GLOBAL TALENT SEARCH EXAMINATION

SCIENCE

Class : X

Max Marks : 80

Time : 11:00 to 12:30 noon

Instructions to Candidates :

01. This question paper has 40 objective questions. In addition to this question paper, you are also given an answer-sheet.
02. Read the instructions carefully for each section before attempting it.
03. For each correct answer **2 marks** will be awarded and there is no negative marking.
04. On the answer-sheet, fill up all the entries carefully in the space provided, **ONLY IN BLOCK CAPITAL LETTERS**.
05. Incomplete / incorrect / carelessly filled information may disqualify your candidature.
06. On the answer-sheet, use **PENCIL / BLUE or BLACK BALL PEN.**
07. No extra sheet will be provided for rough-work. Use the space available in the paper for your rough- work.
08. Use of calculator is not permitted.
09. No student is permitted to leave the examination hall before time is complete.
10. Use of unfair means shall invite cancellation of the test.

Roll No.

Centre No.

Male / Female _____

Name of the candidate : (In English only, as you would like it to be printed on the certificate).

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Signature of the invigilator

Signature of the candidate

AMITY INSTITUTE FOR COMPETITIVE EXAMINATIONS

DELHI CENTRES: • E-25, Defence Colony, New Delhi - 110024. Ph.: 011-24336143/44, 24331000-02.
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Each question has four alternatives marked (A), (B), (C) and (D), but only one of these alternatives is the correct answer.

1. When light enters into an optically rarer medium (from optically denser medium), then its (tick-mark the *wrong* statement)

(A) frequency remains same (B) energy increases

(C) wavelength increases (D) speed increases

2. The term variation means the difference in characteristics of organisms belonging to the same species in a natural population. The number of successful variations are maximized by

(A) reproduction by multiple fission

(B) vegetative propagation, especially grafting

(C) by the process of sexual reproduction

(D) environmental factors like habitat and ecological niches

3. Match the chemical compounds given in column I with their respective uses given in column II and tick-mark(√) the correct matching.

	Column I		*Column II*
(a)	$CaOCl_2$	(i)	as antacid; reduces acidity in stomach and provides relief
(b)	$NaHCO_3$	(ii)	used for supporting fractured bones in right position
(c)	$Na_2CO_3 . 10\ H_2$	(iii)	bleaching cotton and lenin in textile industry
(d)	$CaSO_4 . \frac{1}{2}\ H_2O$	(iv)	used in soap, paper and glass industries

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

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

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

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

4. Which one of the following statements is *not* correct ?

(A) Zinc oxide shows the properties of basic oxide as well as acidic oxide

(B) Hydrogen gas is evolved when a metal reacts with HNO_3

(C) Mercury is a metal and bromine is a non-metal, but both are liquids at room temperature

(D) Potassium produces fire on the surface of water

5. Tick-mark(√) the *incorrect* statement from the following.

(A) In plants, phloem transports product of photosynthesis from the leaves, where these are synthesised, to the other parts of the plant

(B) Transpiration in plants helps in temperature regulation

(C) CO_2 has more solubility than O_2 in water and hence in blood. This large amount of CO_2 in the blood is removed from it in the lungs

(D) The breakdown of pyruvate to produce carbon dioxide, water and energy (in the absence of oxygen) takes place in mitochondria

6. A part of the periodic table is shown below :

Group Number

Period Number	13	14	15	16	17	18
2	–	–	*B*	–	–	–
3	*A*	*C*	–	–	–	–
4	–	–	–	*D*	–	*E*
5	–	–	–	–	–	–

On the basis of the above information, tick-mark(√) the *wrong* statement from the following.

(A) *A* has 13 protons and 13 neutrons in its nucleus

(B) *B* is an important nutrient element and is a constituent of proteins and amino-acids

(C) *C* is a metalloid. It forms covalent bond with the atoms of its element or other elements.

(D) *E* is a non-reactive inert element

Rough Work

7. Oxygen and nitrogen dioxide gases are emitted when solid lead nitrate is heated in a test tube. If the amount of lead nitrate is sufficient to produce 0.16 g of oxygen, then the amount of nitrogen dioxide produced would be

(A) 0.23 g (B) 0.46 g

(C) 0.92 g (D) 1.84 g

8. Compare the statements given in column II with the values given in column I and tick-mark(√) the correct matching.

	Column I	*Column II*
(a)	50 cm	(i) If an object is moved by 50 cm away from a plane mirror, the distance moved by its image from the object
(b)	40 cm	(ii) Position of image of a small object placed at 50 cm from a convex lens of focal length 25 cm
(c)	25 cm	(iii) Focal length of lens of power 2.5 D
(d)	100 cm	(iv) Focal length of a concave mirror of radius of curvature 40 cm
(e)	20 cm	(v) Nearest point of a normal eye

