

State Talent Search Examination, 2012

Time : 2 Hours

Max. Marks : 150

Instructions to candidates :

1. Answer are to be marked on the separate Answer Sheet which will be collected after the time is over.
2. Please write your Roll No. very clearly (only one digit in one block) as given on your Admission Card. Please see that no block is left unfilled and even zeros appearing in the Roll No., if any, are correctly transferred to the appropriate blocks on the booklet and on the Answer Sheet.

Example :

R	J	0	1	1	8	2
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For all subsequent purposes, your Roll No. shall remain the same as given on the Admission Card.

3. This test is in SIX parts. Each part consists of 25 questions. In all, 150 questions are to be attempted. Each question carries **one** mark.
4. Since all the questions are compulsory, do not try to read through the whole question paper before beginning to answer it.
5. Begin with the first question and keep on attempting one question after another till you finish.
6. If you do not know the answer to any question, do not spend much time on it and pass on to the next one. If time permits, you can come back to the questions which you have left in the first instance and try them again.
7. Space has been provided for rough work at the bottom of each page.
8. Answer to each question is to be indicated by blackening, with H.B. pencil, the bubble (circle) of the correct alternative in the separately given Answer Sheet from amongst the ones given for the corresponding question in the test booklet. Please also read the instructions carefully, given on the back side of the Answer Sheet.

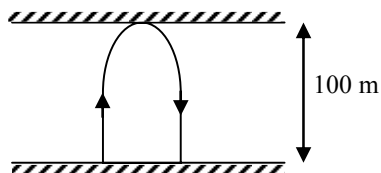
PHYSICS

(Question Nos. 1 to 25)

1. A man swims in a 100 metre long swimming pool. He covers 200 metre in one minute by swimming from one end to the other and return along the same straight path. His average velocity will be
 (1) $200 \text{ m}^1\text{s}^{-1}$ (2) $10 \text{ m}^1 \text{ s}^{-1}$ (3) $3 \text{ m}^1 \text{ s}^{-1}$ (4) $0 \text{ m}^1 \text{ s}^{-1}$

Ans. [4]

Sol.



$$V_{Av} = \frac{\text{displacement}}{\text{time}} = \frac{0}{1} = 0$$

2. A boy of 60 kg mass raises 40 kg mass up to a height 10 metre in 50 second. Then related value of power will be ($g = 9.8 \text{ m}^1\text{s}^{-2}$)

- (1) 196 watt (2) 96 watt (3) 19.6 watt (4) 9.6 watt

Ans. [1]

Sol. $P = \frac{E}{t} = \frac{mgh}{t} = \frac{100 \times 9.8 \times 10}{50} = 196 \text{ W}$

3. For maximum work the angle between force and displacement will be -

- (1) 270° (2) 180° (3) 90° (4) 0°

Ans. [4]

Sol. $W = F \times d \times \cos \theta$

for W_{\max} , $\theta = 0^\circ$

4. A block of wood is kept on a table top. The mass of wooden block is 5 kg and its dimensions are $40 \text{ cm} \times 20 \text{ cm} \times 10 \text{ cm}$. If the dimensions of the surface of block touching the table top are $20 \text{ cm} \times 10 \text{ cm}$, the pressure applied by the block on the table top will be (Given : $g = 9.8 \text{ ms}^{-2}$)-

- (1) 6125 Nm^{-2} (2) 2450 Nm^{-2} (3) 61.25 Nm^{-2} (4) 24.50 Nm^{-2}

Ans. [2]

Sol. $P = \frac{F}{A} = \frac{5 \times 9.8}{20 \times 10 \times 10^{-4}} = 2450 \text{ Nm}^{-2}$

5. A ball thrown up vertically returns to the thrower after 6 seconds. The velocity with which it was thrown vertically up will be ($g = 9.8 \text{ m}^1\text{s}^{-2}$) -

- (1) $2.94 \text{ m}^1\text{s}^{-1}$ (2) $5.88 \text{ m}^1\text{s}^{-1}$ (3) $29.4 \text{ m}^1\text{s}^{-1}$ (4) $58.8 \text{ m}^1\text{s}^{-1}$

Ans. [3]

Sol. $V = u + at$

$\Rightarrow 0 = u - 9.8 \times 3$

$\Rightarrow u = 29.4 \text{ m/s}$

6. Work done in increasing the velocity of a car of mass 1000 kg from 36 km/hour to 72 km/hour will be -

- (1) $1.5 \times 10^3 \text{ joule}$ (2) $1.5 \times 10^5 \text{ joule}$ (3) $1.5 \times 10^6 \text{ joule}$ (4) $1.5 \times 10^7 \text{ joule}$

Ans. [2]

Sol. $w = \Delta \frac{1}{2} mv^2$

$$= \frac{1}{2} \times 1000 \left[\left(72 \times \frac{5}{18} \right)^2 - \left(36 \times \frac{5}{18} \right)^2 \right]$$

$$= \frac{1}{2} \times 1000 [20^2 - 10^2] = 1.5 \times 10^5 \text{ J}$$

7. Acceleration due to gravity at the height of $2R$ from the earth surface will be (R = radius of earth and g = acceleration due to gravity at earth surface) -

- (1) g (2) $\frac{g}{4}$ (3) $\frac{g}{8}$ (4) $\frac{g}{9}$

Ans. [4]

Sol. $g = \frac{GM}{(R+h)^2} = \frac{GM}{9R^2} = \frac{g}{9}$

8. An engine of mass 8000 kg pulls a wagon of mass 2000 kg along a horizontal track. If the engine applies a force of 40000 newton and the track offers a friction force of 10000 newton, acceleration of the train will be-

- (1) $0 \text{ m}^1 \text{ s}^{-2}$ (2) $3 \text{ m}^1 \text{ s}^{-2}$ (3) $4 \text{ m}^1 \text{ s}^{-2}$ (4) $5 \text{ m}^1 \text{ s}^{-2}$

Ans. [2]

Sol. Net force = 40,000 – 10,000 = 30,000

$$30,000 = 10,000 \times a$$

$$a = 3 \text{ m/s}^2$$

9. SI unit of universal gravitational constant is -

- (1) $\text{Nm}^2 \text{ kg}^{-2}$ (2) $\text{Nm}^{-2} \text{ kg}^{-2}$ (3) $\text{Nm}^{-2} \text{ kg}^2$ (4) $\text{Nm}^2 \text{ kg}^2$

Ans. [1]

Sol. $F = \frac{GM^2}{R^2} \Rightarrow G = \frac{\text{Nm}^2}{\text{kg}^2}$

10. Weight of a block in air is 49 N. When it is suspended in water, the mass of block will be ($g = 9.8 \text{ m}^1 \text{ s}^{-2}$)-

- (1) 49 kg (2) 55 kg (3) 5 kg (4) 0 kg

Ans. [3]

Sol. $M = \frac{49}{9.8} = 5 \text{ kg}$

11. In which of the following medium the speed of sound is maximum ?

- (1) Glass (2) Water (3) Air (4) Iron

Ans. [4]

Sol. Solid

12. To hear a distinct echo the minimum time interval between the original sound and reflected sound must be -

- (1) 0.1 s (2) 0.2 s (3) 1.0 s (4) 2.0 s

Ans. [1]

Sol. $\frac{1}{10} \text{ sec} = 0.1 \text{ sec}$

13. A sound wave travels at a speed of 340 ms^{-1} . If its wavelength is 3.4 cm, what is the frequency of the wave ?
Will it be audible by human ears ?

