PHYSICS

Q 1) An experiment is done to observe the effect of gravity on the earth and the moon. An object is shifted to the surface of the moon in a mission launched by a space agency. The mass of the object on the surface of the earth is 25 kg. (Acceleration due to gravity on the surface of the earth, g = 10 m/s^2). What is the weight of the object on the surface of the moon where the acceleration due to gravity is g/6?

(a) 41.6 (b) 83.3 (c) 50.9 (d) 20.3

Q 2) How can we write mechanical power in a manner similar to the electrical power of 1500 Watts?

(a) 1 hp (b) 2 hp (c) 3 hp (d) 4 hp

Q 3) If the current I through a resistor is increased by 100% the increased in power dissipation will be (assume temperature remains unchanged)

(a) 100% (b) 200% (c) 150 % (d) 250%

Q 4) If we drop a feather and a heavy stone in a vacuum chamber at the same time from the same height. Which will reach the ground first? The value of g is the same for all objects at a given place on the earth

(a) Feather will reach the ground first (b) Heavy stone will reach the ground first

(c) Both reach the ground at the same time (d) Feather will not reach ground ever

Q 5) The human eye can focus objects at different distances by adjusting the focal length of the eye lens. This is due to

(a) Far-sightedness (b) Near-sightedness (c) Presbyopia (d)Accommodation

Q 6) Consider a straight conductor then the strength of the magnetic field around it is

(a) Is the same everywhere around the conductor

(b) Obeys the inverse square law

(c) Is directly proportional to the square of the distance from the conductor

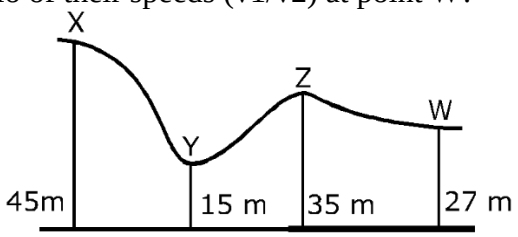
(d) None of these

Q 7) A positively charged plate and a negatively charged plate are kept parallel to each other at 20 cm. An electron is released near the negative plate. Looking from the negative plate towards the positive plate, the magnetic field produced by the moving electron will be:

(a) Clockwise (b) anti-clockwise

(c) positive to the negative plate (d) negative to the positive plate

Q 8) Two balls A and B are released towards point W from point X and point Z respectively, on a perfectly smooth track as shown in the figure. The balls move along the track without losing contact. What will be the ratio of their speeds (v1/v2) at point W?



(a) 1 (b) 1/2 (c) 2/3 (d) 3/2

Q 9) Internal energy of a system is defined as?

(a) The sum of kinetic energies of all molecules of the system

(b) The sum of kinetic and potential energies of all molecules of the system

(c) The sum of potential energies of the system

(d) The average kinetic energy of all molecules

Q 10) A ball is thrown up in the sky. After reaching a height, the ball falls back. What can be said about the average velocity?

(a) It is non zero (b) It is zero (c) It is greater than zero (d) It is less than zero

Q 11) The radius of curvature of a concave mirror is 14cm. Then focal length will be?

(a) 14cm (b) -7cm (c) -14cm (d) 7cm

Q 12) Which of the following properties of a proton can change when it moves freely in a magnetic field

(a) Mass (b) Speed (c) Velocity (d) Acceleration

CHEMISTRY

Q 13) 1.80 g of glucose (C6H12O6) was dissolved in 36g of water. The number of oxygen atom in solution are:
(a)6.68 × 1023 (b) 12.40 × 1022 (c) 6.68 × 1022 (d) 12.40 × 1023

Q 14) Equal volumes of solutions containing 1 mole of an acid and 1 mole of a base respectively are mixed. Which of these mixtures will give pH more than 7?
(a) Sodium hydroxide + Acetic acid (b) Potassium hydroxide + Sulphuric acid
(c) Ammonium hydroxide + Sulphuric acid (d)Sodium hydroxide + Hydrochloric acid

Q 15) During cellular respiration which type of reaction takes place
(a) Only Oxidized reaction (b) Only Reduced reaction
(c) Redox reaction (d) Neutralization reaction

Q 16) $A^+ + B \rightarrow A + B^+$. Reducing agent is:
(a) A (b) B (c) Both of them (d) None of them

Q 17) Which of the following is a saturated hydrocarbon?
(a) C_2H_4 (b) C_2H_2 (c) C_2H_6 (d) C_4H_4