(A) (a) - ii, (b) - i, (c) - v, (d) - iii, (e) - iii

(B) (a) - i, (b) - iii, (c) - v, (d) - ii, (e) - iv

(C) (a) - ii, (b) - iii, (c) - v, (d) - i, (e) - iv

(D) (a) - ii, (b) - iii, (c) - i, (d) - v, (e) - iv

9. Tick-mark(√) the *incorrect* statement from the following.

(A) Precision of voluntary actions like maintaining posture and balance of the body, riding a bicycle, walking in a straight line, etc. are possible due to mid-brain

(B) Separate areas specialized for hearing, smell and sight are located in fore-brain

(C) Brain is not involved in the reflex actions

(D) Beating of heart, breathing and digestion of food are involuntary actions

10. Some organic compounds can have many structural isomers. The possible number of structural isomers in case of organic compound C_5H_{12} is

(A) 5 (B) 4

(C) 3 (D) 2

11. Plant hormones are chemicals that regulate plant growth i.e., shaping of plant, affecting seed growth, time of flowering, leaf formation, stem growth, fruit development and ripening, plant longevity and even plant death. Match the functions of plant hormones given in column I with corresponding hormones given in column II and tick-mark(√) the correct matching.

	Column I	*Column II*
(a)	Range of chemicals which help seed germination and also enzyme production that mobilizes food production which new cells need for growth	(i) cytokinins
(b)	Groups of chemicals that influence cell division and shoot formation	(ii) abscisic acid
(c)	Chemical compounds that positively influence cell enlargement, bud formation and root initiation	(iii) gibberellins
(d)	It acts as inhibitory chemical compound that affects leaf and bud growth	(iv) auxins

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

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

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

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

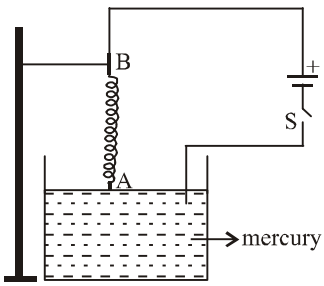
12. A spring is held between two conducting rods *A* and *B*. Rod *A* just touches the surface of mercury and end *B* is clamped to stand, as shown. When switch *S* is closed, then

(A) Position of *A* will not change and will continue to be just touching the surface of mercury

(B) *A* will move up and no current will flow in the circuit

(C) *A* will further immerse into the mercury

(D) *A* will start oscillating up and down



13. Cyclohexane has

(A) 24 covalent bonds (B) 18 covalent bonds

(C) 12 covalent bonds (D) 6 covalent bonds

14. Match the statements of column I and column II and tick-mark(√) the correct matching.

Column I	*Column II*
(a) Secretion of amylase helps breakdown of starch to give sugar	(i) liver
(b) The release of hydrochloric acid, protein-digesting enzyme pepsin and mucus by the gastric glands	(ii) small intestine
(c) Site of complete digestion of carbohydrates, proteins and fats	(iii) stomach
(d) Secretion of bile juice which makes the food alkaline for further digestion of fats	(iv) salivary glands

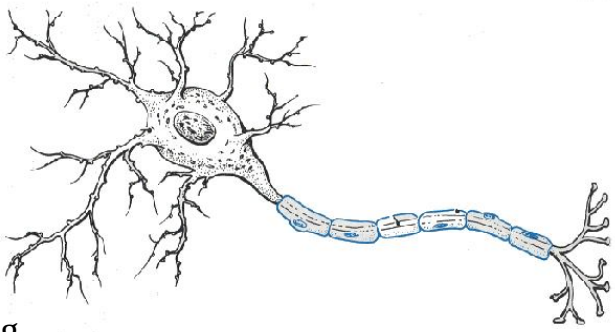
(A) (a) - iii, (b) - iv, (c) - ii, (d) - i

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

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

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

15. Neurons are the responsive cells in the nervous system that process and transmit information by electrical and chemical signals. These are core components of the brain, the vertebrate spinal cord, the invertebrate ventral nerve cord, and the peripheral nerves. The part of the neuron where information is acquired is



(A) axon

(B) cell body

(C) dendrite

(D) terminal button or nerve ending

16. Life on earth depends on

(A) Nitrogen-based molecules (B) Hydrogen-based molecules

(C) Carbon-based molecules (D) Oxygen-based molecules

17. Match the statements of column I and column II and tick-mark(√) the correct matching.

Column I		*Column II*	
(a)	Amalgamation	(i)	providing a protective or decorative coat to a metal
(b)	Alloying	(ii)	mixing with or applying a layer of mercury
(c)	Anodising	(iii)	providing a protective layer of zinc on steel or iron to avoid rusting
(d)	Galvanising	(iv)	homogeneous mixing of metals with metals or non-metals for better use