- (1) 10,000 Hz non-audible (2) 10,000 Hz audible
(3) 100 Hz non-audible (4) 100 Hz audible

Ans. [2]

Sol. $V = n\lambda$

$$340 = n \times \frac{3.4}{100} \Rightarrow 10,000 \text{ Hz audible}$$

14. The phenomenon of scattering of light by the colloidal particles is known as

- (1) photoelectric effect (2) Doppler effect
(3) heating effect of light (4) Tyndall effect

Ans. [4]

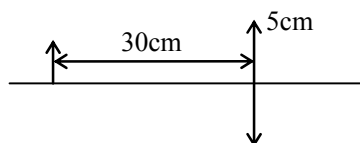
Sol. Tyndall effect

15. A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 5 cm. The distance of the object from the lens is 30 cm. The nature and size of the image will be -

- (1) real, 1 cm (2) virtual, 1 cm (3) real, -1 cm (4) virtual, -1 cm

Ans. [3]

Sol.



$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$\frac{1}{5} = \frac{1}{v} + \frac{1}{30}$$

$$\frac{6-1}{30} = \frac{5}{30}$$

$$v = 6 \text{ cm}$$

$$\text{Real } M = \frac{I}{O} = \frac{v}{u}$$

$$\frac{I}{5} = \frac{6}{-30} \Rightarrow I = -1$$

16. Refractive indices of glass, water and kerosene are μ_g , μ_w and μ_k respectively. Correct relation between them is -

- (1) $\mu_g < \mu_w < \mu_k$ (2) $\mu_w < \mu_k < \mu_g$ (3) $\mu_k < \mu_w < \mu_g$ (4) $\mu_g < \mu_k < \mu_w$

Ans. [2]

Sol. $\mu_g = 1.5$; $\mu_w = 1.33$; $\mu_k = 1.44$

17. The speed of light in vacuum is $3 \times 10^8 \text{ ms}^{-1}$. The refractive index of diamond is 2.40. The speed of light in diamond will be -

- (1) $3 \times 10^8 \text{ ms}^{-1}$ (2) $0.8 \times 10^8 \text{ ms}^{-1}$ (3) $1.25 \times 10^8 \text{ ms}^{-1}$ (4) $7.2 \times 10^8 \text{ ms}^{-1}$

Ans. [3]

Sol.
$$v = \frac{c}{\mu} = \frac{3 \times 10^8}{2.4} = 1.25 \times 10^8 \text{ ms}^{-1}$$

18. 1 kWh is equivalent to -

- (1) $3.6 \times 10^6 \text{ erg}$ (2) $3.6 \times 10^5 \text{ joule}$ (3) $3.6 \times 10^5 \text{ erg}$ (4) $3.6 \times 10^6 \text{ joule}$

Ans. [4]

Sol. $1 \text{ kWh} = 1 \times 1000 \times 3600 = 36 \times 10^5 = 3.6 \times 10^6 \text{ joule}$

19. An electric refrigerator rated 400 W operates 10 hour/day. The cost of the energy to operate it for the month of June at Rs. 5.0 per kWh will be -

- (1) Rs. 20 (2) Rs. 300 (3) Rs. 360 (4) Rs. 600

Ans. [4]

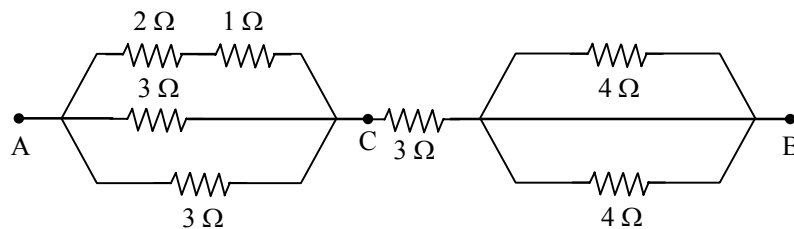
Sol. $E = P \times T$

$$= \frac{400}{1000} \times 10 \times 30$$

$$\text{cost} = \frac{400}{1000} \times 10 \times 30 \times 5$$

$$= 120 \times 5 = \text{Rs. } 600$$

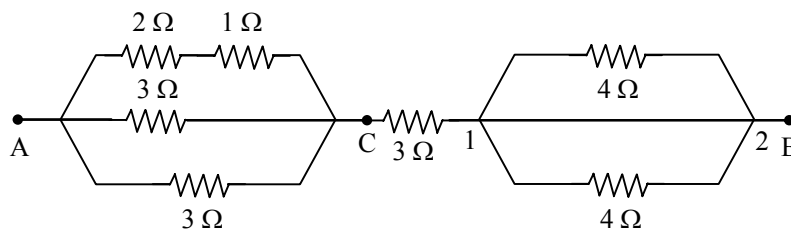
20. Equivalent resistance between points A and B of the following combination of resistances will be -



- (1) 6Ω (2) 12Ω (3) 14Ω (4) 20Ω

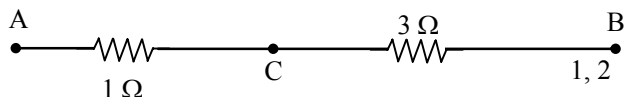
Ans. [4 Ω]

Sol.



$$R_{eq} = 3 \parallel 3 \parallel 3$$

$$R_{eq} = 1 + 3 = 4 \Omega$$



If 1 and 2 are short then $R_{eq} = 4$

So 4Ω should be the correct answer, that is not in option.

21. The resistance of a copper wire is R . It is stretched to its double length. Its new resistance will be -
 (1) R (2) $2R$ (3) $3R$ (4) $4R$

Ans. [4]

Sol. $R' = n^2 R \Rightarrow R' = 4R$

22. The magnetic field at a point situated inside the current carrying solenoid is
 (1) uniform (2) zero
 (3) inversely proportional to distance (4) directly proportional to distance

Ans. [1]

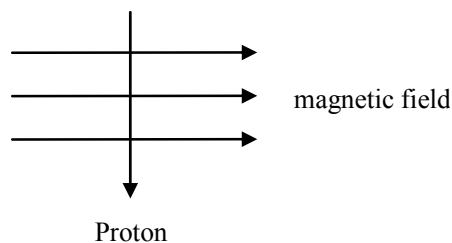
Sol.



Inside the solenoid magnetic field is uniform

$$B = \mu_0 ni$$

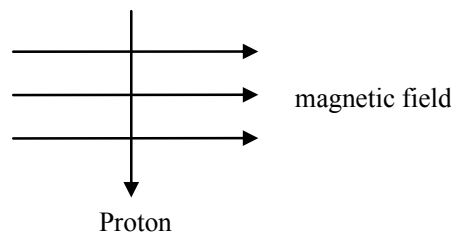
23. A proton enters in magnetic field at right angles to it, as shown in figure. The direction of force acting on proton will be



- (1) to the right
 (2) to the left
 (3) perpendicular and outwards to the plane of paper
 (4) perpendicular and inwards to the plane of paper

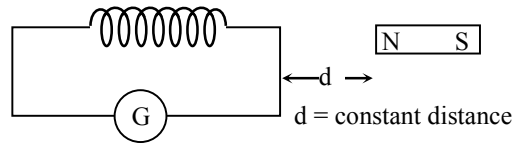
Ans. [3]

Sol.



