम और उस हार्मोन का उत्पादन करने वाले अंग (ग्रंथि) का नाम बताइए।
(b) यदि कोई महिला कॉपर–टी का प्रयोग कर रही है तो क्या यह उसकी यौन संचारित रोगों से रक्षा करेगा?

Distribution of Marks and Blue Print
Division of Marks

Sr. No.	Type of Questions	Marks allotted	No. Of Questions	Total Marks
1	Objective type	1	12	12
2	Very Short Answer	2	9	18
3	Short Answer	3	5	15
4	Long Answer	5	3	15
	Total	-	29	60

Distribution

Unit No.	Unit	Chapters Covered	Marks
I	Chemical Substances Nature and behaviour.	Chapter- 1: Chemical reaction and equations. Chapter-2: Acids, Bases and Salts Chapter-3: Metals and Non-Metals Chapter-4: Carbon and its compounds.	19
II	Work of living	Chapter- 5: Life processes Chapter-6: Control and coordination Chapter-7: How to organisms reproduce? Chapter-8: Heredity.	19
III	Natural Phenomena and effects of current	Chapter- 9: Light-Reflection and refraction. Chapter-10: The human eye and the colourful world. Chapter-11: Electricity Chapter-12: Magnetic effects of electric current.	18
IV	Natural Resources	Chapter-13: Our Environment	4
		Total Marks	60

Unit-I Chemical Substances, Nature and behaviour.

Questions	Marks
4 Questions (MCQ)	4 Marks
1 Question (Assertion-reason)	1 Mark
3 Questions (Very short answer)	6 Marks
1 Question (Short answer)	3 Marks
1 Question (long answer)	5 Marks
10 Questions	19 Marks

Chapter-1 chemical reactions and equation:-

Chemical equations, balanced chemical equation, types of chemical equations- combination. Decomposition, displacement double displacement, precipitation, endothermic, exothermic and redox(oxidation-reduction)reactions. Effect of oxidation and reduction reactions in everyday life- corrosion and rancidity.

Chapter-2: Acid, bases and salts:-

Chemical properties of acids and bases, concept of ph scale, Importance of ph in everyday life, Chemicals from common salt, Preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and plaster of paris. Concept of water of crystallisation.

Chapter-3: Metals and Non-Metals :-

Physical and chemical properties of metals and Non-Metals. Reactivity series. Formation and properties of ionic compounds, Basic metallurgical process, corrosion and its prevention.

Chapter-4: Carbon- compounds:-

Covalent bonding, Versatile nature of carbon, Saturated and Unsaturated. Carbon compounds, Nomenclature of carbon compounds, Chemical properties of carbon compounds, Ethanol and Ethanoic acid (properties and uses), Soaps and detergents, Cleaning action of soaps(Micelles formation).

Unit-II: World of Living.

Questions	Marks
4 Questions(MCQ)	04 Marks
1 Question (Assertion-reason)	01 Mark
3 Questions(Very short answers)	06 Marks
1 Question (Short answer)	03 Marks
1 Question (Long answer)	05 Marks
10 Questions	19 Marks

Chapter-5: Life processes:-

Living being. Basic concept of Nutrition. Respiration, Transportation and excretion in Human-beings and Plants.

Chapter-6: Control and Coordination:-

Animal's nervous system, Reflex action, Human Brain, Coordination in plants, Tropic movements in plants, Plant hormones, Hormones in animals.

Chapter-7: How do organisms Reproduce? :-

Different modes of reproduction in plants and animals, Importance of sexual-reproduction, Sexual Reproduction in plants, Reproduction in Human beings, Reproductive Health, Different methods of family planning.

Chapter-8: Heredity :-

Accumulation of variation during reproduction, Heredity, Mendel's contributions rules for inheritance of traits. How do the traits get expressed? Sex determination.

Unit-III : Natural Phenomena and effects of current [18 Marks]

Questions	Marks
3 Questions (MCQ)	3 Marks
1 Question (Assertion-reason)	1 Mark
3 Questions (Very short answer)	6 Marks
1 Question (Short answer)	3 Marks
1 Question (Long answer)	5 Marks
9 Questions	18 Marks

Chapter-9: Light-Reflection and refraction:-

Reflection of light spherical mirrors:- concave and convex, Representation of images formed by mirrors using ray diagrams mirror formula and magnification, refraction of light through glass slab and lenses, Image formation by lenses, Lens formula and magnification, uses of mirrors and lenses power of lens.

