INDIAN ASSOCIATION OF PHYSICS TEACHERS

National Standard Examination in Junior Science – 2024

Date of Examination December 22, 2024

Time: 2:30 PM to 4:30 PM

Question Paper Code: 55

Student's Roll No:											

Write the Question Paper Code (mentioned above) on YOUR OMR Answer Sheet (in the space provided), otherwise your Answer Sheet will NOT be evaluated. Note that the same Question Paper Code appears on each page of the Question Paper.

Instructions to Candidates:

1. Use of mobile phone, smart watch, and iPad during examination is STRICTLY **PROHIBITED.**
2. In addition to this Question Paper, you are given OMR Answer Sheet along with candidate's copy.
3. On the OMR sheet, make all the entries carefully in the space provided **ONLY** in **BLOCK CAPITALS** as well as by properly darkening the appropriate bubbles.
   Incomplete/ incorrect/ carelessly filled information may disqualify your candidature.
4. On the OMR Answer Sheet, use only **BLUE or BLACK BALL POINT PEN** for making entries and filling the bubbles.
5. Your **Eleven-digit roll number and date of birth** entered on the OMR Answer Sheet shall remain your login credentials means login id and password respectively for accessing your performance / result in National Standard Examination in Junior Science 2024.
6. Question paper has two parts. In part A-1 (Q. No.1 to 48) each question has four alternatives, out of which **only one** is correct. Choose the correct alternative and fill the appropriate bubble, as shown.

   Q.No.12 

   c

   In part A-2 (Q. No. 49 to 60) each question has four alternatives out of which any number of alternative(s) (1, 2, 3, or 4) may be correct. You have to choose **all** correct alternative(s) and fill the appropriate bubble(s), as shown

   Q.No.52 

7. Attempt all sixty questions. For **Part A-1,** each correct answer carries 3 marks whereas 1 mark will be deducted for each wrong answer. In **Part A-2,** you get 6 marks if all the correct alternatives are marked and no incorrect. No negative marks in this part.
8. Rough work should be done in the space provided. There are **12** printed pages in this paper
9. Calculator is **not** allowed.
10. No candidate should leave the examination hall before the completion of the examination.
11. After submitting answer paper, take away the question paper & candidate's copy of the OMR for your future reference.

Please DO NOT make any mark other than filling the appropriate bubbles properly in the space provided on the OMR Answer Sheet.

OMR Answer Sheets are evaluated using machine, hence CHANGE OF ENTRY IS NOT ALLOWED. Scratching or overwriting may result in a wrong score.

DO NOT WRITE ON THE BACK SIDE OF THE OMR ANSWER SHEET.

Instructions to Candidates (Continued) :
You may read the following instructions after submitting the Answer Sheet.

12. **Comments/Inquiries/Grievances regarding this question paper, if any, can be shared on the Inquiry/Grievance column on www.iapt.org.in on the specified format till Dec 26, 2024**

13. **The Answers/Solutions to this Question Paper will be available on the website: www.iapt.org.in by Dec 24, 2024.** The score card may be downloaded after Dec 30, 2024

14. **CERTIFICATES and AWARDS:**
Following certificates are awarded by IAPT to students, successful in the National Standard Examination in Junior Science – 2024
(i) "CENTRE TOP 10 %" To be downloaded from iapt.org.in after 30.01.25
(ii) "STATE TOP 1 %" Will be dispatched to the examinee
(iii) "NATIONAL TOP 1 %" Will be dispatched to the examinee
(iv) "GOLD MEDAL & MERIT CERTIFICATE" to all students who attend OCSC – 2025 at HBCSE Mumbai
Certificate for centre toppers shall be uploaded on iapt.org.in

15. List of students (with centre number and roll number only) having score above **Minimum Admissible Score** will be displayed on the website: **www.iapt.org.in** by **Dec 28, 2024. See the MAS** clause on the student's brochure on the web.

16. List of students eligible to appear for Indian National Junior Science Olympiad (INJSO – 2025) shall be displayed on **www.iapt.org.in** by Dec 31, 2024.

Physical constants you may need….