Q 18) In _____ state NaCl is a bad conductor of electricity, and in ____ state NaCl is a good conductor of electricity
(a) Solid, vapour (b) Vapour, molten (c) Molten, solid (d) Solid, molten

Q 19) The gas given off when a metal reacts with an acid is
(a) Hydrogen (b) Oxygen (c) Carbon dioxide (d) Water vapour

Q 20) Prevention of corrosion of iron by Zn coating is called
(a) Alloying (b) Electrolysis (c) Soldering (d) Galvanization

Q 21) A Magnesium ribbon is burnt in oxygen to give a white compound X accompanied by the emission of light. If the burning ribbon is now placed in an atmosphere of nitrogen, it continues to burn and forms a compound Y. write the chemical formula of X and Y :
(a) X → MgO; Y → MgN (b) X → 2MgO; Y → Mg_2N_3
(c) X → MgO; Y → Mg_3N_2 (d) None of these

Q 22) Which of the following is not a decomposition reaction?
(a) $CaCO_3 \rightarrow CaO + CO_2$ (b) $2KClO_3 \rightarrow 2KCl + 3O_2$
(c) $2NaNO_3 \rightarrow 2NaNO_2 + O_2$ (d) $H_2 + Cl_2 \rightarrow 2HCl$

Q 23) Metal oxide + water → _____
(a) Acid (b) Base (c) Salt (d) None of these

Q 24) Which of the following is endothermic reaction
(a) A match stick burns (b) Ice melts
(c) Molten metal solidifies (d) Sodium reacts with water

Maths

Q 25) Three unbiased coins are tossed. What is the probability of getting at most 2 tails.
(a) 1/2 (b) 5/8 (c) 7/8 (d) 1/4

Q 26) The distance between the point P (1, 4) and Q (4, 0) is
(a) 4 (b) 5 (c) 6 (d) $3\sqrt{3}$

Q 27) The area of the triangle whose vertices are A (1, 2), B (-2, 3) and C (-3, -4) is
(a) 11 (b) 22 (c) 33 (d) 21

Q 28) The slant height of a cone is 13cm and radius is 5cm. then its height is
(a) 5 cm (b) 22 cm (c) 12 cm (d) 18 cm

Q 29) The discriminant (D) of $\sqrt{x^2 + x + 1} = 2$ is
(a) – 3 (b) 13 (c) 11 (d) 12

Q 30) In an Arithmetic Progression, if a = 28, d = -4, n = 7, then a_n is:
(a) 4 (b) 5 (c) 3 (d) 7

Q 31) A shuttle cock used for playing badminton has the shape of the combination of
(a) A cylinder and a sphere (b) A cylinder and a hemisphere
(c) A sphere and a cone (d) Frustum of a cone and a hemisphere

Q 32) Two dice are thrown simultaneously. Select the correct option
(a) The probability of not getting doublet is 5/6
(b) The probability of getting a total of atleast 10 is 1/6
(c) The probability of not getting a total as a perfect square is 29/36
(d) All of the above

Q 33) The value of the discriminant of the equation $x^2 + 10x - 7 = 0$ is
(a) 130 (b) 120 (c) 128 (d) 0

Q 34) The nature of roots of the quadratic equations $x^2-4x+4=0$ is
(a) Real and Equal (b) Real and Unequal
(b) Are not Real (c) None.

Q 35) The value of (sin 45° + cos 45°) is
(a) $1/\sqrt{2}$ (b) $\sqrt{2}$ (c) $\sqrt{3}/2$ (d) 1A

Q 36) value of (1 + tan2 A)/ (1 + cot2 A) is
(a) $\cot^2 A$ (b) $\cos^2 A$ (c) $\tan^2 A$ (d) $\sin^2 A$

BIO

Q 37) Which of the following is not correct
(a) For every hormone there is a gene
(b) For every protein there is a gene
(c) For the production of every enzyme there is a gene
(d) For every molecule of fat there is a gene

Q 38) Assertion: In human beings, the female. play a major role in determining the sex of the offspring
Reason: Women have two X chromosomes
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is not the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

Q 39) Plants like banana, rose, jasmine, orange have lost the capacity to produce
(a) Seeds (b) Buds (c) Flower (d) Roots

Q 40) The flower of the Hibiscus plant is
(a) Bisexual (b) Unisexual (c) Neuter (d) Very small

Q 41) 3-R's that help to converse natural resources are:
(a) Reuse, reduce, recycle (b) Reuse, redistribute, recycle
(c) Reduce, ration, regenerate (d) All of the above

