

Test Booklet No.

प्रश्नपत्रिका क्र.

F

Paper-II

PHYSICAL SCIENCE

Signature and Name of Invigilator

Seat No.

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1. (Signature)

(In figures as in Admit Card)

(Name)

Seat No.

(In words)

2. (Signature)

(Name)

OMR Sheet No.

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(To be filled by the Candidate)

AUG - 32215**Time Allowed : 1¼ Hours]****[Maximum Marks : 100****Number of Pages in this Booklet : 20****Number of Questions in this Booklet : 50****Instructions for the Candidates**

- Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
- This paper consists of **50** objective type questions. Each question will carry *two* marks. *All* questions of Paper-II will be compulsory, covering entire syllabus (including all electives, without options).
- At the commencement of examination, the question booklet will be given to the student. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as follows :
 - 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 or open booklet.
 - Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to missing pages/questions or questions repeated or not in serial order or any other discrepancy should not be accepted and correct booklet should be obtained from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given. The same may please be noted.**
 - After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
- Each question has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
Example : where (C) is the correct response.

A
B

D
- Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only**. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done at the end of this booklet.
- If you write your Name, Seat Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, you will render yourself liable to disqualification.
- You have to return original OMR Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry the Test Booklet and duplicate copy of OMR Sheet on conclusion of examination.
- Use only Blue/Black Ball point pen.**
- Use of any calculator or log table, etc., is prohibited.**
- There is no negative marking for incorrect answers.**

विद्यार्थ्यांसाठी महत्वाच्या सूचना

- परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
- सदर प्रश्नपत्रिकेत **50** बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे. सदरचे प्रश्न हे या विषयाच्या संपूर्ण अभ्यासक्रमावर आधारित आहेत.
- परीक्षा सुरू झाल्यावर विद्यार्थ्यांना प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात.
 - प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू नये.
 - पहिल्या पृष्ठावर नमूद केल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावी. पृष्ठे कमी असलेली/कमी प्रश्न असलेली/प्रश्नांचा चुकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटातच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळही वाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.
 - वरीलप्रमाणे सर्व पडताळून पहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर लिहावा.
- प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) अशी चार विकल्प उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळ/निळा करावा.
उदा. : जर (C) हे योग्य उत्तर असेल तर.

A
B

D
- या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे **ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत**. इतर ठिकाणी लिहीलेली उत्तरे तपासली जाणार नाहीत.
- आत दिलेल्या सूचना काळजीपूर्वक वाचाव्यात.
- प्रश्नपत्रिकेच्या शेवटी जोडलेल्या कोऱ्या पानावरच कच्चे काम करावे.
- जर आपण ओ.एम.आर. वर नमूद केलेल्या ठिकाणा व्यतिरिक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटले अशी कोणतीही खूण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमार्गांचा अवलंब केल्यास विद्यार्थ्यांना परीक्षेस अपात्र ठरविण्यात येईल.
- परीक्षा संपल्यानंतर विद्यार्थ्यांनी मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापी, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
- फक्त निळा किंवा काळा बॉल पेनचाच वापर करावा.**
- कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.**
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.**

AUG - 32215/II

Physical Science

Paper II

Time Allowed : 75 Minutes]

[Maximum Marks : 100

Note : This Paper contains **Fifty (50)** multiple choice questions. Each question carries **Two (2)** marks. Attempt *All* questions.

1. If \vec{a} is a constant vector, then

$$\vec{\nabla} \cdot \left(\vec{a} \times \vec{r} \right) \text{ is equal to :}$$

- (A) a
 (B) $2a$
 (C) 0
 (D) $a/2$

2. The volume of the parallelepiped with sides :

$$\vec{a} = \hat{i} + 2\hat{j} + 3\hat{k},$$

$$\vec{b} = 4\hat{i} + 5\hat{j} + 6\hat{k} \text{ and}$$

$$\vec{c} = 7\hat{i} + 8\hat{j} + 10\hat{k} \text{ is :}$$

- (A) $2 + \sqrt{3}$
 (B) $\sqrt{2}$
 (C) $\sqrt{3}$
 (D) 3

3. The constant term (a_0) in the Fourier series expansion of the function $f(x) = x^2$ for $-\pi < x < \pi$ is :

- (A) π^2
 (B) $\pi^2/3$
 (C) $\pi/2$
 (D) $\pi^3/3$

4. Fourier transform of unit step function :

$$\theta(x) = \begin{cases} 1 & x \geq 0 \\ 0 & x < 0 \end{cases}$$

is :