Mass of electron $m_e = 9.11\times10^{-31}\,kg$	Magnitude of charge on electron $e = 1.60\times10^{-19}\,C$
Mass of proton $m_p = 1.67\times10^{-27}\,kg$	Planck's constant $h = 6.625\times10^{-34}\,Js$
Acceleration due to gravity g = 9.81 ms^{-2}	Density of water is $\rho = 1.0\times10^{3}\,kg\,m^{-3}$
Universal gravitational constant $G = 6.67\times10^{-11}\,Nm^2kg^{-2}$	$(1+x)^n \approx 1+nx$, if $\lvert x\rvert \ll 1$
Universal gas constant $R = 8.31\ J\,mol^{-1}\,K^{-1}$	1 eV = 1.6 × 10^{-19} J
Boltzmann constant $k = 1.38\times10^{-23}\,J\,K^{-1}$	$\sin(A\pm B) = \sin A\cos B \pm \cos A\sin B$
Avogadro's constant $A = 6.02\times10^{23}\,mol^{-1}$	$E = mc^2$ gives mass and energy equivalence.
Atmospheric pressure (at STP) = 1.013 × 10^5 Nm^{-2}	One unit of electric power = 1kWh
Speed of light in free space $c = 3.0\times10^{8}\,ms^{-1}$	

INDIAN ASSOCIATION OF PHYSICS TEACHERS
NATIONAL STANDARD EXAMINATION IN JUNIOR SCIENCE
(NSEJS – 2024)

Time: 120 minute **Max. Marks: 216**

Attempt All Sixty Questions

A – 1

OUT OF THE FOUR OPTIONS ONLY ONE IS CORRECT. BUBBLE THE CORRECT OPTION.

1. The mature megagametophyte (Embryo sac) generally has 8 nuclei; 3 egg cells, 1 secondary nucleus and 3 antipodal cells. What kind of embryo sac is found in *Polygonum*?
   (a) Monosporic (b) Bisporic (c) Trisporic (d) Tetrasporic

2. Various plant parts respond to different stimuli *e.g.*, light, gravity, moisture, touch, chemical etc. by growing unequally on the two sides of their organs. A student observed a bottle gourd plant twined around the branches of an adjacent tree while growing close to it. What type of response is it?
   (a) Gravitropism (b) Thigmotropism (c) Nyctinasty (d) Thigmonasty

3. DNA can exist in various double helical forms. Characteristics of these different forms of DNA are given in the following table under the **CODES** – Q, R, S and T, respectively.

Helix Form	Base pairs per turn	Rotation per base pair	Vertical Rise per base pair (*h*)	Helix Diameter
Q	12	-30.0°	5.7Å	18.4Å
R	10	+36.0°	3.4Å	23.7Å
S	10	+38.6°	3.3Å	23.7Å
T	11	-32.7°	2.3Å	25.5Å

   Correlate the characteristics with the **CODE** which shows left-handed helix and which follows the Watson - Crick Model. Choose the correct option:
   (a) R & S (b) S & T (c) Q & S (d) Q & R

4. Which of the following statements is **not** correct?
   (a) Two or more species living in common habitats are called allopatric species.
   (b) Two or more species living in common habitats are called sympatric species.
   (c) Species reproducing asexually are called agamo species.
   (d) Species which are morphologically similar but are found in different yet adjacent habitats are called Sibling species.

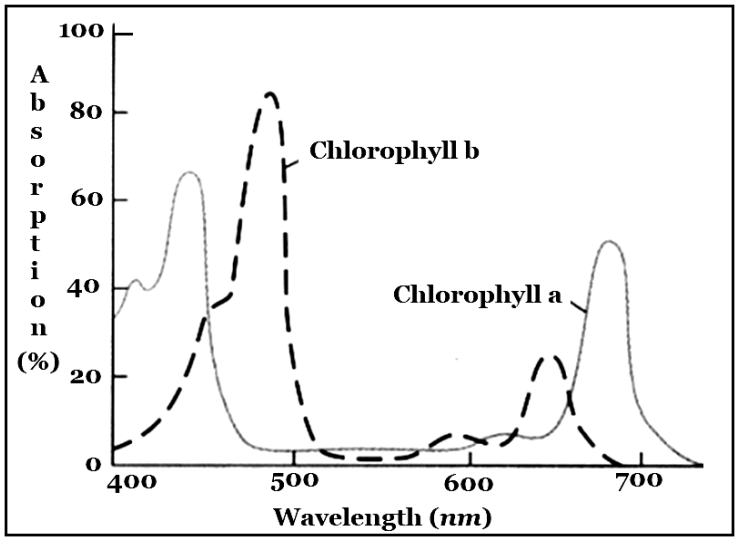
5. Which of the following is considered a secondary pollutant in the atmosphere?
   (a) Nitrogen oxides (NOx) (b) Carbon monoxide (CO)
   (c) Ozone (O_3) (d) Particulate matter (PM2.5)