Magnetic field by using Fleming right hand rule direction of F is \perp or outward.

24. The direction of deflection in galvanometer in the given figure will be



- (1) to the left
 (2) to the right
 (3) changeable with time
 (4) no deflection

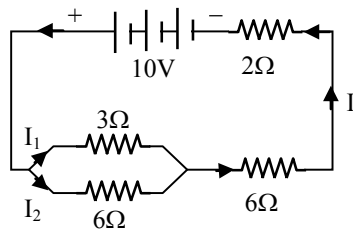
Ans. [4]

Sol. Magnet is not moving

So there is no change in magnetic field

So no induced current.

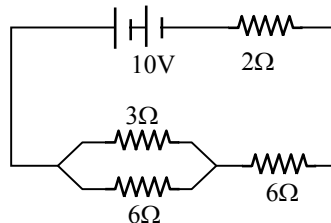
25. Current (I) and equivalent resistance of circuit in the following circuit will be



- (1) 1 A, 10 Ω (2) 10 A, 1 Ω (3) $\frac{10}{17}$ A, 17 Ω (4) 17 A, $\frac{10}{17}$ Ω

Ans. [1]

Sol.



$$R_{eq} = (3 \parallel 6) + 6 + 2 = 2 + 6 + 2 = 10 \Omega$$

$$I = \frac{V}{R_{eq}} = \frac{10}{10} = 1 \text{ A}$$



CHEMISTRY

(Question Nos. 1 to 25)

1. The number of moles of 11 gm of carbon dioxide gas at NTP is -
(1) 1.00 (2) 0.75 (3) 0.50 (4) 0.25
- Ans.** [4]
- Sol.** $n_{\text{CO}_2} = \frac{11}{44} = 0.25$
2. The cation (M^{2+}) has 12 protons, 12 neutrons and 10 electrons. Then atomic number and atomic mass of its atom are -
(1) 12, 12 (2) 12, 24 (3) 10, 24 (4) 12, 10
- Ans.** [2]
- Sol.** Atomic number (z) = no. of protons = 12
Atomic mass = no. of proton + no. of neutrons
= 12 + 12 = 24
3. The solution having pH = 10 is -
(1) Acidic (2) Alkaline (3) Amphoteric (4) Neutral
- Ans.** [2]
- Sol.** If $\text{pH} > 7$
then solution is alkaline (basic)
4. A particular coloured light is observed by passing electricity in Neon bulb. The state of matter responsible for this effect is -
(1) Solid (2) Liquid (3) Plasma (4) Gas
- Ans.** [4]
- Sol.** Gas
5. Metal (A) and mercury are brought together to form a substance (B), which is homogeneous. Substance (B) is -
(1) Element (2) Compound (3) Alloy (4) Amalgam
- Ans.** [4]
6. Wolfram is the name of -
(1) Silver (2) Tungsten (3) Lead (4) Gold
- Ans.** [2]
7. The molecular formula of metal (M) is $M_3(\text{PO}_4)_2$. Then the molecular formula of its nitrate is -
(1) $M(\text{NO}_3)_3$ (2) $M(\text{NO}_3)_2$ (3) $M_3(\text{NO}_3)$ (4) $M_2(\text{NO}_3)$
- Ans.** [2]
- Sol.** $M^{+2} \text{NO}_3^{-1} \Rightarrow M(\text{NO}_3)_2$



8. The percentage of metal in CaCO_3 is -
(1) 100 (2) 48 (3) 40 (4) 12
Ans. [3]
Sol. Molecular wt. of $\text{CaCO}_3 = 40 + 12 + 48 = 100$
 $\% \text{ of metal} = \frac{40}{100} \times 100 = 40\%$
9. The type of reaction $\text{CuSO}_4 + \text{Zn} \rightarrow \text{ZnSO}_4 + \text{Cu}$ is -
(1) Synthesis (2) Substitution
(3) Double decomposition (4) Thermal decomposition
Ans. [2]
Sol. $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$
It is a substitution reaction.
10. Criteria of purity of liquid substance is -
(1) Melting point (2) Boiling point (3) Viscosity (4) Solubility
Ans. [2]
11. Sky looks blue due to -
(1) Dispersion effect (2) Reflection effect (3) Scattering effect (4) Transmission effect
Ans. [3]
Sol. Sky looks blue due to scattering effect.
12. The formula of Marsh gas is -
(1) CO_2 (2) O_2 (3) CH_4 (4) N_2
Ans. [3]
13. The role of oxidizing agent in a reaction is -
(1) Gaining of electron (2) Gaining of proton
(3) Deelectronation (4) Deprotonation
Ans. [1]
Sol. Oxidizing agent is electron acceptor.
14. Ammoniacal silver nitrate is -
(1) Bayer's reagent (2) Tollen's reagent (3) Fehling solution (4) Schiff's reagent
Ans. [2]
15. Which one of the following is the general formula of acetylene ?
(1) $\text{C}_n\text{H}_{2n-2}$ (2) C_nH_{2n} (3) $\text{C}_n\text{H}_{2n+1}$ (4) $\text{C}_n\text{H}_{2n+2}$
Ans. [1]
Sol. General formula of alkyne is $\text{C}_n\text{H}_{2n-2}$
16. Which one of the following substances is sublimate ?
(1) NaCl (2) KNO_3 (3) NH_4Cl (4) CaCO_3
Ans. [3]



17. The functional group present in ethanal is -
(1) –OH (2) –CHO (3) –COOH (4) > C=O
Ans. [2]
Sol. al is suffix of aldehyde group (–CHO)
18. The mixture of Petrol, Alcohol and Benzene is -
(1) Power alcohol (2) Methylated alcohol (3) Natalite (4) Bakelite
Ans. [1]
19. Milk is an example of -
(1) Sol (2) Gel (3) Micelle (4) Emulsion
Ans. [4]
20. The components of stainless steel are -
(1) Fe, Cr, Ni (2) Fe, Mn, Co (3) Fe, Co, Ni (4) Fe, Cr, Mn
Ans. [1]
Sol. Fe + Cr + Ni
21. Gamma rays are -
(1) Electrons of high energy (2) Positrons of high energy
(3) Electromagnetic waves of high energy (4) Electrons of lower energy
Ans. [3]
22. Thermodynamically the most stable form of carbon is -
(1) Graphite (2) Diamond (3) Peat (4) Coal
Ans. [1]
23. The numbers of periods and groups present in I.U.P.A.C. periodic table are -
(1) 6, 8 (2) 6, 9 (3) 7, 18 (4) 7, 8
Ans. [3]
24. Which metal does exist in liquid state at room temperature ?
(1) Fe (2) Na (3) Mg (4) Hg
Ans. [4]
25. The number of p-electrons present in element [${}_{16}\text{X}^{32}$] is -
(1) 4 (2) 6 (3) 8 (4) 10
Ans. [4]
Sol. Atomic number (16)
Electronic configuration = $1s^2 2s^2 2p^6 3s^2 3p^4$
No. of p-electrons = 6 + 4 = 10

BIOLOGY

(Q.No. 1 to 25)

1. Vitaminized oil is obtained from -

- (1) hen (2) honeybee (3) fish (4) cow

Ans. [3]

Sol.

2. The examples of intercropping are -

- (1) Cotton, Mung (2) Soyabean, Maize (3) Wheat, Gram (4) Wheat, Mustard

Ans. [2]

Sol.