(A) (a) - iii, (b) - iv, (c) - i, (d) - iii

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

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

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

Rough Work

18. Barium chloride + aluminium sulphate $\rightarrow$

Barium sulphate + aluminium chloride

In the above balanced equation, the minimum numbers of chlorine and oxygen atoms involved are, respectively,

(A) 6 and 12 (B) 6 and 8

(C) 4 and 12 (D) 4 and 8

19. Carbon in all allotropic forms and most of carbon compounds burn in oxygen to produce heat and light. For burning completely 46 gram of ethanol, what minimum number of moles of oxygen is needed ?

(A) 6 moles (B) 4 moles

(C) 3 moles (D) 2 moles

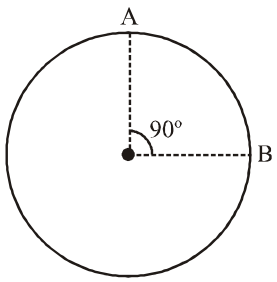
20. A wire of resistance of 16 Ω is bent in the form of a circle as shown. The resistance between points A and B of this circular wire would be

(A) 6 Ω

(B) 4 Ω

(C) 3 Ω

(D) 2 Ω



21. 12 identical cells are connected in series and are kept in a closed box. Some of the cells are wrongly connected. This battery is connected in series with an ammeter and 2 cells identical with others. Current is 4A when the cells and battery aid each other; and 2A when the cells and battery oppose each other. The number of cells connected wrongly in the battery should be

(A) 4 (B) 3

(C) 2 (D) 1

22. Tick-mark(√) the *incorrect* statement from the following.

(A) Light enters the eye through a thin membrane called the cornea

(B) When a person enters a dim-lit room (from bright light outside), the iris expands the pupil to allow more light to enter the eye, enabling it to see things around

(C) Iris regulates and controls the amount of light entering the eye

(D) The retina is a delicate membrane having enormous number of light-sensitive cells

23. Growth hormone is one of the hormones secreted by one of the many glands in our body. This hormone regulates the growth and development of the body. Its deficiency in childhood leads to dwarfism. The growth hormones are secreted from

(A) adrenal gland (B) parathyroid gland

(C) pineal gland (D) pituitary gland

24. Match the lenses and mirrors given in column I with their respective uses given in column II and tick-mark(√) the correct matching.

Column I	*Column II*
(a) Concave lens	(i) Microscope/Telescope
(b) Convex mirror	(ii) Kaleidoscope
(c) Convex lens	(iii) For seeing face during shaving
(d) Concave mirror	(iv) For correcting myopia
(e) Plane mirror	(v) Used for seeing rear view by a driver in a car/bus

(A) (a) - iv, (b) - v, (c) - i, (d) - ii, (e) - iii

(B) (a) - iv, (b) - v, (c) - i, (d) - iii, (e) - ii

(C) (a) - iv, (b) - iii, (c) - i, (d) - v, (e) - ii

(D) (a) - iv, (b) - v, (c) - ii, (d) - i, (e) - iii

25. Which one of the following is *not* the effect of oxidation in the atmosphere ?

(A) Blue crystals of copper sulphate lose their blue colour after some time, on exposure

(B) Fat/oil-containing food materials become rancid (bad in smell and taste), when left for a long time

(C) Sodium is preserved by immersing it in kerosene oil

(D) Corrosion of bodies made of iron

26. Which one of the following statements is *not* correct ?

(A) Variation is not very useful for the survival of species over time

(B) Plants raised by vegetative propagation can bear flowers and fruits earlier than those produced from seeds

(C) No bio-chemical reaction is absolutely reliable

(D) New generation created from a single individual is known as asexual reproduction

27. Ovary, style and stigma located in the flower of a plant are associated with

(A) stamens (B) carpels

(C) sepals (D) petals

28. Which one of the following is correctly matched ?

	Defects of eye	*Position of image formed*	*Nature of correcting lens*	*Focal length of correcting lens*
(A)	Hypermetropia	in front of retina	concave lens	negative
(B)	Hypermetropia	beyond retina	convex lens	positive
(C)	Myopia	in front of retina	convex lens	positive
(D)	Myopia	beyond retina	concave lens	negative

29. Refractive index of glass is 1.5. The time taken by light to pass through a window pane of glass of thickness 2 mm is nearly equal to

(A) 10^{-9} s (B) 10^{-10} s

(C) 10^{-11} s (D) 10^{-12} s

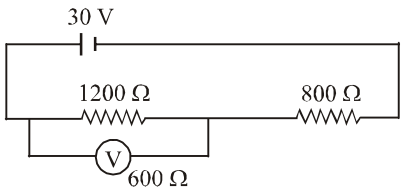
30. A voltmeter of resistance 600 Ω is connected in a circuit as shown in the figure. What will be the reading of the voltmeter ?