6. While studying the characteristics of various animals, the character of 'SKELETON', whether external or internal, is started being described with which of the following groups?
   (a) Vertebrata (b) Arthropoda (c) Mollusca (d) Protozoa

7. Given below are two statements, one labeled as **Assertion A** and other labeled as **Reason R**.
   Assertion (A): The hypothalamus helps regulate body temperature by acting on the autonomic nervous system and other mechanisms like sweating or shivering.
   Reason (R): The hypothalamus plays a key role in regulating the release of hormones from the pituitary gland, which controls various functions like growth, reproduction and metabolism.
   Select the correct answer from the codes given below:
   CODES:
   (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) R is true but A is false

8. Some bacteria glide and travel in swarms. Which of the following bacteria conform to these characteristics?
   (a) *Oscillatoria* (b) *Spirulina* (c) *Myxobacteria* (d) *Chlamydia*

9. The Chlorophyll molecules make use of visible radiations by absorbing wavelengths of light which are effective in photosynthesis. When a photon of light collides with chlorophyll molecules, it gets excited and when it comes back to ground state, the released energy is utilized in photosynthetic phosphorylation. Different wavelengths of light give different amount of light reaction products. Following are the absorption spectra of various wavelengths of visible light.



Which of the following lights will yield maximum photosynthesis?
(a) Red (b) Blue (c) White (d) Green

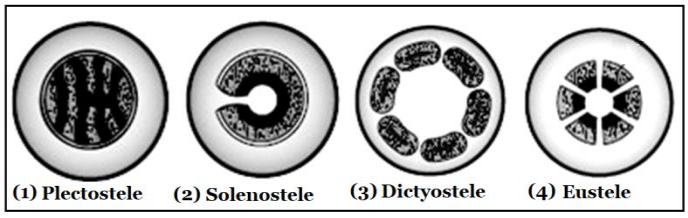
10. Match the items of Column I with the name of Genus mentioned in Column II:

COLUMN I	COLUMN II
1. Smallest fish	(i) *Microcebus*
2. Smallest Toad	(ii) *Mellisuga*
3. Smallest Reptile	(iii) *Paedocypris*
4. Smallest Bird	(iv) *Brachycephalus*
5. Smallest Primate	(v) *Brookesia*

Choose the correct option:
(a) 1- (v), 2- (iv), 3- (ii), 4- (i), 5- (iii) (b) 1- (iv), 2- (iii), 3- (v), 4- (i), 5- (ii)
(c) 1- (iii), 2- (iv), 3- (v), 4- (ii), 5- (i) (d) 1- (ii), 2- (i), 3- (iv), 4- (v), 5- (iii)

11. Based on one of the types of Mendel's hybridization experiments, F2 Phenotype number obtained was 8 whereas the genotype number was 27. Which kind of cross it was?
(a) Monohybrid cross (b) Tetrahybrid cross (c) Trihybrid cross (d) Dihybrid cross

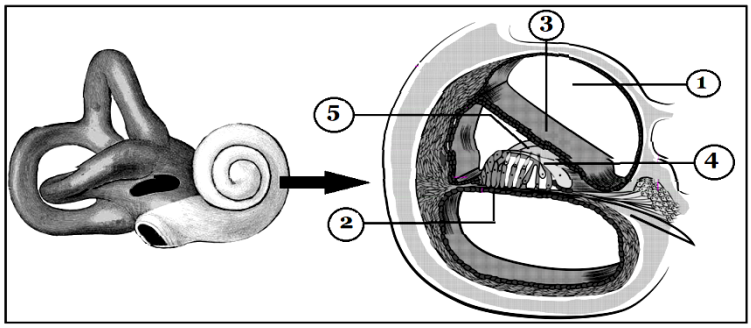
12. Vascular systems are normally regarded as first evolving in Pteridophytes. The central vascular cylinder of it is called as stele.