3. Which of the following is responsible for abortion ?

- (1) Excess of progesterone (2) Deficiency of progesterone
(3) Excess of thyroxine (4) Deficiency of thyroxine

Ans. [2]

Sol. Progesterone is responsible for maintaining pregnancy.

4. The most popular variety of hen for production of eggs in dry areas is -

- (1) Cornish (2) White Leghorn
(3) Langshan (4) Rhode Island Red

Ans. [2]

Sol. White leghorn

5. Which animal is cultured for obtaining natural pearls ?

- (1) Prawn (2) Sea fly
(3) Oyster (4) Sepia

Ans. [3]

Sol. Oyster

6. The smallest organelle in a cell is -

- (1) Lysosome (2) Ribosome
(3) Peroxysome (4) Sphaerosome

Ans. [2]

Sol. Ribosome



7. Urea synthesis cycle is known as -

- (1) Ornithine cycle (2) Kreb's cycle
(3) Calvin cycle (4) Hatch-Slack cycle

Ans. [1]

Sol. Ornithine cycle takes place in liver in which ornithine produced as by product.

8. Human organ affected by endoparasitic fluke (Fasciola) is -

- (1) Liver (2) Stomach
(3) Intestine (4) Lungs

Ans. [1]

Sol. Liver

9. Which of the following is called 'Devil fish' ?

- (1) Cattle fish (2) Electric fish
(3) Octopus (4) Sea horse

Ans. [3]

Sol. Octopus

10. The pair of pyrimidine type nitrogen base is -

- (1) Adenine – Guanine (2) Guanine – Cytosine
(3) Thymine – Uracil (4) Uracil - Adenine

Ans. [2]

Sol. Guanine – Cytosine

11. Deposition on the dead cell wall of a plant bark is -

- (1) Pectin (2) Cutin
(3) Lignin (4) Suberin

Ans. [4]

Sol. Suberin

12. 'Tonoplast' separates -

- (1) Cytoplasm from cell wall (2) Cytoplasm from vacuolar sap
(3) Cytoplasm from Mitochondria (4) Cytoplasm from nucleoplasm

Ans. [2]

Sol. Tonoplast is a separating membrane and separates Cytoplasm from vacuolar sap

13. 'Horse tail' is the common name of -

- (1) *Cycas* (2) *Pinus*
(3) *Equisetum* (4) *Lycopodium*

Ans. [3]

Sol. *Equisetum*

14. The vitamin which induces production and maturation of Red Blood Corpuscles is -

- (1) Vitamin A (2) Vitamin K
(3) Vitamin B₁₂ (4) Vitamin D

Ans. [3]

Sol. Vitamin B₁₂ needed for building proteins in the body, red blood cells and normal function of nervous tissue

15. The example of fossil-fuel is -

- (1) Gobar gas (2) Petrol
(3) Hydrogen (4) Oxygen

Ans. [2]

Sol. Petrol

16. The substance digested in the caecum of herbivores is -

- (1) Fat (2) Protein
(3) Cellulose (4) Sucrose

Ans. [3]

Sol. Cellulose

17. Which of the following Mendel's laws states that "Gametes are not found in hybrid condition" ?

- (1) Dominance (2) Incomplete dominance
(3) Segregation (4) Independent assortment

Ans. [3]

Sol. Segregation

18. Chromosomes in 'Turner's syndrome' are -

- (1) 44 + XX (2) 44 + XY
(3) 44 + XO (4) 44 + XXY

Ans. [3]

Sol. Normal female have 2X chromosome but in turner syndrome one of those sex chromosomes is missing or has other abnormalities.

19. The protein, essential for blood clotting is -

- (1) Albumin (2) Globulin
(3) Haemoglobin (4) Fibrinogen

Ans. [4]

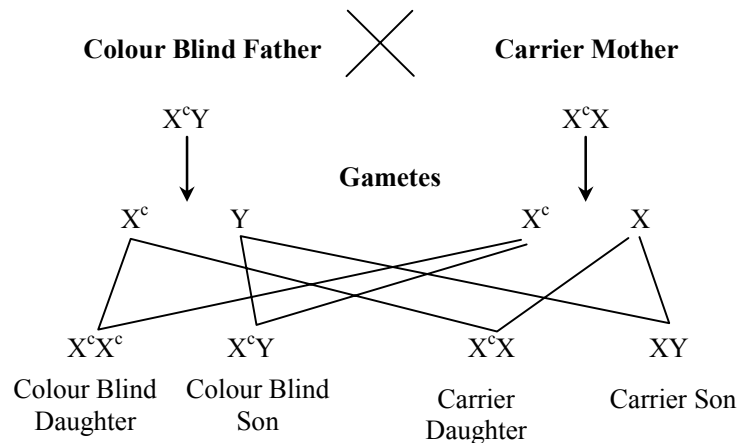
Sol. Fibrinogen is a non globular protein involved in the clotting of blood.

20. The true statement for colour-blind daughter is -

- (1) Father normal – Mother colour blind
(2) Father colour blind – Mother normal
(3) Father colour blind – Mother vector
(4) Father normal – Mother vector

Ans. [3]

Sol.



21. The correct sequence of hormone secretion in Menstrual cycle is -

- (1) F.S.H. Progesterone, Estrogen
(2) Estrogen, F.S.H., Progesterone
(3) Estrogen, Progesterone, F.S.H.
(4) F.S.H. Estrogen, Progesterone

Ans. [4]

Sol. F.S.H. Estrogen, Progesterone

22. Osculum and canal system are found in -

- (1) Sycon (2) Hydra
(3) Leech (4) Fish

Ans. [1]

Sol. Sycon



23. 'Genophore' is the name of -

- (1) Circular DNA (2) Bacterial DNA
(3) Double strand DNA (4) Double strand RNA

Ans. [2]

Sol. A Genophore is the DNA of a prokaryote.

24. The example of vegetative propagation by leaf are -

- (1) Potato, ginger (2) Doob grass, Bryophyllum
(3) Potato, Rose (4) Bryophyllum, Begonia

Ans. [4]

Sol. Bryophyllum, Begonia

25. If the cerebellum of man is removed, the affected function will be -

- (1) Body balance (2) Digestion
(3) Respiration (4) Memory and reasoning

Ans. [1]

Sol. The cerebellum is the area of the hind brain that control the motor movement coordination, balance, equilibrium and muscle tone.