Chapter-10: The Human Eye and the colourful world :-

The human Eye, Power of accommodation, defects of vision and their correction, Refraction of light through prism, Dispersion of light, atmosphere Refraction ,Scattering of light.

Chapter-11: Electricity:-

Electric current, electric potential and potential difference, Circuit diagram, Ohm's law, Factors on which the resistance of a conductor depends, Series combination of resistors. Parallel combination of resistors, Heating effects of electric current and its practical applications, Electric Power.

Chapter -12: Magnetic effect of electric current: -

Magnetic field and field lines, Magnetic field due to a current carrying conductor right hand thumb rule, Magnetic field due to a current carrying conductor in a magnetic field, Fleming's left hand rule, Domestic Electric circuits.

Unit IV : Natural Resources [4 Marks]

Questions	Marks
1 Question(MCQ)	1 Mark
1 Question(Short Answer)	3 Marks
2 Questions	04 Marks

Chapter-13: Our Environment:-

Eco-System, Food Chains and webs, Ozone layer and its depletion, Managing the garbage we produce, Biodegradable and non-biodegradable substances.

Model Question Paper Solution

Class-X

Science

Section – A	Marking
Q. 1 - C	01
Q.2 - C	01
Q.3 - D	01
Q.4 - B	01
Q.5 - A	01
Q.6 - C	01
Q.7 - D	01
Q.8 - D	01
Q.9 - A	01
Q.10 - B	01
Q.11 - D	01
Q.12 - B	01
Assertion/Reason	
Q.13 - D	01
Q.14 - D	01
Q.15 - A	01

Section-B

Q.16

{Magnesium is a reactive metal. It combines with oxygen in air to form a layer of magnesium oxide on its surface.} {Hence, it should be cleaned with a sand paper before burning to remove the oxide layer formed on its surface.} | $1+1=2$

Q.17

{The process of adding water to an acid is highly exothermic,} {therefore it is always recommended that acid should be added to water.} {If it is done the other way, then it might be possible that because of the large amount of heat generated, the mixture may splash out and cause burns.} | $0.5+0.5+1=2$

Q.18.

{When ethyne is burnt in air, it gives a sooty flame. This is due to incomplete combustion caused by limited supply of air.} {However, if ethyne is burnt with oxygen, it gives a clean flame with temperature 3000°C because of complete combustion. This oxy-acetylene flame is used for welding.} { It is not possible to attain such a high temperature without mixing oxygen. This is the reason why a mixture of ethyne and air is not used.}

0.5+0.5+1 =2

Q.19

{Convex mirrors are commonly used as rear- view (wing) mirrors in vehicles because they give an erect, virtual, full size diminished image of distant objects with a wider field of view.} {Thus, convex mirrors enable the driver to view much larger area than would be possible with a plane mirror.}

1+1 =2

Q 20

Given That,
Refractive index μ = 1.50
Speed of light c = 3 x 10^8 m/s
We Know that
$n_g = c/v_g$
$v_g = \frac{3 \times 108}{1.50}$
v_g = 2 x 10^8 m/s
Hence the speed of light in glass is 2 x 10^8 m/s

1 + 1 =2

Q.21

{The eye is not able to decrease the focal length beyond a limit. When the eye is focused on a closer object, the ciliary muscles are strained and the focal length of the eye-lens decreases.} {Because of some reason, the eye is not able to decrease the focal length beyond a limit, hence a normal eye is not able to see objects closer than 25 cm.}

1+1 =2

Q.22

{Multicellular organisms such as humans possess complex body designs. They have specialised cells and tissues for performing various necessary functions of the body such as intake of food and oxygen.} {Unlike unicellular organisms, multicellular cells are not in direct contact with the outside environment. Therefore, diffusion cannot meet their oxygen requirements}.