Which of the above steles evolved in Dicotyledons?
(a) (1) (b) (2) (c) (3) (d) (4)

13. To achieve an open defecation free India and improve solid waste management, when was Swachh Bharat Mission of Govt. of India launched?
(a) 15th August 2014 (b) 2nd October 2014
(c) 5th June 2014 (d) 26th January 2014

14. Study the diagram given below. Some anatomically observed parts of this important organ are labeled with numbers 1 to 5. Following structural or functional characters, numbered (i) to (v), are related to these parts:
    (i) Sensitive to a gradient of frequencies.
    (ii) A membrane called Vestibular or Reissner's membrane.
    (iii) The tips of the outer hair cells' stereocilia are embedded in it.
    (iv) This part starts at the oval window.
    (v) Supporting cells include Deiters' cells and pillar cells.



Choose the correct option showing the correct matching of 1 to 5 with (i) to (v):
(a) 1-(ii), 2-(i), 3- (iii), 4- (v), 5 (iv)
(b) 1-(iii), 2-(ii), 3- (i), 4- (iv), 5 (v)
(c) 1-(iv), 2-(i), 3- (ii), 4- (v), 5 (iii)
(d) 1-(v), 2-(iii), 3- (iv), 4- (i), 5 (ii)

15. Glyceraldehyde-3-phosphate is oxidized during Glycolysis. What happens to the 'H' atoms and the electrons (*e*) that are removed during oxidation?
    (a) They oxidize NAD^+
    (b) They are transferred to Pyruvic Acid
    (c) They reduce NAD^+
    (d) They are eliminated in the form of Methane

16. Both Jean Baptiste *de* Lamarck and Charles Darwin believed in the idea that particles come together from all parts of the body to form eggs and semen. This concept is popularly known as:
    (a) Spontaneous generation
    (b) Biogenesis
    (c) Pangenesis
    (d) Sexual Inheritance

17. The molecular formula of a commercial resin used for exchanging ions in water is $C_8H_7SO_3Na$. The maximum uptake of Ca^{2+} ions by the resin expressed in mol/g is
    (a) $\frac{2}{309}$ (b) $\frac{1}{412}$ (c) $\frac{1}{103}$ (d) $\frac{1}{206}$

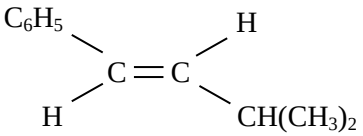
18. 3g of activated charcoal was added to 50 mL of 0.06N acetic acid in a flask. After 1 hr, it was filtered and the strength of filtrate was found to be 0.042 N. The amount of acetic acid adsorbed (per gram of charcoal) is
    (a) 42 mg (b) 54 mg (c) 18 mg (d) 36 mg

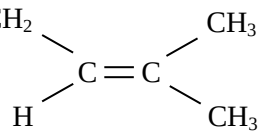
19. At 90 °C, for pure water, $[H_3O^+] = 10^{-6}$. The value of K_W for pure water at 90 °C is
    (a) 10^{-14} (b) 10^{-7} (c) 10^{-6} (d) 10^{-12}

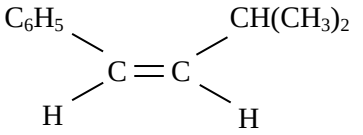
20. The bond dissociation energy of H_2 is 430.53 KJ mol^{-1}. If H_2 is exposed to radiation of wave length λ = 253.7 nm, the percent of radiant energy which will be converted into kinetic energy, is approximately
    (a) 22.8 % (b) 4.34 % (c) 10.5 % (d) 8.68 %

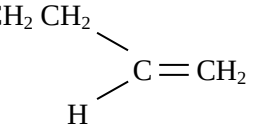
21. According to Bohr's atomic model, the approximate quantum number of a circular orbit of diameter 20.6 nm of hydrogen atom is
    (a) 10 (b) 14 (c) 12 (d) 16

22. Consider the reaction $C_6H_5CH_2CH(OH)CH(CH_3)_2 \xrightarrow{\text{cons } H_2SO_4} A$.
Predominating product A is

(a) 

(b) 

(c) 

(d) 