MATHEMATICS

(Q.No. 1 to 25)

1. If $x + 2 = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ then the value of x is -

(1) $\sqrt{3}(\sqrt{3} - 2\sqrt{2})$

(2) $\sqrt{3}(\sqrt{3} + 2\sqrt{2})$

(3) $\sqrt{2}(\sqrt{3} - 2\sqrt{2})$

(4) $\sqrt{2}(\sqrt{3} + 2\sqrt{2})$

Ans. [2]

Sol. $x + 2 = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}} = \frac{(\sqrt{3} + \sqrt{2})^2}{3 - 2} = \frac{3 + 2 + 2\sqrt{6}}{1}$

$$x + 2 = 5 + 2\sqrt{6}$$

$$\therefore \boxed{x = 3 + 2\sqrt{6}}$$

$$= \sqrt{3}[\sqrt{3} + 2\sqrt{2}]$$

2. What is the square root of $(272^2 - 128^2)$?

(1) 144

(2) 200

(3) 240

(4) 260

Ans. [3]

Sol. $\sqrt{272^2 - 128^2}$

$$= \sqrt{(272 + 128)(272 - 128)}$$

$$= \sqrt{(400)(144)}$$

$$= 20 \times 12 = 240$$

3. If $x + 2$ divides $x^9 + x^8 + x^3 + x + 1$ then the remainder is -

(1) 260

(2) + 265

(3) - 260

(4) - 265

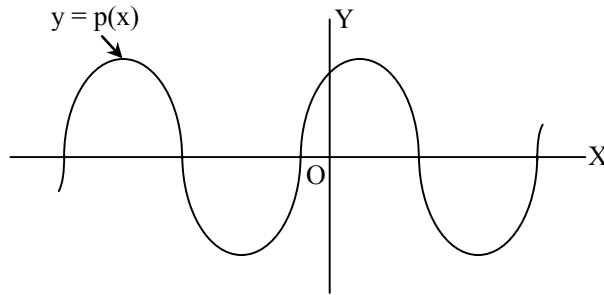
Ans. [4]

Sol. $p(x) = x^9 + x^8 + x^3 + x + 1$

$$p(-2) = (-2)^9 + (-2)^8 + (-2)^3 + (-2) + 1$$

$$= -512 + 256 - 8 - 2 + 1 = -265$$

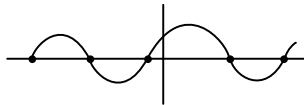
4. The graph of $y = p(x)$ is given below. The number of zeros of the polynomial $p(x)$ is -



- (1) 3 (2) 4 (3) 5 (4) 6

Ans. [3]

Sol.



5. If the sum of the squares of the roots of the quadratic equation $x^2 - 8x + k = 0$ is 40, then the value of k is -

- (1) 10 (2) 12 (3) 14 (4) 16

Ans. [2]

Sol. $x^2 - 8x + k = 0$

Let zeros (roots) are α & β

$$\therefore \alpha^2 + \beta^2 = 40$$

$$(\alpha + \beta)^2 - 2\alpha\beta = 40 \quad (\because \alpha + \beta = -b/a = -(-8/1) = 8)$$

$$(8)^2 - 2(k) = 40 \quad (\alpha\beta = c/a = k/1 = k)$$

$$2k = 64 - 40$$

$$k = \frac{24}{2} = 12$$

6. If the sum of n terms of an arithmetic series is $3n^2 - n$, then the 4th term will be -

- (1) 16 (2) 18 (3) 20 (4) 22

Ans. [3]

Sol. $S_n = 3n^2 - n$

$$\begin{aligned} \therefore a_4 &= S_4 - S_3 = [3(4)^2 - 4] - [3(3)^2 - 3] \\ &= (48 - 4) - (27 - 3) \\ &= 44 - 24 = 20 \end{aligned}$$



7. The difference between the 17th and 10th terms of an arithmetic series is 7. Then the common difference of the series will be -

- (1) 1 (2) 2 (3) 3 (4) 4

Ans. [1]

Sol. $a_{17} - a_{10} = 7$

$$(a + 16d) - (a + 9d) = 7$$

$$7d = 7 \Rightarrow d = 1$$

8. The value of $(1 + \cot \theta - \operatorname{cosec} \theta)(1 + \tan \theta + \sec \theta)$ is -

- (1) 1 (2) 2 (3) 0 (4) 4

Ans. [2]

Sol. $(1 + \cot \theta - \operatorname{cosec} \theta)(1 + \tan \theta + \sec \theta)$

$$= \left(1 + \frac{\cos \theta}{\sin \theta} - \frac{1}{\sin \theta}\right) \left(1 + \frac{\sin \theta}{\cos \theta} + \frac{1}{\cos \theta}\right)$$

$$= \left(\frac{\sin \theta + \cos \theta - 1}{\sin \theta}\right) \left(\frac{\cos \theta + \sin \theta + 1}{\cos \theta}\right)$$

$$= \frac{(\sin \theta + \cos \theta)^2 - 1}{\sin \theta \cos \theta} = \frac{1 + 2 \sin \theta \cos \theta - 1}{\sin \theta \cos \theta} = 2$$

9. The value of $\frac{\sin 18^\circ}{\cos 72^\circ}$ is -

- (1) 0 (2) -1 (3) 1 (4) 2

Ans. [3]

Sol. $\frac{\sin 18}{\cos 72}$

$$= \frac{\sin(90 - 72)}{\cos 72} \quad (\because 18 + 72 = 90) \ \& \ \sin(90 - \theta) = \cos \theta$$

$$= \frac{\cos 72}{\cos 72} = 1$$

10. $\frac{1 + \tan^2 A}{1 + \cot^2 A}$ is equal to -

- (1) $\sec^2 A$ (2) -1 (3) $\cot^2 A$ (4) $\tan^2 A$

Ans. [4]

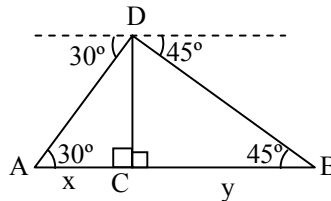
Sol. $\frac{1 + \tan^2 A}{1 + \cot^2 A} = \frac{\sec^2 A}{\operatorname{cosec}^2 A} = \frac{\sin^2 A}{\cos^2 A} = \tan^2 A$

11. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° respectively. If the bridge is at a height of 3 metres from the bank, the width of the river in metre is -

(1) $3(\sqrt{3}-1)$ (2) $\sqrt{2}(\sqrt{3}+1)$ (3) $\sqrt{3}(\sqrt{3}-2)$ (4) $3(\sqrt{3}+1)$

Ans. [4]

Sol.



In $\triangle ACD$:

$$\tan 30^\circ = \frac{3}{x}$$

$$x = 3\sqrt{3} \text{ m}$$

In $\triangle DCB$

$$\tan 45^\circ = \frac{3}{y}$$

$$y = 3 \text{ m}$$

$$\therefore AB = x + y = 3\sqrt{3} + 3 = 3(\sqrt{3} + 1)$$

12. The area of a triangle whose vertices are $(t, t-2)$, $(t+2, t+2)$ and $(t+3, t)$ is -

(1) 4 square units (2) 8 square units
(3) $4t$ square units (4) $8t$ square units

Ans. [1]

Sol. $(t, t-2)$, $(t+2, t+2)$, $(t+3, t)$

$$\Delta = \frac{1}{2} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$$

$$= \frac{1}{2} [t(t+2-t) + (t+2)(t-t+2) + (t+3)(t-2-t-2)]$$

$$= \frac{1}{2} [t(2) + 2t + 4 - 4t - 12]$$

$$= \frac{1}{2} |[-8]| = 4 \text{ sq unit}$$

13. If the points A(6,1), B(8,2), C(9, 4) and D(p, 3) are the vertices of a parallelogram, taken in order, then the value of p is -

(1) 6 (2) 7 (3) 8 (4) 9

Ans. [2]

Sol. \therefore mid point of AC = mid point of BD

$$\left(\frac{6+9}{2}, \frac{1+4}{2}\right) = \left(\frac{8+p}{2}, \frac{2+3}{2}\right)$$

$$\therefore \frac{15}{2} = \frac{8+p}{2} \Rightarrow p = 7$$

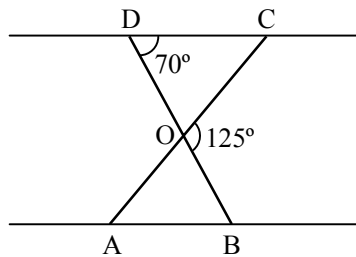
14. Sides of two similar triangles are in the ratio 4 : 9. Areas of these triangles are in the ratio -