- (A) $\frac{1}{2\pi k}$
 (B) $\frac{1}{2\pi} k$
 (C) $\frac{1}{2\pi} \frac{1}{k^2}$
 (D) $\frac{1}{2\pi k} e^{-k}$

5. The residue of $\frac{z^2}{z^2 + a^2}$ at $z = ia$ is :

- (A) $ia/2$
- (B) ia
- (C) ia^2
- (D) $ia^2/2$

6. A deck of 5 cards (each carrying a distinct number from 1 to 5) is shuffled thoroughly. Two cards are then removed one at a time from the deck. What is the probability that the two cards are selected with the number on the first card being one higher than the number on the second card ?

- (A) $1/5$
- (B) $4/25$
- (C) $1/4$
- (D) $2/5$

7. $y(x)$ satisfies the differential equation :

$$\frac{d^2y}{dx^2} + y = \operatorname{cosec}(x)$$

The complementary function part y_c of $y(x)$ is given by :

- (A) $y_c(x) = c_1 \sin x + c_2 \cos x$
- (B) $y_c(x) = xe^{ix}$
- (C) $y_c(x) = (c_1 \sin x + c_2 \cos x) e^x$
- (D) $y_c(x) = c_1 e^x + c_2 \cos x$

8. A, B, C, D are $(n \times n)$ matrices, each with non-zero determinant. If :

$$ABCD = I,$$

then B^{-1} is :

- (A) $D^{-1}C^{-1}A^{-1}$
- (B) CDA
- (C) ADC
- (D) does not exist

9. The degrees of freedom for a particle falling under gravity (without air resistance) are :

- (A) Zero
- (B) One
- (C) Two
- (D) Three

10. A particle of mass m is released from height h . Its velocity at the position when it has covered a distance equal to $(h/2)$ is :

- (A) $v = \sqrt{\frac{2g}{h}}$
- (B) $v = \frac{2g}{h}$
- (C) $v = \sqrt{g.h}$
- (D) $v = g.h$

11. Which of the following properties of the Lagrangian is due to “space is isotropic” characteristic of the inertial frame of reference ?

- (A) Invariant to translation
- (B) Invariant to time
- (C) Invariant to rotation
- (D) Explicit function of time

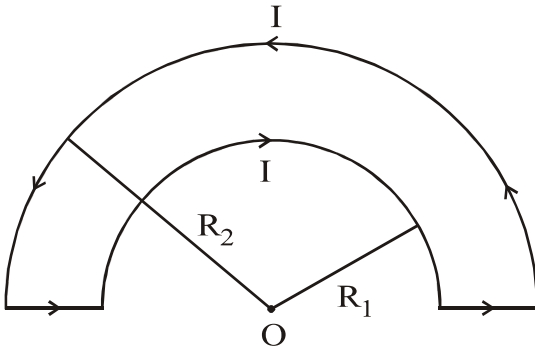
12. For a given system, Hamiltonian $H(q, p)$ is defined as :
 $H(q, p) = p + \sqrt{1 - p^2} \cdot \sin q \quad |p| \leq 1$.
 The Hamilton's equations of motion are :

- (A) $\dot{q} = 1 - \frac{p \sin q}{\sqrt{1 - p^2}},$
 $-\dot{p} = \sqrt{1 - p^2} \cos q$
- (B) $\dot{q} = 1 - \frac{p \cos q}{\sqrt{1 - p^2}},$
 $\dot{p} = \sqrt{1 - p^2} \cos q$
- (C) $\dot{q} = 1 - \frac{2p \cos q}{\sqrt{1 - p^2}},$
 $-\dot{p} = \sqrt{1 - p^2} \cos q$
- (D) $\dot{q} = 1 + \frac{p \sin q}{\sqrt{1 - p^2}},$
 $\dot{p} = \sqrt{1 - p^2} \cos q$