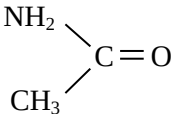
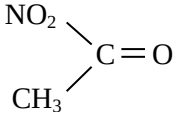
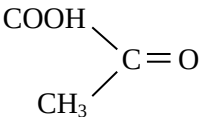
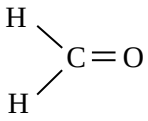
23. The correct order of increasing basic strength of conjugate bases given below is
(a) $RCOO^- < HC \equiv C^- < CH_3^- < NH_2^-$ (b) $CH_3^- < HC \equiv C^- < RCOO^- < NH_2^-$
(c) $RCOO^- < NH_2^- < HC \equiv C^- < CH_3^-$ (d) $RCOO^- < HC \equiv C^- < NH_2^- < CH_3^-$

24. Quaternary alkyl ammonium ion (R_4N^+) may behave as
(a) E^+ (b) Nu^- (c) both (d) neither E^+ nor Nu^-

25. p-alcohols can be prepared by hydrolysis of monohaloalkanes. Among the reactions mentioned below, which reactant will give least yield of p alcohol?
$R - X \xrightarrow{OH^-} ROH + X^-$

(a) $CH_3CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}H - CH_2I$ (b) CH_3CH_2I

(c) $CH_3CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}H - I$ (d) $(CH_3CH_2)_3C - I$

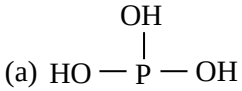
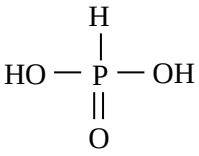
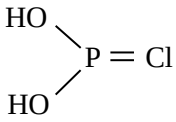
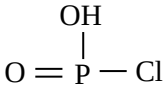
26. Carbonyl compounds ($\rangle C = O$) react with Grignard reagent followed by hydrolysis to produce alcohols. Select the carbonyl compounds which will yield alcohol in this reaction.
(a)  (b)  (c)  (d) 

27. Which of the following carboxylic acid is supposed to have highest value of K_a?
(a) $CH_2 = CH - CH_2COOH$ (b) $H \equiv C - CH_2 - COOH$
(c) $CH_3CH_2CH_2COOH$ (d) $HC \equiv C - COOH$

28. For Cl-atom, IE_1 and ΔH_{EG_1} values are 13.0 eV and 3.60 eV respectively. If Avogadro number of atoms are converted into Cl^- as $Cl + e^- \longrightarrow Cl^-$ and the energy released is completely used to ionise Cl-atom as $Cl \rightarrow Cl^+ + e^-$, then number of Cl-atom converted into Cl^+ are
(a) 1.667×10^{23} (b) 6.023×10^{23} (c) 3.2×10^{23} (d) can't be calculated

29. Which of the following property does not exhibit periodic behaviour in periodic table?
(a) bonding pattern (b) Electron gain enthalpy
(c) reactivity (d) Neutron/proton ratio

30. Consider the following reaction $PCl_3 \xrightarrow{HOH} A$. Preferred structure of A is

(a) 
(b) 
(c) 
(d) 

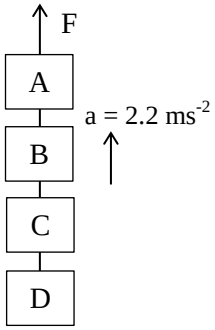
31. Amongst the given oxides, most basic and least basic oxides respectively are
MgO, SrO, K_2O, NiO, Cs_2O
(a) K_2O, SrO (b) Cs_2O, NiO (c) MgO, NiO (d) Cs_2O, SrO

32. Which of the following minerals are least abundant in nature?
(a) oxides (b) sulphates (c) carbonates (d) nitrates

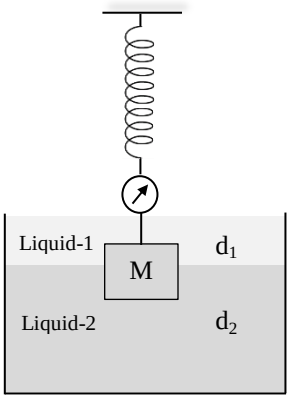
33. Loudness of sound on decibel scale during normal conversation between two persons is of the order of
(a) 6 dB (b) 12 dB (c) 60 dB (d) 120 dB