1+1 =2

Q.23

{The movements of the leaves of the sensitive plant are touch-sensitive and independent of growth known as thigmonasty. While the movement of the shoot towards light is growth-} {related and known as phototropism.A plant's response to light is called phototropism. Phototropism occurs in plants when they respond to sunlight.}

1+1 =2

Q.24

{To filter out nitrogenous waste products like urea and uric acid from the blood in humans.}

1+0.5+0.5 =2

{Organ for storage: Urinary Bladder}

{Organ for release: Urethra}

Q.25

{Tungsten has the highest melting point (3695K), lowest vapour pressure and greatest tensile strength among all the metals. It can reach higher temperatures before melting and hence can emit brighter light.} {Also, the light emitted due to heated tungsten lies in the visible spectrum and is yellow in colour which makes it the most preferred material for filament of electric bulbs.}

2 + 1 = 3

Q.26

The two properties of carbon which lead to huge number of compounds:-

(i) Catenation: Catenation means carbon atoms have the tendency to link with one another through covalent bonds to form chains and rings.

2 + 1 = 3

(ii) Tetravalency: The valency of Carbon atom is 4 ,so it capable of bonding with four other atoms of carbon or atoms of some other element.

Q.27

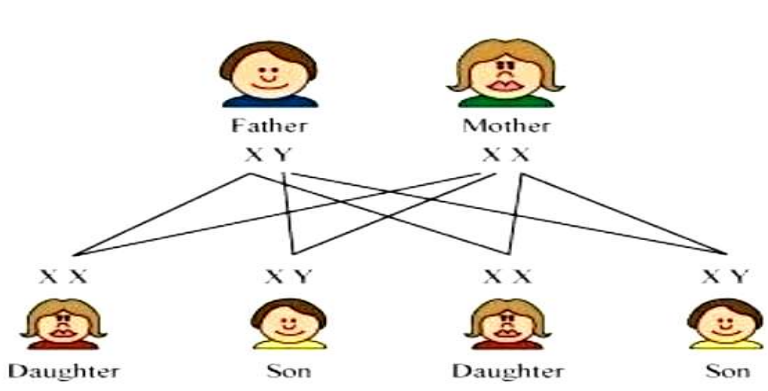
{The sperm has either X or Y chromosome, while the egg has only X chromosome. So, if the sperm carrying Y chromosome fuses with the egg, it results in the formation of a male child; and if the sperm carrying X chromosome fuses with the egg, it results in the formation of a female child.}

1 + 1+ 1 = 3

{Thus, there is an equal chance of fusion of either X or Y chromosome with the egg.

Therefore, we can say that the sex of a newborn child is a matter of chance and none of the parents are responsible for it.}

Sex determination in humans is shown below:-



Q.28

{a) 10000J because only 10% of energy is available for the next trophic level.}

1 + 2 = 3

b) No, since the loss of energy at each step is so great that very little usable energy will remain after 4 trophic level.

Q.29

{Corrosion is the phenomenon of attacking the surface of a metal by air and moisture, so the metal gets corrodes.}

Necessary conditions for corrosion are:

1. Presence of oxygen and air.

2. Presence of water and moisture.

3. Metals placed higher in the activity series.

0.5 + 1.5 + 1 + 1 + 1 = 5

Methods for prevention of corrosion The rusting of iron can be prevented by greasing, painting, galvanizing, anodizing, or oiling the surface. These methods can be classified into the following categories:

1. Galvanization: Galvanized metal is coated with a thin layer of zinc to protect it against corrosion. The zinc oxidizes when it is exposed to air creating a protective coating on the metal surface.

2. Alloying: It is the method of improving the properties of a metal by mixing the metal with another metal or nonmetal. When iron is alloyed with chromium and nickel in stainless steel is obtained. Stainless steel does not rust at all.

3. Painting: Rusting of iron can be easily prevented by coating the surface with paint which protects iron from air and moisture.

Q.30

Given:

Image distance, v = - 10cm Focal length, f = - 15cm [f is-ve for a concave lens]

1 + 2+ 2 = 5

To find: We have to find the object distance, u

Solution:

Using lens formula, 1/v - 1/u = 1/f we have, 1/u = 1/v - 1/f 1 -10 = (- 3 + 2)/30 1 30 So, u = - 30cm 1 -15 =

Thus the object should be placed at a distance of 30cm from the lens on the left side.

We know, Magnification= m = m = - 10/- 30 m = 1/3 m = 0.33(Positive) Thus the image is virtual, erect and diminished.

Hence, The object distance = 30cm Magnification = 3 = 0.33

Q.31

a) Sameer is suffering from diabetes.

The hormone responsible for diabetes is insulin .

The organ producing the hormone is pancreas .

1 + 1+ 1 = 3

b) The hormone present in the area of rapid cell division in a plant is cytokinine and the hormone which inhibits the growth is abscisic acid.

1+1=2

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