(1) 2 : 3 (2) 4 : 9 (3) 81 : 16 (4) 16 : 81

Ans. [4]

$$\text{Sol. } \frac{\Delta_1}{\Delta_2} = \left(\frac{4}{9}\right)^2 = \frac{16}{81}$$

15. In the given figure, $\triangle ODC \sim \triangle OBA$, $\angle BOC = 125^\circ$ and $\angle CDO = 70^\circ$. Then $\angle OAB$ is -



(1) 50° (2) 55° (3) 60° (4) 65°

Ans. [2]

Sol. $\angle OCD = 125 - 70 = 55^\circ$

also $\triangle ODC \sim \triangle OBA$

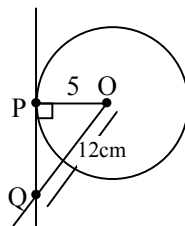
$\therefore \angle OAB = \angle OCD \therefore \angle OAB = 55^\circ$

16. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. The length of PQ is -

(1) 12 cm (2) 13 cm (3) 8.5 cm (4) $\sqrt{119}$ cm

Ans. [4]

Sol.



$$OP = 5 \text{ cm}$$

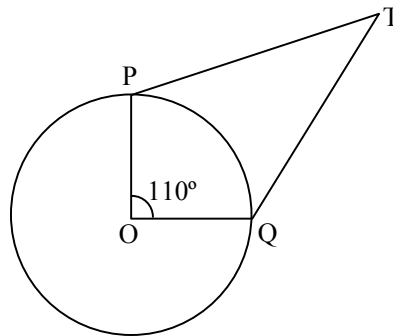
$$OQ = 12 \text{ cm}$$

\therefore In right $\angle \Delta$, OPQ

$$PQ^2 = 12^2 - 5^2$$

$$= 144 - 25 = \sqrt{119}$$

17. In the given figure, if TP and TQ are the two tangents to a circle with center O so that $\angle POQ = 110^\circ$, then $\angle PTQ$ is equal to -



(1) 60°

(2) 70°

(3) 80°

(4) 90°

Ans. [2]

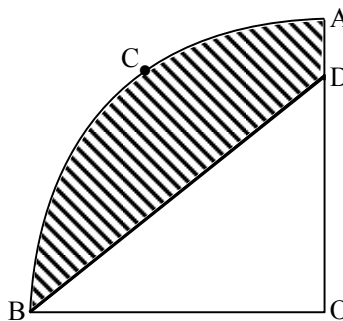
Sol. \therefore TP & TQ are two tangents on circle

$$\therefore \angle POQ + \angle PTQ = 180^\circ$$

$$\therefore 110^\circ + \angle PTQ = 180^\circ$$

$$\angle PTQ = 70^\circ$$

18. In the given figure, OACB is a quadrant of a circle with centre O and radius 3.5 cm. If OD = 2 cm, then the area of shaded region is -



(1) $\frac{49}{8} \text{ cm}^2$

(2) $\frac{49}{4} \text{ cm}^2$

(3) $\frac{69}{8} \text{ cm}^2$

(4) $\frac{69}{4} \text{ cm}^2$

Ans. [1]

Sol. Required area

= area of sector – area of Δ

$$= \frac{\pi r^2}{4} - \frac{1}{2}(\text{OB})(\text{OD})$$

$$= \frac{22}{7} \times \frac{1}{4} \times 3.5 \times 3.5 - \frac{1}{2}(3.5)(2)$$

$$= \frac{11}{2} \times 0.5 \times 3.5 - 3.5$$

$$= \left(\frac{5.5}{2} - 1\right) 3.5 = \frac{3.5 \times 3.5}{2} = \frac{12.25}{2} \times \frac{4}{4} = \frac{49}{8} \text{ cm}^2$$

19. Three cubes of sides 3 cm, 4 cm and 5 cm respectively are melt to form a big cube. Then the ratio of surface area of big cube with the surface area of three cubes combined together is -

(1) 2 : 1

(2) 3 : 2

(3) 25 : 18

(4) 27 : 20

Ans. [3]

Sol. $V_{\text{Big}} = V_1 + V_2 + V_3$

$$S^3 = 3^3 + 4^3 + 5^3 = 27 + 64 + 125$$

$$S^3 = 216 = 6^3$$

$$S = 6 \text{ cm}$$

$$\frac{A_{\text{Big}}}{A_1 + A_2 + A_3} = \frac{6S^2}{6(S_1^2 + S_2^2 + S_3^2)} = \frac{6^2}{3^2 + 4^2 + 5^2}$$

$$= \frac{6 \times 6}{9 + 16 + 25} = \frac{36}{50} = \frac{18}{25}$$

NOTE : ∴ According to question ratio is 18 : 25 but it is not in options.

20. If the surface area of a cube is 216 square metre then the volume of it is -

(1) 512 m³

(2) 480m³

(3) 216 m³

(4) 116m³

Ans. [3]

Sol. $6S^2 = 216$

$$6S^2 = 6^3$$

$$S = 6 \text{ cm}$$

$$\text{Vol.} = S^3$$

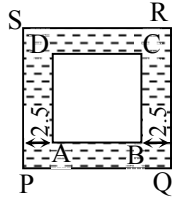
$$= 6 \times 6 \times 6 = 216 \text{ m}^3$$

21. If there is a way of 2.5 m width around a square field and the area of the way is 625 m^2 . Then what is the length of the square field ?

- (1) 60 m (2) 55 m (3) 50 m (4) 70 m

Ans. [1]

Sol.



$$\text{Area PQRS} - \text{area ABCD} = 625$$

$$(x + 5)^2 - x^2 = 25^2$$

$$(2x + 5)(5) = 625$$

$$2x + 5 = 125$$

$$2x = 120$$

$$x = 60 \text{ m}$$

22. Water in a canal of 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed for irrigation ?

- (1) 562500 m^2 (2) 526250 m^2
 (3) 552600 m^2 (4) 565656 m^2

Ans. [1]

Sol. $b = 6 \text{ m}$

$$h = 1.5 \text{ m}$$

$$\text{speed of water} = \frac{10 \text{ km}}{\text{hr}} = \frac{10000 \text{ m}}{60 \text{ min}}$$

$$\text{Vol. of water in river in 1 min} = \left(\frac{500}{3} \right) \text{ m} \times 6 \times 1.5 = 1500 \text{ m}^3$$

$$\therefore (\text{area which irrigate}) (\text{height}) = 1500$$

$$\Rightarrow (\text{area}) \left(\frac{8}{100} \text{ m} \right) = 1500$$

$$\Rightarrow \text{area} = \frac{1500 \times 100}{8} = 18,750 \text{ m}^2$$

$$\therefore \text{in 30 min } 18750 \times 30 = 562500 \text{ m}^2$$

23. The wickets taken by a bowler in 10 cricket matches are as follows :

2 6 4 5 0 2 1 3 2 3

The mode of the data is

(1) 3

(2) 2

(3) 4

(4) 0

Ans. [2]

Sol. Mode = 2

24. If three unbiased coins are thrown then the probability of getting exactly 2 heads is -

(1) $\frac{1}{4}$

(2) $\frac{5}{8}$

(3) $\frac{3}{8}$

(4) $\frac{7}{8}$

Ans. [3]