34. On a particular day, following electrical appliances were used as per details given below.
A 500 W washing machine for 45 minute
A 1200 W toaster for 30 minute
A 4200 W electric clothes dryer for 20 minute
Six 50 W bulbs for 4 hour
The total cost of electricity consumption at the rate of Rs. 12 per kilowatt hour (kWh) will be (in Rs)
(a) 45.06 (b) 42.90 (c) 38.60 (d) 36.20

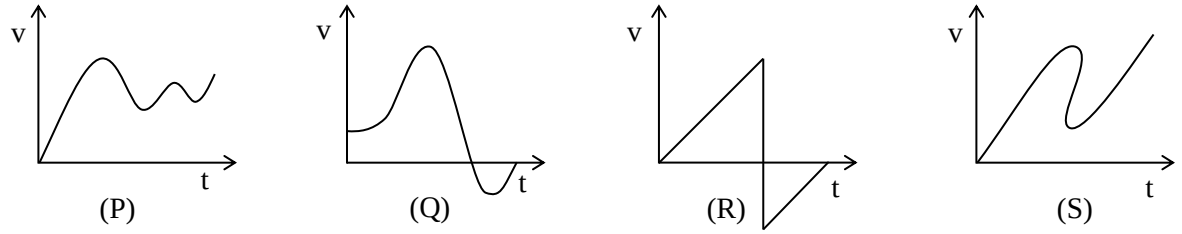
35. Four Identical blocks A, B, C and D, each of mass M = 1.0 kg are connected to one another through massless inextensible strings. The system is lifted vertically upward by applying force F which produces constant acceleration 2.2 m/s². The situation is shown in adjacent figure. Tension in the string connecting block A and B is
(a) 6.6 N
(b) 12 N
(c) 16.4 N
(d) 36 N



36. A cylindrical vessel contains two immiscible liquids: liquid-1 (density $d_1 = 1000$ kg/m³) over liquid-2 (density $d_2 = 3000$ kg/m³). A cubical block of mass M = 10 kg and density d = 8000 kg/m^3 is suspended from a spring balance and dipped into vessel at a position so that one-fourth of its volume immersed in liquid-1 and rest of the volume in liquid-2, as shown in figure. Density of air is negligible. The reading of spring balance in kg-wt must be
(a) 6.578
(b) 6.587
(c) 6.785
(d) 6.875

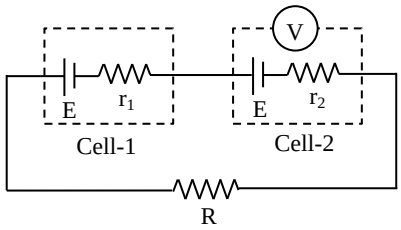


37. Following figures represent few velocity (v) verses time (t) graphs. Choose the graph showing realistic situation



(a) P only (b) P and Q (c) P, Q and R (d) P, Q R and S

38. Two cells having same emf E but different internal resistances r_1 and r_2, are connected in series with an external resistor R. An ideal voltmeter V records terminal potential difference of cell-2. The situation is shown in adjacent figure. The value of R for which voltmeter reads zero volt, is:



(a) $R = r_2 + r_1$ (b) $R = r_2 - r_1$ (c) $R = \frac{r_2 + r_1}{2}$ (d) $R = \sqrt{r_2 r_1}$

39. An engine, moving on straight rails with constant speed 90 km/hr, approaches a hill. When it is at a distance x from hill, it blows a whistle whose echo is heared by the driver after 4 second. If the speed of sound in air is 330 m/s, the value of x is

(a) 900 m (b) 750 m (c) 730 m (d) 710 m

40. Choose the incorrect statement:

(a) Light travels faster in air than in water

(b) Value of refractive index for a given pair of medium depends upon speed of light in two media

(c) When a light ray travelling in water enters obliquely into glass, it bends towards the normal

(d) An optical denser medium always possess greater mass density

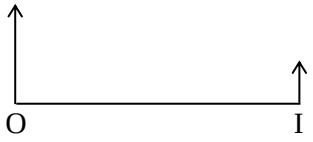
41. The adjacent figure shows positions of an object O and its image formed by a mirror. This is possible if

(a) a concave mirror is placed between O and I

(b) a concave mirror is placed to the right of I

(c) a convex mirror is placed between O and I

(d) a convex mirror is placed to the right of I



42. Read the following Statements S_1 and S_2

S_1: When a rectangular coil of copper wire is rotated in a uniform magnetic field, the direction of induced current changes once after each half revolution

S_2: An electric motor converts electrical energy into mechanical energy.