Q 42) Which of the following organisms does not have a cell?
(a) Virus (b) Bacteria (c) Fungi (d) Algae

Q 43) Which of the following correctly represents the passage of food in our body?
(a) Mouth → Stomach → Food Pipe → Small intestine
(b) Mouth → Stomach → Small intestine → Food Pipe
(c) Mouth → Small intestine → Stomach → Food Pipe
(d) Mouth → Food Pipe → Stomach → Small intestine

Q 44) The longest part of the alimentary canal is
(a) Oesophagus (b) Large intestine (c) Small intestine (d) Stomach

Q 45) Nephrons are related to
(a) Respiratory system (b) Circular system
(c) Excretory system (d) Integumentary system

Q 46) When the right ventricle contracts the blood goes into
(a) Aorta (b) Brain (c) Pulmonary artery (d) None

Q 47) At the time of inspiration, _____ takes place.
(a) relaxation in external intercostal muscle (b) relaxation in diaphragm
(c) contraction in diaphragm (d) no effect on diaphragm

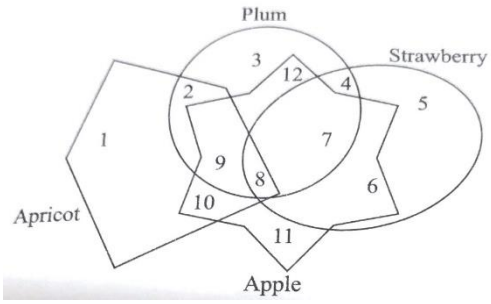
Q 48) Which of the functions are performed by the ovaries?

(a) Formation of ovum (b) Secretion of Progesterone
(c) Secretion of Estrogen (d) All of the above

Logical

Q 49) The code for the word HOWDY in a certain language is GPVEX. How would you code BROWNIE in this language?
(a) ASNWMJD (b) BSNWNJF (c) BTMVNJF (d) ASNXMJD

Direction For Q.50.
In the following circle ellipse, Pentagon and dodecagon represent the regions of Plum, strawberry apricot and apple plantation n respectively. On the basis of above information answer the following figure from Book.



Q 50) Which area has plantation of apple only?
(a) J (b) 1 (c) 2 (d) 11

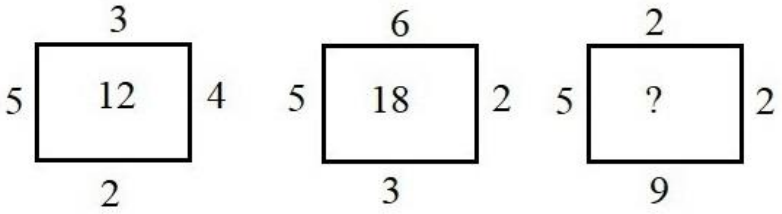
Q 51) If
(i) X + Y means X; 'is the husband of' Y
(ii) X ÷Y means X 'is the sister of' Y
(iii) X × Y means X 'is the son of ' Y,
Then which of the following shows that P is the daughter of Q?
(a) R × Q ÷ P (b) Q + R × P (c) S × Q + R ÷ P (d) P ÷ S × Q

Direction For Q. No. 52.
There are five men A, B, C, D and E and six women P,Q. R, S, T and U, A, B and R are advocates; C, D, P, Q, and S are doctors and the rest are teachers, Some teams are to be selected from amongst these eleven persons subject to the following conditions:
(i) A, P and U have to be together (ii) B, Cannot go with D or R
(iii) E, and Q have to be together (iv) C and T have to be together
(iv) D and P cannot go together (v) D and P cannot go together
(vi) C cannot go with Q.

Q 52) If the team is to consist of two male advocates, two lady doctors and one teacher, the members of the team are :
(a) A, B, P, Q, U (b) A, B, P, U, S
(c) A, P, R, S, U (d) B, E, Q, R, S

Q 53) Find the missing term in the following series.
0, 2, 8, 14, ?, 34
(a) 20 (b) 23 (c) 24 (d) 25

Q 54) In the following questions, a set of figures carrying certain characters is given. Assuming that the characters in each set follow a similar pattern, find the missing character in each case.