(A) 10 V

(B) 15 V

(C) 18V

(D) 20 V



31. Aluminium oxide shows its basic nature when it reacts with hydrochloric acid. In balanced chemical reaction

$$a\ Al_2O_3 + b\ HCl \rightarrow c\ AlCl_3 + d\ H_2O\ ,$$

the values of *b* and *c* are, respectively,

(A) 8 and 4 (B) 6 and 4

(C) 3 and 2 (D) 6 and 2

32. A thin object of height 1.0 cm is placed at the focus of a convex mirror. Which one of the following statements is correct ?

(A) An inverted image of size 0.5 cm is formed at f/2 from the mirror

(B) An inverted image of very large size is formed at infinity from the mirror

(C) An erect image of size 0.5 cm is formed at f/2 from the mirror

(D) An erect image of very large size is formed at infinity from the mirror

33. The process of acquiring oxygen from outside the body and to use it in the process of break-down of food sources for cellular needs is known as

(A) digestion (B) photosynthesis

(C) nutritional process (D) respiration

34. Which one of the following phenomenon does not involve scattering of light ?

(A) Appearance of blue colour of the sky during day time

(B) Reddish appearance of the sun at sunrise or sunset

(C) Twinkling of the star

(D) Tyndall effect

35. Tick-mark(√) the *incorrect* statement from the following.

(A) If the substance to be burnt is not gaseous, flame will not be produced, howsoever the amount of the substance is

(B) Substitution reaction can take place in ethyne but not in ethene

(C) The ionic-end of soap molecule (micelle) dissolves in water while the carbon chain dissolves in oil

(D) The large number of compounds of carbon is due to its two characteristic features of tetravalency and catenation

36. Match the statements of column I with those in column II and tick-mark(√) the correct matching.

	Column I		*Column II*
(a)	Left atrium	(i)	Deoxygenated blood from the body enters this chamber of the heart
(b)	Right atrium	(ii)	Blood is transferred from this chamber of the heart to the lungs for oxygenation
(c)	Left ventricle	(iii)	Oxygen-rich blood from the lungs enters this chamber of the heart
(d)	Right ventricle	(iv)	Oxygen-rich blood is pumped to all the parts of the body from this chamber of the heart

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

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

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

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

37. Tick-mark(√) the *incorrect* statement from the following.

(A) Herbivores have longer small intestine than carnivores

(B) The release of energy in the anaerobic process is greater than in the aerobic process

(C) Internal energy reserve in animals is stored in the form of glycogen

(D) Autotrophs use simple food material in the form of carbon dioxide and water

38. Which one of the following group of metals has proper increasing order of reactivity ?

(A) Calcium > Zinc > Lead > Aluminium

(B) Calcium > Aluminium > Lead > Zinc

(C) Calcium > Zinc > Aluminium > Lead

(D) Calcium > Aluminium > Zinc > Lead

39. Which one of the following is not an ionic compound ?

(A) MgO (magnesium oxide) (B) CO (carbon monoxide)

(C) $MgCl_2$ (magnesium chloride) (D) CaO (calcium oxide)

40. An aluminium ring hangs vertically from a thread with its axis pointing east-west. A coil is fixed near to the ring and coaxial with it.

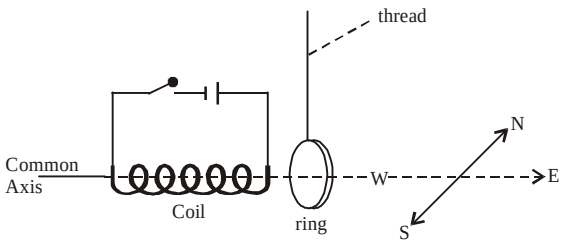
What is the initial motion of the aluminium ring when the current in the coil is switched on ?

(A) Moves towards S

(B) Remains at rest

(C) Moves towards E

(D) Moves towards W



ANSWERS CLASS X (SCIENCE)

1	B	2	C	3	B	4	B	5	D
6	A	7	C	8	C	9	A	10	C
11	B	12	D	13	B	14	D	15	C
16	C	17	B	18	A	19	C	20	C
21	B	22	C	23	D	24	B	25	A
26	A	27	B	28	B	29	C	30	A
31	D	32	C	33	D	34	C	35	B
36	C	37	B	38	D	39	B	40	C