Now choose the correct option.

(a) S_1 is true, S_2 is false (b) S_1 is false, S_2 is true

(c) Both S_1 and S_2 are true (d) Both S_1 and S_2 are false

43. Three identical uniform solid spheres A, B and C, each having mass M and radius R are kept in such a way that centres of spheres A, B and C lie on same straight line and sphere B touches the other two spheres. If G is universal gravitational constant, the magnitude of resultant gravitational force on the sphere A due to sphere B and C is

(a) $\frac{3GM^2}{4R^2}$ (b) $\frac{3GM^2}{16R^2}$ (c) $\frac{5GM^2}{4R^2}$ (d) $\frac{5GM^2}{16R^2}$

44. A person with long-sightedness (hypermetropia) cannot see objects clearly at a distance less than 100 cm. The power of lens needed to read an object at normal near point (25 cm) is

(a) + 1 D (b) – 1 D (c) + 3 D (d) – 3 D

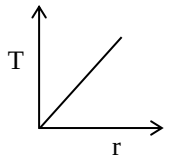
45. A current through a horizontal power line flows in south to north direction. The direction of magnetic field produced by power line at a point directly below the line is towards

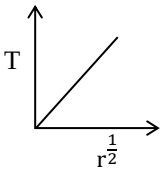
(a) Eastward (b) Westward (c) Upward (d) Downward

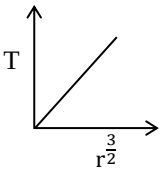
46. Linear momentum of a car moving on a road increases by 20 percent by changing its speed only. In this situation, kinetic energy of car increases by

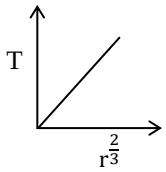
(a) 20% (b) 40% (c) 36% (d) 44%

47. For different planets moving around the Sun, if r represents mean distance of a planet from the Sun and T is its orbital period, which of the following graph represents motion of planets according to Kepler's laws.

(a) 

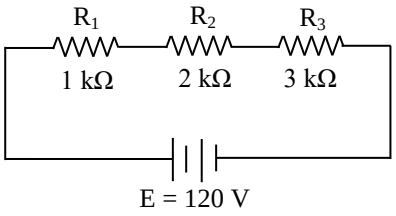
(b) 

(c) 

(d) 

48. A student has to design a circuit using a d.c. source of emf E = 120V in series with three resistors R_1 = 1 kΩ, R_2 = 2 kΩ, R_3 = 3 kΩ. Resistors are available with wattage ratings of 0.5W, 1W, 2W and 5W. Higher is the wattage rating, higher is the cost of resistor. To keep the cost of resistors minimum, wattage ratings used for each resistor are:

	R_1	R_2	R_3
(a)	0.5 W	0.5 W	0.5 W
(b)	0.5 W	1 W	1 W
(c)	0.5 W	1 W	2 W
(d)	1 W	2 W	2 W



A – 2

ANY NUMBER OF OPTIONS 4, 3, 2 or 1 MAY BE CORRECT

MARKS WILL BE AWARDED ONLY IF ALL THE CORRECT OPTIONS ARE BUBBLED AND NO INCORRECT.

49. Choose the appropriate answers related with components of reproductive organs in mammals:
(a) Corpus Allatum (b) Corpus Albicans (c) Corpus Cardiacum (d) Corpus Luteum

50. Find out the correct pair(s):
(a) Parathormone - Metamorphosis (b) Thyroxine-Calorigenic action
(c) Adenohypophysis-Intermedin (d) Adrenal Cortex - Fight and Flight Reaction

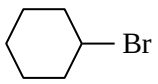
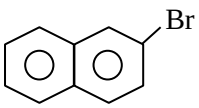
51. Which of the following plant pairs resemble in their inflorescence and fruit types?
(a) Coriander (*Coriandrum sativum*) and Fennel (*Foeniculum vulgare*)
(b) Coconut (*Cocos nucifera*) and Mango (*Mangifera indica*)
(c) Marigold (*Tagetes patula*) and Parthenium (*Parthenium hysterophorus*)
(d) Apple (*Malus sylvestris*) and Pear (*Pyrus communis*)