- | | |
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| <p>13. For a particle under the action of central force, which of the following quantities is invariant ?</p> <p>(A) Linear velocity</p> <p>(B) Angular velocity</p> <p>(C) Linear momentum</p> <p>(D) Angular momentum</p> <p>14. Which of the following statements holds true for a rigid rotator (or rotor) ?</p> <p>(A) All the three principal moments of inertia are different</p> <p>(B) All the three principal moments of inertia are equal</p> <p>(C) Two of the three principal moments of inertia are equal and the third one is non-zero and different</p> <p>(D) Two of the three principal moments of inertia are equal and the third one is zero</p> | <p>15. The plane of oscillation of Foucault pendulum rotates with infinite period, when it is located at (λ is the latitude of location) :</p> <p>(A) $\lambda = 90^\circ\text{N}$</p> <p>(B) $\lambda = 60^\circ\text{N}$</p> <p>(C) $\lambda = 30^\circ\text{N}$</p> <p>(D) $\lambda = 0^\circ$</p> <p>16. An observer is moving with relativistic speed u. His length measurements along the direction of velocity are half of the measurements made when he was at rest. His time measurement of 1 hr. when he was at rest, now becomes :</p> <p>(A) 30 minutes</p> <p>(B) 01 hour</p> <p>(C) 02 hours</p> <p>(D) Infinite hours</p> |
|--|--|

17. The magnetic induction \vec{B} at point

O in the figure is given as :



(A) $\frac{\mu_0 I}{4\pi} \left[\frac{1}{R_1} - \frac{1}{R_2} \right]$

(B) $\frac{\mu_0 I}{4\pi} R_1 R_2$

(C) $\frac{\mu_0 I}{4\pi} \left[\frac{1}{R_1} + \frac{1}{R_2} \right]$

(D) $\frac{\mu_0 I}{4\pi} (R_1 + R_2)$

18. A cubical box of sides 5 cm encloses 100 electric dipoles of unit moments. What would be the flux of electric field emanating from the cube ?

(A) $\frac{20}{\epsilon_0} \text{ V cm}$

(B) $\frac{100}{30 \epsilon_0} \text{ V cm}$

(C) Zero V cm

(D) $\frac{200}{\epsilon_0} \text{ V cm}$

19. A uniform current 20 A flows through a copper pipe of inner radius 10 cm. Which of the following statements is valid ?

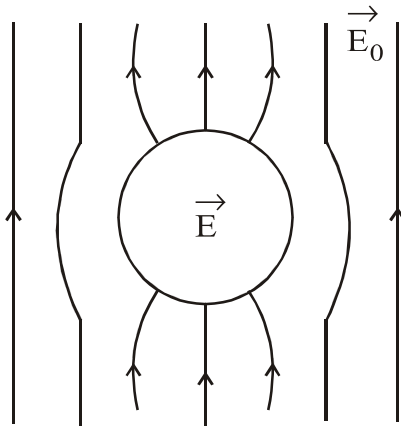
(A) The magnetic field is non-zero except along the axial points of the pipe.

(B) The magnetic field everywhere inside the pipe is zero.

(C) The magnetic field everywhere inside the pipe is constant and non-zero.

(D) The magnetic field is non-uniform inside the pipe.

20. An uncharged sphere of homogeneous linear dielectric material is placed in a uniform electric field \vec{E}_0 . The resultant electric field \vec{E} inside the dielectric sphere is :



- (A) Zero
- (B) Uniform non-zero and parallel to \vec{E}_0
- (C) Uniform non-zero and anti-parallel to \vec{E}_0
- (D) Non-uniform but along \vec{E}_0

21. In electrodynamics, the curling magnetic field is more appropriately expressed as :

- (A) a bound magnetization current density \vec{J}_M
- (B) a free current density \vec{J}
- (C) stationary electric charges
- (D) a free current density \vec{J} and a time-varying electric field \vec{D}

22. The continuity equation for charges and currents is not explicitly written in the Maxwell's equations. This is because :

- (A) It is not a universal law and holds good in certain cases only
- (B) It is difficult to prove the continuity equation rigorously
- (C) It is not required for time-varying electromagnetic fields
- (D) It is already included implicitly in the Maxwell's equations

23. If \vec{A} and V are the vector and scalar potentials, respectively, then the Lorentz gauge in time-varying electromagnetic case is given by :