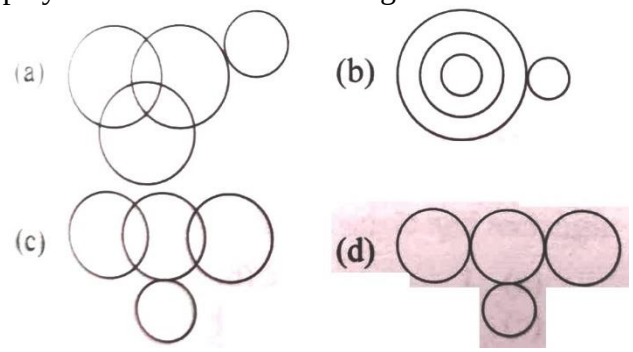


(a) 15 (b) 16 (c) 17 (d) 18

Q 55) Select the number which is different from others.
(a) 12 (b) 24 (c) 48 (d) 59

Q 56) In a certain code language, HAND is written as SZMW, then what will be the code of MILK?
(a) ORNP (b) PNRO (c) NROP (d) RNOP

Q 57) In a class of 46 students, 18 played football, 17 played cricket including 6 who played football. Sixteen students played hockey including 4 who played cricket, but not football. Five students played carom but no outdoor games. Which of the following figures represents these facts?



Q 58) Ajay ranked sixteenths from the top and twenty-ninth from the bottom among those who passed an examination. Six boys did not participate in the competition and five failed in it. How many boys were there in the class?
(a) 40 (b) 44 (c) 50 (d) 55

Q 59) In a certain office, $\frac{1}{3}$ of the workers are women $\frac{1}{2}$ of the women are married and $\frac{1}{3}$ of the married women have children. If $\frac{3}{4}$ of the men are married and $\frac{2}{3}$ of the married men have children, what parts of the workers are without children?
(a) $\frac{5}{18}$ (b) $\frac{4}{9}$ (c) $\frac{11}{18}$ (d) None of these

For Direction Q. No. 60.
Focal length of a lens having two curved surfaces whose radii of curvatures are R1 and R2 is given by relation $\frac{1}{f}=\left(\frac{\mu_l-\mu_m}{\mu_m}\right)\left(\frac{1}{R_1}-\frac{1}{R_2}\right)$ where μ_1 is refracting index of material of lens and μ_m is refractive index of medium in which the lens is placed R_1 and R_2 and measured as per sign convention. [When measured in the direction of light will be +ve and in opposite direction it will be negative].

Q 60) A thin double convex lens has radii of curvature each of magnitude 40 cm and is made of glass with refractive index 1.65. Its focal length is nearly
(a) 20 cm (b) 31 cm (c) 35 cm (d) 50 cm

SPATIAL

Q 61) The correct set of conduction for liquefaction of gases is
(a) High temperature and low pressure
(b) Low temperature and low pressure
(c) Low temperature and high pressure
(d) High temperature and high pressure

Q 62) Which of the following are heterogeneous in nature?
(i) Dry ice (ii) Wood (iii) Soil
Codes :
(a) (i) and (iii) (b) (ii) and (iv) (c) (ii) and (iii) (d) (iii) and (iv)

Q 63) Which of the following statements (s) about the modern periodic table is/are incorrect?
(i) The elements in the modern periodic table are arranged on the basic of their decreasing atomic number
(ii) The elements in the modern periodic table are arranged on the basic of their increasing atomic masses
(iii) Isotopes are placed in adjoining group(s) in the periodic table
(iv) The elements in the modern periodic table are arranged on the basic of their increasing atomic number
(a) only (i) (b) (i), (ii) and (iii)
(c) (i), (ii) and (iv) (d) Only (iv)

Q 64) The reaction in which a more reactive element displaces a less reactive element from its salt solution is called
(a) Displacement reaction (b) Double decomposition reaction
(c) Decomposition reaction (d) Synthesis reaction

Q 65) Which of the following property is not exhibited by homologues?
(a) They differ by a CH_2 group
(b) They differ by 14 mass units
(c) They all contain double bond
(d) They are represented by the same a general formula

Q 66) The luster of metal is due to
(a) Its high density (b) Its high malleability
(c) Its high ductility (d) The presence of free electrons

Comprehension

Q 67) 3 pumps, working 8 hours a day, can empty a tank in 2 days. How many hours a day must 4 pumps work to empty the tank in 1 day?
(a) 9 (b) 10 (c) 11 (d) 12

Q 68) Study the following pie-chart and the table and answer the questions based on them. Proportion of Population of Seven Villages in 1997

Village	% Population Below Poverty Line
X	38
Y	52
Z	42
R	51
S	49
T	46
V	58

If the population of village R in 1997 is 32000, then what will be the population of village Y below poverty line in that year?
(a) 14100 (b) 15600 (c) 16500 (d) 17000