52. Which of the following statements is/are true regarding the differences between Algae and Fungi?
(a) Parenchyma cells in Algae and Pseudoparenchyma in Fungi
(b) Algal cell wall of Cellulose and Fungal cell wall of Chitin and β-1, 3 glucan
(c) Algae produce sporangia and sporangiospores while Fungi do not produce them
(d)Algae have autotrophic nutrition while Fungi are heterotrophic

53. Which of the following species has/have five unpaired electrons?
(a) V^{3+} (b) Cr^{3+} (c) Mn^{2+} (d) Fe^{3+}

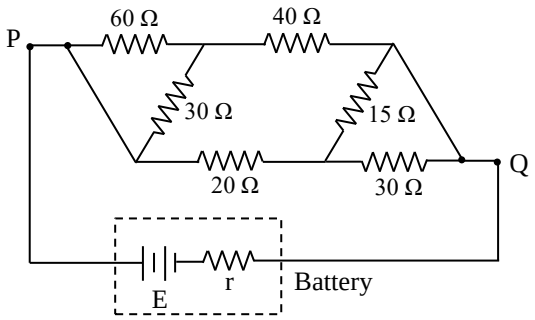
54. Assuming complete dissociation, select the solution having pH = 13.
(a) 2g NaOH/500 mL solution (b) 0.05 M/100 mL $Ca(OH)_2$ solution
(c) 0.1 N/100 mL $Ca(OH)_2$ solution (d) 1 g NaOH/1000 mL solution

55. Which of the following reaction(s) will generate an electrophile?
(a) $C_2H_5Cl \xrightarrow{AlCl_3}$
(b) $C_6H_5CH_2Br \xrightarrow{CuBr_2}$
(c) $C_6H_5COOH \xrightarrow{H_3O^+}$
(d) Fuming HNO_3 + conc. $H_2SO_4 \longrightarrow$

56. Which of the following compounds can't be used to synthesize Grignard reagent?
(a) $CH_3\underset{\displaystyle NH_2}{\underset{|}{CH}} - CH_2\,CH_2Br$
(b) 
(c) 
(d) $BrCH_2 - \overset{\displaystyle O}{\overset{\|}{C}} - OH$

57. A ray of light travelling in a uniform transparent medium is incident on plane interface separating the medium from air at angle of incidence 47°. The ray undergoes total internal reflection. Which of the following can be the possible value of refractive index of the medium? [Given Cos 43° = 0.73]
(a) 1.33 (b) 1.42 (c) 1.5 (d) 1.6

58. In the following figure, a battery of emf E = 90 V and internal resistance r = 10 Ω is supplying current to a resistor network connected between points P and Q.



Choose the Correct option(s)

(a) Potential difference between points P and Q is 60 volt.

(b) Current passing through 15 Ω resistor is $\frac{4}{3}$ amp

(c) Electric current passing through 60 Ω resistor is $\frac{2}{3}$ amp

(d) Electric power delivered from battery to resistor network between point P and Q is 180 Watt

59. A uniform copper wire of mass 2.23×10^{-3} kg carries 1.0 A current when potential difference across the wire is 1.7 volt. If the density of copper is 8.92×10^{3} kg/m³ and its resistivity is 1.7×10^{-8} ohm-meter. Choose the Correct option(s)

(a) Length of wire, L = 5 meter

(b) Area of cross section of wire, $A = 5 \times 10^{-6}$ m²

(c) Electric power dissipated in wire = 1.7 watt

(d) Resistance of wire is 1.7 ohm

60. At the instant the traffic signal turns green, a car starts moving with constant acceleration 2 m/s². At the same instant, a truck travelling in the same direction with constant speed 72 km/hr overtakes and passes the Car. Assume that both Car and truck continue to travel in straight line in different lanes of the road. Now choose the correct option(s)

(a) Car will overtake the truck after 20 sec of start of its motion

(b) Car will overtake the truck after travelling through distance 400 meter from starting point

(c) Speed of Car when it overtakes the truck will be twice of speed of truck

(d) The distance-time graph for the motion of Car will be a straight line

Rough Work