Sol. $S = \{HHH, HHT, HTH, THH, TTT, TTH, THT, HTT\}$

Favourable case = 3

Total case = 8

probability = $\frac{3}{8}$

25. One card is drawn from a well-shuffled deck of 52 cards. The probability that the card will not be an ace is -

(1) $\frac{1}{13}$

(2) $\frac{1}{4}$

(3) $\frac{3}{13}$

(4) $\frac{12}{13}$

Ans. [4]

Sol. \therefore there are 4 ace in 52 cards and card will not an ace

$\therefore P(\text{not ace}) = 1 - \text{probability of an ace.}$

$$= 1 - \frac{4}{52} = 1 - \frac{1}{13} = \frac{12}{13}$$

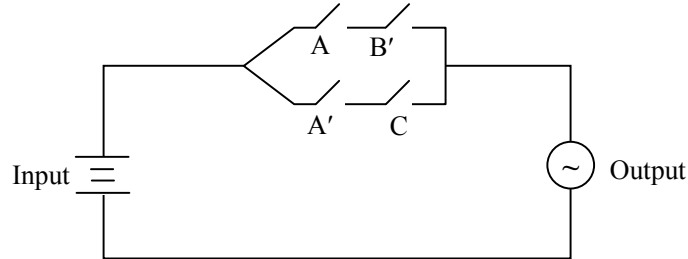
DAY TO DAY SCIENCE (Question Nos. 1 to 25)

1. On the surface of the moon, with no atmosphere, the temperature range is
(1) – 150°C to 110°C (2) – 4°C to 100°C
(3) – 273°C to 190°C (4) – 273°C to 110°C
Ans. [1]
2. In terms of distance from the sun the correct sequence of the following four planets is -
(1) Venus, mars, Earth, Jupiter (2) Earth, Venus, Mars, Jupiter
(3) Mars, Earth, Venus, Jupiter (4) Venus, Earth, Mars, Jupiter
Ans. [4]
3. Scientific name of long-sightedness is -
(1) Mpyoia (2) Night blindness (3) Hypermetropia (4) Presbyopia
Ans. [3]
4. Optical phenomenon responsible for blue colour of sky is -
(1) reflection (2) scattering (3) refraction (4) dispersion
Ans. [2]
5. Primary storage media is -
(1) Blue ray disk (2) Pen drive (3) Magnetic tape (4) Memory
Ans. [4]
6. The number of known vitamins till now is
(1) 6 (2) 13 (3) 19 (4) 26
Ans. [2]
7. The main constituent of bones is
(1) CaCO₃ (2) CaSO₄ (3) CaF₂ (4) Ca₃(PO₄)₂
Ans. [4]
8. Which of the following substances is commonly used as a refrigerant in fridge ?
(1) CFCl₃ (2) CCl₃Br (3) CF₂Cl₂ (4) CF₃Cl
Ans. [1]
9. The form of denatured proteins is
(1) milk (2) curd (3) butter (4) cheese
Ans. [2]
10. The most essential component of food is
(1) fat (2) carbohydrate (3) vitamin (4) protein
Ans. [2]

11. Inorganic and non-metallic polymer, which is prepared at high temperature is called -
 (1) ceramic (2) bakelite (3) rubber (4) glass

Ans. [1]

12. Mathematical form of electric circuit given below is -



- (1) $(A \cdot B') \cdot (A' + C)$ (2) $(A + B') \cdot (A' + C)$
 (3) $(A \cdot B') + (A' \cdot C)$ (4) $A + B' + A' + C$

Ans. [3]

13. In $a, b \in B$ the value of $(a + b) \cdot (a' \cdot b')$ is

- (1) 1 (2) 0 (3) a (4) b

Ans. [2]

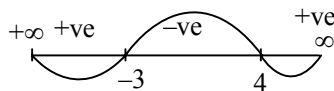
Sol. $(a + b) \cdot (\overline{a + b}) = 0$

14. The statement $x^2 - x - 12 < 0$ is equivalent to -

- (1) $x > 4, x < 4$ (2) $-3 < x < 4$ (3) $x < -3; x > 4$ (4) $-3 \leq x \leq 4$

Ans. [2]

Sol. $x^2 - 4x + 3x - 12 < 0$
 $x(x - 4) + 3(x - 4) < 0$
 $(x - 4)(x + 3) < 0$



$$-3 < x < 4$$

15. In binary system, the number 27 is written as

- (1) 10011 (2) 10101 (3) 11011 (4) 10111

Ans. [3]

Sol.

2	27	
2	13	1
2	6	1
2	3	0
2	1	1
	0	1

11011

16. Subtraction of the numbers $(1010110)_2$ and $(101101)_2$ is
 (1) $(110101)_2$ (2) $(111011)_2$ (3) $(101101)_2$ (4) $(100011)_2$

Ans. [Bonus]

Sol.

$$\begin{array}{r} {}^0 1 \ 0 \ 1 \ 0 \ 1 \ 1 \ 0 \\ \underline{1 \ 0 \ 1 \ 1 \ 0 \ 1} \\ 1 \ 0 \ 1 \ 0 \ 0 \ 1 \end{array}$$

$$\therefore (101001)_2$$

But it is not in any option so it should bonus.

17. Decimal equivalent of binary number $(1010111)_2$ is
 (1) 67 (2) 77 (3) 87 (4) 97

Ans. [3]

Sol. $2^6 \times 1 + 2^5 \times 0 + 2^4 \times 1 + 2^3 \times 0 + 2^2 \times 1 + 2^1 \times 1 + 2^0 \times 1$
 $64 + 16 + 4 + 2 + 1 = 87$

18. The secretion of ductless glands is known as
 (1) Enzyme (2) Digestive juice (3) Mucous (4) Hormone

Ans. [4]

19. Hydrogen atoms are used in -
 (1) CT-scan (2) ECG (3) MRI (4) RIA

Ans. [3]

Sol. The MRI machine is a large, cylindrical (tube-shaped) machine that creates a strong magnetic field around the patient. This magnetic field, along with a radiofrequency, alters the hydrogen atoms' natural alignment in the body. Computers are then used to form two-dimensional (2D) images of a body structure of organ based on the activity of the hydrogen atoms

20. Circular DNA present in some bacterial cell is known as
 (1) z-DNA (2) Plasmid (3) Exonuclease (4) Endonuclease

Ans. [2]

21. Marine alga 'Nori' (Porphyra sps.) has
 (1) Sugar – Vitamin A – Nitrogen
 (2) Protein – Vitamin C – Iodine
 (3) Fat – Vitamin D – Phosphorus
 (4) Protein – Vitamin K – Iodine

Ans. [2]

22. Four couples are claiming their right on a baby. Which has O blood group. The blood group of the real parents of the baby will be

- (1) Father $I^A I^O$, Mother $I^B I^O$
- (2) Father $I^B I^O$, Mother $I^A I^B$
- (3) Father $I^O I^O$, Mother $I^A I^B$
- (4) Father $I^A I^O$, Mother $I^A I^A$

Ans. [1]

23. Which compound is used for staining the DNA fragment, isolated during electrophoresis technique ?

- (1) Leishmann's stain
- (2) Giemsa's stain
- (3) Wright's stain
- (4) Ethyidium bromide

Ans. [4]

24. The chemical used in bloodless surgery is

- (1) Colchicine
- (2) Phenol
- (3) Mustard gas
- (4) Visual Argon ion

Ans. [4]

Sol. Also known as laser surgery.

25. The state plant of Rajasthan is

- (1) Tecmelia undulate
- (2) Tectona grandis
- (3) Prosopis cineraria
- (4) Dalbergia sisso

Ans. [3]

General Knowledge Regarding Science (Question Nos. 1 to 25)

1. The height of geostationary satellite from earth's surface is about
(1) 6400 km (2) 36000 km (3) 42000 km (4) 3600 km

Ans. [2]

2. A device which can transmit the radio and TV signals in different directions after receiving them is known as
(1) Receiver (2) Transporter (3) Transponder (4) Transmitter

Ans. [4]

3. Which of the following is used to fabricate solar cell ?
(1) Si (2) P (3) C (4) Ge

Ans. [1, 4]

Sol. Both are used in solar cell.

4. A car accelerates uniformly from 18 km/h to 36 km/h in 10 s. The distance covered by the car in that time will be -
(1) 25 m (2) 50 m (3) 75 m (4) 100 m

Ans. [3]

Sol. $u = 18 \text{ km/hr} = 18 \times \frac{5}{18} = 5 \text{ m/s}$

$$v = 36 \text{ km/hr} = 36 \times \frac{5}{18} = 10 \text{ m/s}$$

$$a = \frac{10 - 5}{10} = \frac{5}{10} \text{ m/s}^2$$

$$S = ut + \frac{1}{2}at^2$$

$$= 5 \times 10 + \frac{1}{2} \times \frac{5}{10} \times 10 \times 10$$

$$= 50 + 25$$

$$= 75 \text{ m}$$

5. The name of the first India satellite put in the geostationary orbit is
(1) APPLE (2) INSAT-IA (3) INSAT-IB (4) Aryabhata

Ans. [2]



6. Which transmission medium is the fastest ?

- (1) Wireless (2) Fibre optic cable
(3) Twisted pair cable (4) Coaxial cable

Ans. [2, 3]

Sol. Optical fiber in guided medium, wireless in unguided medium.

7. Which of the following planets does not have natural satellite ?

- (1) Saturn (2) Mars (3) Venus (4) Jupiter

Ans. [3]

8. If a snake bites your younger brother, then your duty for patient is

- (1) to do worship of snake (2) to bring the patient at hospital
(3) to do domestic treatment (4) to do worship of God

Ans. [3]

9. Which one of the following substances is supercooled liquid ?

- (1) Salt (2) Sugar (3) Rubber (4) Iron

Ans. [3]

10. The metal ion present in Haemoglobin is

- (1) Zn^{2+} (2) Mg^{2+} (3) Co^{2+} (4) Fe^{2+}

Ans. [4]

11. Leaching is a process

- (1) of purification (2) of concentration (3) of reduction (4) of oxidation

Ans. [1]

12. Substances which affect the nervous system are called

- (1) Antipyretic (2) Analgesic (3) Antibiotic (4) Tranquillizer

Ans. [2]

13. According to newspapers "It is not possible to determine the sex of the baby in the womb by sonography test of a pregnant woman in a private hospital". It is due to

- (1) It is harmful for lady (2) It is harmful for child
(3) It is banned by law (4) It is not easily possible

Ans. [3]

14. The value of A in the series 6, 11, 21, A, 81 is

(1) 27

(2) 41

(3) 51

(4) 49

Ans. [2]

Sol.

6, 11, 21, A, 81

$$\begin{array}{r} \times 2-1 \\ \times 2-1 \\ \times 2-1 \\ 41 \\ 2 \end{array}$$

$$6 \times 2 - 1 = 11$$

$$11 \times 2 - 1 = 21$$

$$21 \times 2 - 1 = 41 \quad \therefore A = 41$$

$$41 \times 2 - 1 = 81$$

15. Arrange the following ratios in the descending order and choose the correct answer :

$$\frac{2}{3}, \frac{4}{5}, \frac{3}{8}, \frac{1}{2}$$

(1) $\frac{4}{5}, \frac{2}{3}, \frac{1}{8}, \frac{3}{8}$

(2) $\frac{2}{3}, \frac{4}{5}, \frac{3}{8}, \frac{1}{2}$

(3) $\frac{4}{5}, \frac{1}{2}, \frac{3}{8}, \frac{2}{3}$

(4) $\frac{4}{5}, \frac{3}{8}, \frac{2}{3}, \frac{1}{2}$

Ans. [1]

Sol.

$$\frac{2}{3} \quad \frac{4}{5} \quad \frac{3}{8} \quad \frac{1}{2}$$

$$80 \quad 96 \quad 45 \quad 60$$

$$\frac{4}{5} \quad \frac{2}{3} \quad \frac{1}{2} \quad \frac{3}{8}$$

$$= \quad = \quad = \quad =$$

NOTE : This may be bonus

\therefore Option (1) contain $\frac{1}{8}$ but it should be $\frac{1}{2}$

16. The difference between the five digit biggest and lowest numbers made out by the following digits 0, 2, 3, 6 and 7 using the digits only once is

(1) 35905

(2) 50935

(3) 55953

(4) 95821

Ans. [3]

Sol. 0, 2, 3, 6, 7

Largest 7 6 3 2 0

Smallest 2 0 3 6 7

\therefore difference : 7 6 3 2 0 - 2 0 3 6 7

= 5 5 9 5 3

17. Three years ago, the average age of X and Y was 18 years. After the arrival of Z, it raised up to 22 years. What was the age of Z ?

- (1) 30 years (2) 26 years (3) 29 years (4) $29\frac{1}{2}$ years

Ans. [1]

Sol. Let ages of x, y, z. Three years ago were a, b, & c years

$$\text{and } \frac{a+b}{2} = 18$$

$$\therefore a+b = 36 \text{ _____ (1)}$$

$$\text{also } \frac{a+b+c}{3} = 22$$

$$a+b+c = 66$$

$$c = 66 - 36$$

$$c = 30 \text{ years}$$

18. 'World Health Day' is celebrated on

- (1) 5th June (2) 11th July (3) 16th September (4) 7th April

Ans. [4]

19. 'Cyclone collector' is used to control

- (1) Air pollution (2) Water pollution
(3) Radioactive pollution (4) Noise pollution

Ans. [1]

20. Plants die due to flood, because their

- (1) Cell sap becomes thin (2) Cell sap becomes concentrate
(3) Respiration is stopped in roots (4) Nutrients exude from the plant

Ans. [3]

21. Mother's milk is beneficial for infant because it has

- (1) Potassium ions (2) Antibodies (3) Bicarbonates (4) Calcium ions

Ans. [2]

22. The useful fruit considered for the treatment of cancer is

- (1) Orange (2) Watermelon (3) Papaya (4) Mango

Ans. [3]



23. Which of the following pancreatic cells are responsible for synthesizing insulin ?
(1) Alpha (2) Beta (3) Gamma (4) Delta

Ans. [2]

24. Pink and Round Revolution are related to
(1) Fish and Milk (2) Oil seeds and Egg
(3) Prawn and Potato (4) Horticulture and Tomato

Ans. [3]

25. The unit used for measuring the thickness of ozone in air column from lower level to upper level of atmosphere is
(1) Decibel (2) Dobson (3) ppm (4) Angstrom

Ans. [2]