Q 69) A bag contains 5 red balls and 'n' green balls. If the probability of drawing a green ball is three times that of a red ball then what is the value of 'n'?
(a) 15 (b) 10 (c) 18 (d) 12

Q 70) Which term of the A.P. 24, 21, 18, ... is the first negative term?
(a) 8^{th} (b) 9^{th} (c) 10^{th} (d) 12^{th}

Q 71) The decimal expansion of 141/120 will terminate after how many places of decimals?
(a) 1 (b) 2
(c) 3 (d) will not terminate

Q 72) If two bodies of different masses, initially at rest, are acted upon by the same force for the same time, then the both bodies acquire the same
(a) Velocity (b) Momentum (c) Acceleration (d) Kinetic energy

Calculation

Q 73) (935421 x 625) = ?
(a) 575648125 (b) 584638125 (c) 584649125 (d) 585628125

Q 74) What decimal of an hour is a second?
(a) .0025 (b) .0256 (c) .00027 (d) .000126

Q 75) One fathom is equal to
(a) 6 feet (b) 6 meters (c) 60 feet (d) 100 cm

Q 76) One horse power is equal to
(a) 746 watts (b) 748 watts (c) 756 watts (d) 736 watts

Q 77) Actinides are the elements with atomic numbers from
(a) 97 to 104 (b) 101 to 115 (c) 89 to 103 (d) 36 from 43

Q 78) The atomic masses of three elements A, B and C having similar chemical properties are 7, 23 and 39 respectively calculate the average atomic mass of elements A & C:
(a) 13 (b) 23 (c) 46 (d) 28

English

Passage For Q No. 79 to 82

Urban services have not expanded fast enough to cope with urban expansion. Low investment allocations have tended to be under spent. Both public (e.g. Water and sewage) and private (e.g. Low income area housing) infrastructure quality has declined. The impact of the environment in which children live and the supporting services available to them when they fall ill, seems clear. The decline in average food availability and the rise in absolute poverty, point in the same unsatisfactory directions.

Q 79) There is nothing to boast about urban services
(a) If the inference is definitely true, i.e. it properly follows from the statement of facts given
(b) If the inference is probably true though not definitely true in the light of the facts given
(c) If the data are inadequate i.e. from the facts given you cannot say whether the inference is likely to be true or false
(d) If the inference is definitely false i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts

Q 80) The public transport system is in the hand of private sector
(a) If the inference is definitely true, i.e. it properly follows from the statement of facts given
(b) If the inference is probably true though not definitely true in the light of the facts given
(c) If the data are inadequate i.e. from the facts given you cannot say whether the inference is likely to be true or false
(d) If the inference is definitely false i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts

Q 81) Birth rate is higher in urban areas as compared to rural areas
(a) If the inference is definitely true, i.e. it properly follows from the statement of facts given
(b) If the inference is probably true though not definitely true in the light of the facts given
(c) If the data are inadequate i.e. from the facts given you cannot say whether the inference is likely to be true or false
(d) If the inference is definitely false i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts

Q 82) Low cost urban housing is on the priority

(a) If the inference is definitely true, i.e. it properly follows from the statement of facts given
(b) If the inference is probably true though not definitely true in the light of the facts given
(c) If the data are inadequate i.e. from the facts given you cannot say whether the inference is likely to be true or false
(d) If the inference is definitely false i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts

Passage For Q No. 83 & 84

There is some controversy about the percentage of population below the poverty line in India. The criteria for the poverty line is basis on person's nutritional requirement is terms of calories. It is assumed that the minimum nutritional requirement per person per day in rural areas is 2400 calories whereas it is 2200 calories in urban areas. If the household is unable to bear the expenditure for this level of nutrition, it is categorized as below the poverty line. There is also a view that along with calories, the amount of protein intake be treated as criterion as it is related to physical energy, mental alertness and resistance to infection.

Q 83) Many Indians, who below the poverty line, get necessary amount of proteins.

(a) If the inference is definitely true, i.e. it properly follows from the statement of facts given
(b) If the inference is probably true though not definitely true in the light of the facts given
(c) If the data are inadequate i.e. from the facts given you cannot say whether the inference is likely to be true or false
(d) If the inference is definitely false i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts

Q 84) People living above the poverty line are less likely to suffer from infections

(a) If the inference is definitely true, i.e. it properly follows from the statement of facts given
(b) If the inference is probably true though not definitely true in the light of the facts given
(c) If the data are inadequate i.e. from the facts given you cannot say whether the inference is likely to be true or false
(d) If the inference is definitely false i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts