Test Paper : **III**

Test Subject : **PHYSICAL SCIENCE**

Test Subject Code : **K-2513**

Test Booklet Serial No. : _____

OMR Sheet No. : _____

Roll No. | | | | | | | | |

(Figures as per admission card)

Name & Signature of Invigilator/s

Signature : _____ Signature : _____

Name : _____ Name : _____

Paper : III

Subject : PHYSICAL SCIENCE

Time : 2 Hours 30 Minutes Maximum Marks : 150

Number of Pages in this Booklet : **16** Number of Questions in this Booklet : **75**

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ಈ ಪುಟದ ಮೇಲ್ತುದಿಯಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
2. ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ಎಪ್ಪತ್ತೈದು ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
3. ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ, ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆಯನ್ನು ನಿಮಗೆನೀಡಲಾಗುವುದು. ಮೊದಲ5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಿಕೆಯನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರೀಕ್ಷಿಸಲು ಕೋರಲಾಗಿದೆ.
   (i) ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆಗೆ ಪ್ರವೇಶಾವಕಾಶ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ಟಿಕ್ಕರ್ ಸೀಲ್ ಇಲ್ಲದ ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆ ಸ್ವೀಕರಿಸಬೇಡಿ. ತೆರೆದ ಪುಸ್ತಿಕೆಯನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.
   (ii) **ಪುಸ್ತಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳೆ ನೋಡಿರಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ, ಅಥವಾ ದ್ವಿಪ್ರತಿ ಅಥವಾ ಅನುಕ್ರಮವಾಗಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಿಕೆಯನ್ನು ಕೂಡಲೆ5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವೀಕ್ಷಕರಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಿಕೆಗೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ, ಯಾವುದೇ ಹೆಚ್ಚು ಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.**
4. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೂ (A), (B), (C) ಮತ್ತು (D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕಪ್ಪಾಗಿಸಬೇಕು.
   ಉದಾಹರಣೆ: (A) (B) ● (D)
   (C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
5. ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಗಳನ್ನು, **ಪತ್ರಿಕೆIII ಪುಸ್ತಿಕೆಯೊಳಗೆ ಕೊಟ್ಟಿರುವ** OMR **ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾತ್ರವೇ ಸೂಚಿಸತಕ್ಕದ್ದು.** OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿನ ಅಂಡಾಕೃತಿ ಹೊರತುಪಡಿಸಿ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
6. OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿರಿ.
7. ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಿಕೆಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
8. ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು, ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗಿರುತ್ತೀರಿ.
9. ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವೀಕ್ಷಕರಿಗೆ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMR ನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯ ಕೂಡದು.
10. ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
11. **ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿರಿ.**
12. **ಕ್ಯಾಲ್ಕುಲೇಟರ್ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯ ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.**
13. **ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of seventy five multiple-choice type of questions.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
   (ii) **Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.**
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.
   Example : (A) (B) ● (D)
   where (C) is the correct response.
5. Your responses to the question of Paper III are to be indicated in the **OMR Sheet kept inside the Booklet**. If you mark at any place other than in the ovals in OMR Answer Sheet, it will not be evaluated.
6. Read the instructions given in OMR carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. You have to return the test OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must NOT carry it with you outside the Examination Hall.
10. You can take away question booklet and carbon copy of OMR Answer Sheet soon after the examination.
11. **Use only Blue/Black Ball point pen.**
12. **Use of any calculator or log table etc., is prohibited.**
13. **There is no negative marks for incorrect answers.**

PHYSICAL SCIENCE
Paper – III

Note : This paper contains **seventy-five (75)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. If A^{μ} and $B\gamma$ are components of contravariant and covariant vectors, what is the nature of the quantity $A^{\mu} B_r$?

(A) Zero

(B) An invariant

(C) A contravariant tensor

(D) A mixed tensor of rank 2

2. For the Ricci tensor, $R_{\mu r}$ what is the quantity $g_{\mu r}$ in the summation convention ?

(A) A vector

(B) Scalar

(C) A pseudoscalar

(D) Scalar curvature

3. The value of $\int_0^1 \frac{dx}{1+x}$ by Simpon's rule is

(A) 0.96315

(B) 0.63915

(C) 0.69315

(D) 0.69351

4. The order of error in the Simpson's rule for numerical integration with a step size h is

(A) h

(B) h^2

(C) h^3

(D) h^4

5. G is a finite group of order n, $a \in G$ and order of a is m, if G is cyclic then

(A) $m = n = 0$

(B) $m = n$

(C) $m > n$

(D) $m < n$

6. The set of all non-singular square matrices of same order with respect to matrix multiplication is

(A) Quasi-group

(B) Monoid

(C) Group

(D) Abelian group

7. **Statement (A)** : All cyclic groups are abelian.

   Statement (B) : The order of cyclic group is same as the order of its generator.

   (A) (A) and (B) are false

   (B) (A) is true, (B) is false

   (C) (B) is true, (A) is false

   (D) (A) and (B) are true

8. **Statement (A)** : Every isomorphic image of a cyclic group is cyclic.

   Statement (B) : Every homomorphic image of a cyclic group is cyclic.

   (A) Both (A) and (B) are true

   (B) Both (A) and (B) are false

   (C) Only (A) is true

   (D) Only (B) is true

9. A one to one mapping of a finite group onto itself is

   (A) Isomorphism

   (B) Homomorphism

   (C) Automorphism

   (D) Monomorphism

10. For a changed particle in an electromagnetic field, the canonical momenta are

    (A) $mv + qA/C$

    (B) $\frac{1}{2mv^2} + \frac{qA}{C}$

    (C) $mv - qA/C$

    (D) $\frac{1}{2mv^2} - \frac{qA}{C}$

11. A linear transformation of a generalized co-ordinate q and the corresponding momentum p to Q and P is given by $Q = q + p$; $q + \alpha p$ is canonical if the value of the constant α is

    (A) –1

    (B) 0

    (C) +1

    (D) +2

12. The value of the Poisson bracket $\left[\bar{a} \cdot \bar{r}, \bar{b} \cdot \bar{p}\right]$ where $\bar{a}$ and $\bar{b}$ are constant vectors, is

    (A) ab

    (B) a – b

    (C) a + b

    (D) $a \cdot b$

13. The canonical transformation corresponding to the generating function $F = \sum_i q_i p_i$

(A) Identify transformation
(B) Reflection transformation
(C) Exchange transformation
(D) Reflection exchange transformation

14. Which one of the following is not the generating function of the canonical transformation $P = \frac{1}{Q}$ and $q = PQ^2$

(A) q/Q
(B) $2\sqrt{qP}$
(C) P/P
(D) Q/P

15. Which of the following statements is false ?
(A) The Poisson bracket of momentum conjugate to a cyclic co-ordinate with Hamiltonian vanishes
(B) Lagrangian bracket is invariant under canonical transformations
(C) Poisson bracket changes sign under commutation of concerned dynamical variables
(D) Lagrangian bracket is commutative with respect to concerned dynamical variables

16. If (X, H) = 0 and (Y, H) = 0, the value of (H (X, Y)) is

(A) 0
(B) 1
(C) –1
(D) 2

17. The value of $\frac{d}{dt}(q_i p_j)$ is

(A) Always zero
(B) Always one
(C) Zero when $i \neq j$
(D) Zero when i = j

18. If the Hamiltonian of a system is $H = \left(p^2/2m\right) + V(q)$, the value of (p, (p, H)) is

(A) Zero
(B) One
(C) $\frac{\partial^2 v}{\partial q^2}$
(D) $\frac{\partial v}{\partial q}$

19. If H is constant of motion, the value of ((p, H), H) is

(A) p

(B) $\dot{p}$

(C) $\ddot{p}$

(D) $-\ddot{p}$

20. The plasma angular frequency fc if an ionized gas with ion concentration, N is

(A) $9\sqrt{N}$

(B) $\frac{\sqrt{N}}{9}$

(C) 3N

(D) $N/3$

21. The Lorentz condition satisfied by ϕ and $\vec{A}$ is

(A) $\text{div}\overline{A} + \frac{1}{C^2}\frac{d\phi}{dt} = 0$

(B) $\text{div}\overline{A} - \frac{1}{C^2}\frac{d\phi}{dt} = 0$

(C) $\nabla^2\overline{A} + \frac{1}{C^2}\frac{d\phi}{dt} = 0$

(D) $\nabla^2\overline{A} - \frac{1}{C^2}\frac{d\phi}{dt} = 0$

22. A moving charge can radiate electromagnetic energy if it

(A) Travels with uniform speed

(B) Is accelerated

(C) Is at rest

(D) Is kept in a magnetic field

23. As oscillating electric dipole is equivalent to

(A) An accelerated charge

(B) Static charge

(C) An electrically neutral system

(D) A dielectric

24. A retarded potential represents the

(A) Present value of the potentials due to past position of the charge

(B) Past value of potentials due to present position of the charge

(C) Present value of potentials due to present position of the charge

(D) Past value of the potentials due to past position of the charge

25. A TEM wave is incident obliquely on a dielectric boundary with $\in_{r1} = 2$ and $\in_{r2} = 1$. The angle of incidence for total internal reflection is

(A) 60°

(B) 30°

(C) 45°

(D) 90°

26. The capacitance per unit length and the characteristic impedance of a loss less transmission line are C and Z_0, respectively. The velocity of travelling wave on the transmission line is

(A) $Z_0 C$

(B) Z_0 / C

(C) $\frac{1}{Z_0 C}$

(D) $\frac{C}{Z_0}$

27. The dominant mode in a rectangular wave guide is TE_0 because this mode has

(A) No attenuation

(B) No cutoff

(C) No magnetic field component

(D) The highest cutoff wavelength

28. Waveguides are used mostly for microwave signals because

(A) They depend on rectilinear propagation which applies to microwaves only

(B) Losses are too heavy at other frequencies

(C) They are not excited at lower frequencies

(D) They would be too bulky at lower frequencies

29. The cutoff wavelength for TE_{20} mode for a standard rectangular waveguide is

(A) $2/a$

(B) 2a

(C) a

(D) $2a^2$

30. During scattering of a particle by a spherically symmetric potential, the conserved quantities are

(A) E only

(B) L^2 only

(C) E, L_z and L^2

(D) L_z only

31. Scattering is always accompanied by

(A) Phase shift

(B) Reaction

(C) Absorption

(D) New particle creation

32. The optical theorem is mathematically stated as

(A) $\sigma = \frac{4\pi}{k} \mathrm{Re}\, f(0)$

(B) $\sigma = \frac{4\pi}{k} \mathrm{Im}\, f(0)$

(C) $\sigma = \frac{k}{4\pi} \mathrm{Im}\, f(0)$

(D) $\sigma = \frac{k}{4\pi} \mathrm{Re}\, f(0)$

33. Born approximation is applicable for scattering by

(A) Low Z targets at high energy

(B) Low Z targets at low energy

(C) High Z targets at high energy

(D) High Z targets at low energy

34. The dancing motion of a Dirac electron is called

(A) Bremsstrahlung

(B) Zwitterbewegung

(C) Helicity

(D) Oscillation

35. The Dirac matrices are

(A) Zero trace unit square (4×4) matrices

(B) Unit trace zero square (4×4) matrices

(C) Zero trace unit square (2×2) matrices

(D) Unit trace zero square (2×2) matrices

36. The vectors of dual space are called

(A) Ket vectors

(B) Bra vectors

(C) Dirac vectors

(D) Poisson vectors

37. A bra and a ket vector an orthogonal if

(A) Their vector product is zero

(B) Their scalar product is zero

(C) Their scalar sum is zero

(D) All the above are valid

38. The Klein-Gordon equation generates a

(A) Non-negative probability density

(B) Negative probability density

(C) No probability density

(D) Only positive probability density

39. The notion of antiparticles is based on the solutions of

(A) Klein-Gordon equation

(B) Dirac equation

(C) Schwinger equation

(D) Schrodinger equation

40. A second order phase transition is characterized by

(A) A latent heat

(B) A change in volume

(C) A discontinuous change in its specific heat

(D) Irreversible behaviour during warming and cooling

41. In the process of phase transition

(A) Gibb's function remains constant

(B) Only entropy remains constant

(C) Only volume remains constant

(D) Only temperature remains constant

42. Which of the following is an example of a first order phase transition ?

(A) A liquid-gas phase transition at the critical point

(B) A liquid-gas phase transition away from the critical point

(C) A normal metal-super conductor transition

(D) Normal liquid Helium to super fluid helium transition

43. The transition of He-4 from the normal liquid state to a superfluid state is known as

(A) Beta transition

(B) Lamda transition

(C) Bose-Einstein condensation

(D) Zeeman effect

44. The phenomenon of diffusion occurs in

(A) Gases only

(B) Liquids only

(C) Solids only

(D) Solids, liquids and gases

45. The temperature transducers exhibit non-linear behaviour. The order in which they exhibit non-linearity (highest to lowest) is

(A) Thermocouple, RTDs, thermistors

(B) Thermistor, thermocouples, RTDs

(C) RTDs, thermocouples, thermistor

(D) Thermistor, RTDs, thermocouples

46. A certain Op-Amp has an open loop gain of 10^5. If the feedback factor is 0.1, the closed loop gain is around

(A) 10000

(B) 10

(C) 1000

(D) 100

47. Which of the following devices is used for the measurement of low pressure below atmospheric pressure ?

(A) Ionization gauge

(B) Strain gauge

(C) Compound gauge

(D) Pirani gauge

48. The gauge factor is defined as

(A) $\frac{\Delta L/L}{\Delta R/R}$

(B) $\frac{\Delta R/R}{\Delta L/L}$

(C) $\frac{\Delta R/R}{\Delta D/D}$

(D) $\frac{\Delta R/R}{\Delta \rho/\rho}$

49. A linear displacement transducer (digital) normally uses

(A) Straight-Binary code

(B) BCD

(C) Gray code

(D) Hexadecimal code

50. The GM counter is

(A) Energy selective

(B) Non-energy selective

(C) A scintillation detector

(D) Semiconductor detector

51. A random noise generator produces a signal

(A) Whose amplitude varies randomly

(B) Which has no periodic frequency

(C) Has an unpredictable power spectrum

(D) All of the above

52. If $P < 0.05$, the level of significance is

(A) 5%

(B) 50%

(C) 0.05%

(D) 0.5%

53. The mean and variance of a χ^2 distribution with 8 degrees of freedom are

(A) 8, 16

(B) 8, 12

(C) 4, 8

(D) 16, 32

54. A hydrogen atom is in p-state. For this values of j are

(A) $5/2, 3/2, 1/2$

(B) $-1/2, +1/2, 3/2$

(C) $3/2, 1/2$

(D) $-1/2, -3/2$

55. Which of the photo-electric transducers is used for production of electric energy by converting solar energy ?

(A) Photo emissive cell

(B) Photo-diode

(C) Photo resistive cell

(D) Photo-conductive cell

56. $\psi_{k+g}(r) = \psi_k(r)$; $E_{k+g} = E_k$ describes

(A) The periodic nature of Block functions and their eigen values in a reciprocal lattice, respectively

(B) The periodic nature of Block functions and their eigen values in a direct lattice, respectively

(C) The orthogonality nature of Block functions and their eigen values

(D) The ortho-normality nature of Block functions and their eigen values

57. In the BCS theory of super conductivity the super conducting state formed from pairs of electrons act as

(A) Bosons (B) Fermions

(C) Protons (D) Electrons

58. The value of 'flux on' in a superconductor in SI unit is

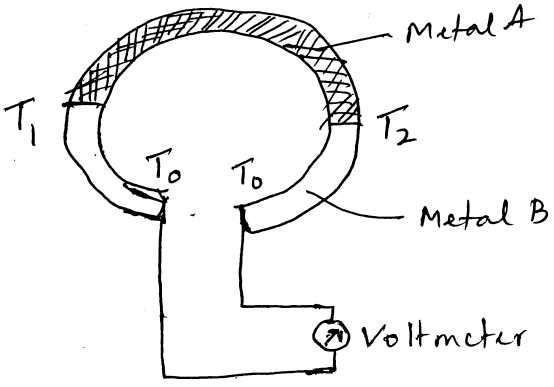
(A) 2.0678×10^{-18} Tesla m^{-2}

(B) 2.0678×10^{-7} gauss cm^{-2}

(C) 2.0678×10^{-15} Tesla m^{2}

(D) 2.0678×10^{-15} Tesla m^{-2}

59. The schematic arrangement shown in figure is for measuring one of the followings :



(Temperature $T_1 \neq T_2 \neq T_0$]

(A) Joule effect

(B) Peltier effect

(C) Thomson effect

(D) Seebeck effect

60. Superfluidity is a state of matter in which the matter behaves like a fluid with

(A) Infinite viscosity

(B) Zero viscosity

(C) High viscosity

(D) Low viscosity

61. According to Lorentz model, the Hall Coefficient (R_H) of metals is given by

(A) $R_H = -\left(\frac{3\pi}{8}\right)\frac{1}{ne}$

(B) $R_H = -\frac{1}{ne}$

(C) $R_H = \frac{1}{ne}$

(D) $R_H = \left(\frac{3\pi}{8}\right)\frac{1}{ne}$

62. The frequency of the AC current produced when a DC voltage of 15 μV is applied across the Josephson junction is

(A) 16.2 MHz

(B) 2.41 GHz

(C) 2.41 KHz

(D) 2.41 THz

63. The nearest neighbor distance (2r) in a body centred cube (bcc) is

(A) $\frac{a\sqrt{3}}{4}$

(B) a

(C) $\frac{a\sqrt{3}}{2}$

(D) $\frac{a}{\sqrt{2}}$

64. A free electron is placed in a magnetic field of strength 1.0 Tesla. The resonance frequency [g = 2.0023 and $\mu_B = 9.274 \times 10^{-24}\ JT^{-1}$] is

(A) 28.02 GHz

(B) 2.802 GHz

(C) 28.02 MHz

(D) 28.02 KHz

65. A nucleus has a mass number 216. Its radius is

(A) 0.78 fermi

(B) 0.078 fermi

(C) 78 fermi

(D) 7.8 fermi

66. According to liquid drop model, the surface correction term is proportional to

(A) A

(B) $A^{1/3}$

(C) $A^{2/3}$

(D) $A^{-2/3}$

67. Parity is violated during

(A) Strong interaction

(B) Weak interaction

(C) Electromagnetic interaction

(D) Gravitational interaction

68. The binding energy of two nuclei ${}^{n}P$ and ${}^{2n}Q$ are x Joule and y Joule, respectively. If 2x > y, then the energy released in the reaction ${}^{n}P + {}^{m}P = {}^{2n}Q$ is

(A) xy

(B) 2x + y

(C) 2x – y

(D) x + y

69. Beta decay involves the interaction of

(A) Leptons with baryonic field

(B) Baryons with the leptonic field

(C) Baryons with the electromagnetic field

(D) Photons with the baryonic field

70. The nucleons prefer to spend most of their time

(A) Inside the deuteron boundary

(B) At the origin of the deuteron boundary

(C) At the surface of the deuteron

(D) Outside the deuteron boundary

71. The ground state spin of even-even nuclei is

(A) Zero

(B) Half integral

(C) Negative only

(D) Positive only

72. According to the collective rotational model the spin-parity of the lowest energy state is

(A) 1^+

(B) 2^+

(C) 4^+

(D) 0^+

73. A nucleus undergoes beta decay from $0^+ \rightarrow 1^+$ state, the type of transition is

(A) Pure Fermi allowed

(B) Pure GT allowed

(C) Mixed

(D) Pseudo scalar

74. The quark composition of a proton and neutron, respectively is

(A) ddu and uud

(B) duu and ddu

(C) ddd and ddu

(D) uuu and duu

75. In a typical current-voltage characteristic measurement, the output of a Lock-in amplifier when the input signal is of frequence w, is

(A) D.C. part of the signal

(B) d^2I/dv^2

(C) dI/dv

(D) d^3I/dv^3

ಚಿತ್ತು ಬರಹಕ್ಕಾಗಿ ಸ್ಥಳ
Space for Rough Work

ಚಿತ್ತು ಬರಹಕ್ಕಾಗಿ ಸ್ಥಳ
Space for Rough Work

ಚಿತ್ತು ಬರಹಕ್ಕಾಗಿ ಸ್ಥಳ
Space for Rough Work