(A) $\vec{\nabla} \times \vec{A} = \mu_0 \epsilon_0 \frac{\partial V}{\partial t}$

(B) $\vec{\nabla} \cdot \vec{A} = \mu_0 \epsilon_0 \frac{\partial V}{\partial t}$

(C) $\vec{\nabla} \cdot V = \mu_0 \epsilon_0 \frac{\partial \vec{A}}{\partial t}$

(D) $\vec{\nabla} \cdot \vec{A} = -\mu_0 \epsilon_0 \frac{\partial V}{\partial t}$

24. A plane polarized EM wave is propagating in certain medium such that the ratio of the electric energy density to the magnetic energy density is 0.01. Which of the following statements is valid for this medium ?

(A) Conduction current is about 100 times larger than the displacement current

(B) Conduction and displacement currents are of the same magnitude

(C) Displacement current is about 100 times larger than the conduction current

(D) The medium through which the EM wave is propagating is a dielectric

25. A proton of mass m and charge Q is moving in counter-clockwise direction in a crossed uniform magnetic field of induction \vec{B} pointed into the plane of the paper. If v and R are the velocity and radius of the orbit, then angular momentum p acquired by the particle is given by :
- (A) $p = QBR$
- (B) $p = \frac{QB}{R}$
- (C) $p = \frac{QB}{mR}$
- (D) $p = \frac{QBR}{m}$
26. If two operators \hat{A} and \hat{B} have a common eigenfunction ψ . What is the value of the commutator $[\hat{A}, \hat{B}]$?
- (A) 1
- (B) $i\hbar$
- (C) $\hat{A} - \hat{B}$
- (D) Zero
27. Standing wave with wave function $\psi(x) = A \sin kx$, (corresponding to particles of mass m) gives rise to current density equal to :
- (A) $|A|^2 \hbar k / m$
- (B) $|A|^2 \hbar k$
- (C) $|A|^2 (\sin kx \cos kx) / m$
- (D) Zero

28. A particle moves in one-dimensional potential $V(x)$. At $x = a$, if V has a finite discontinuity (jump), then which of the following is true for its wave function ϕ and its first derivative ϕ' at $x = a$?

- (A) Both ϕ and ϕ' are discontinuous
- (B) Both ϕ and ϕ' are continuous
- (C) ϕ is continuous and ϕ' must be discontinuous
- (D) ϕ is discontinuous and ϕ' must be continuous

29. The wave function of a particle moving in one-dimensional time independent potential $V(x)$ is represented by $\psi(x) = e^{-iax} + b$ where a and b are real constants.

This means that the potential $V(x)$ is of the form :

- (A) $V(x) \propto x$
- (B) $V(x) \propto x^2$
- (C) $V(x) = \text{constant}$
- (D) $V(x) = e^{-ax} + b$

30. In a quantum mechanical one-dimensional system, the Hamiltonian is :

$$H = \frac{p_x^2}{2m} + \frac{1}{2}m\omega^2 x^2 + \alpha x = H_0 + \alpha x$$

where α is very small. The eigenvalues of H_0 are $\hbar\omega(n + \frac{1}{2})$ with $\psi_n^{(0)}(x)$ as eigenfunctions. Which of the following is *correct* ?

- (A) The energy levels are not changed since all eigenfunctions $\psi_n^{(0)}(x)$ have definite parity
- (B) All energy levels are shifted by a constant amount
- (C) Only $n = \text{odd}$ energy eigenvalues are shifted
- (D) Only $n = \text{even}$ energy eigenvalues are shifted

31. Which of the following is an eigenfunction of linear momentum operator $\frac{\hbar}{i} \frac{\partial}{\partial x}$, such that the eigenfunction describes a particle moving in free space in the direction of positive x -axis, with zero uncertainty in the linear momentum ?

- (A) e^{-kx}
- (B) e^{ikx}
- (C) $\cos kx$
- (D) $\sin kx$

32. A system in one-dimension is in a state described by :

$$\psi(x, t) = A \exp\{i(px - Et)/\hbar\} +$$

$$B \exp\{-i(px + Et)/\hbar\}$$

A and B are complex numbers, p and E are real. The probability current density is given by :

- (A) p/m
- (B) $(|A| - |B|) p/m$
- (C) $(|A|^2 + |B|^2) p/m$
- (D) $(|A|^2 - |B|^2) p/m$

33. The expectation value of momentum for a bound state of finite square well potential (width a and depth V_0) is :

- (A) Zero
- (B) Depends on V_0
- (C) Depends on a
- (D) Depends on $V_0 a^2$

34. \vec{L} is quantum mechanical operator of orbital angular momentum. $\vec{L} \times \vec{L}$ is equal to :

- (A) 0
- (B) $i\hbar L$
- (C) $\hbar(l+1)\hbar^2$
- (D) L^2

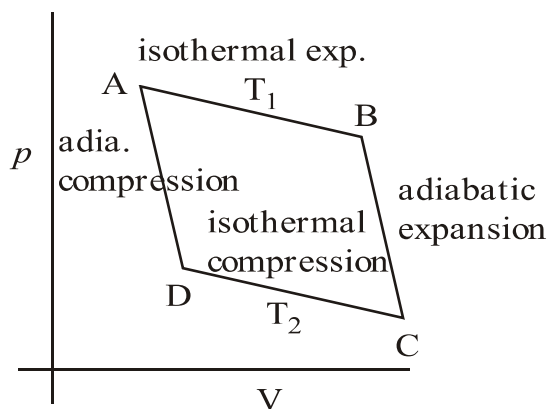
35. A constant volume ideal gas thermometer in thermal equilibrium with system A at temperature T_A measures a pressure p_A . When the same thermometer is brought in thermal equilibrium with another system B at temperature $T_A/3$, the pressure in the thermometer will now be :

- (A) $p_A/3$
- (B) $p_A^2/3$
- (C) $3p_A$
- (D) $p_A/\sqrt{3}$

36. Consider a process in which a system is in thermal equilibrium with a heat reservoir at temperature T . The pressure of the system remains constant at the pressure of the reservoir p . Such a process is called :

- (A) Isothermal process
- (B) Adiabatic and isochoric process
- (C) Isochoric process
- (D) Isobaric and isothermal process

37. A Carnot engine operates between two temperatures T_1 and T_2 as shown in the diagram.



The maximum efficiency of the engine η_{\max} is given by :

- (A) $\eta_{\max} = 1 - \frac{T_1}{T_2}$
- (B) $\eta_{\max} = \frac{T_2}{T_1}$
- (C) $\eta_{\max} = 1 + \frac{T_2}{T_1}$
- (D) $\eta_{\max} = 1 - \frac{T_2}{T_1}$

38. A gas is contained in a box of volume V at pressure P and temperature T . One wall of the box is moved at a very high speed so that the volume is doubled. Which of the following is *true* ?

- (A) P , T both increase
- (B) P , T both decrease
- (C) P increases, T decreases
- (D) P decreases, T increases

39. A thermodynamic system is characterized by independent variables entropy S and volume V and dependent variables pressure P and temperature T . Then which of the following is *true* ?

- (A) $\left(\frac{\partial P}{\partial S}\right)_V = \left(\frac{\partial T}{\partial V}\right)_S$
- (B) $\left(\frac{\partial P}{\partial S}\right)_V = -\left(\frac{\partial T}{\partial V}\right)_S$
- (C) $\left(\frac{\partial P}{\partial T}\right)_V = -\left(\frac{\partial T}{\partial V}\right)_S$
- (D) $\left(\frac{\partial P}{\partial T}\right)_V = \left(\frac{\partial T}{\partial V}\right)_S$

40. A system consists of 3 independent particles. Each particle can occupy any of the two energy states with energy 0 and ϵ . The system is in thermal equilibrium with a heat reservoir at temperature T . Its partition function will be :
- (A) $Z = 1 + 3e^{-\beta\epsilon} + 3e^{-2\beta\epsilon} + e^{-3\beta\epsilon}$
 (B) $Z = 1 + e^{-\beta\epsilon}$
 (C) $Z = 1 + e^{-3\beta\epsilon}$
 (D) $Z = 1 + e^{-\beta\epsilon} + e^{-2\beta\epsilon} + e^{-3\beta\epsilon}$
41. Considering the Maxwell-Boltzmann distribution of speeds of molecules, the average speed of the molecule of mass m at temperature T is :
- (A) $\sqrt{\frac{3kT}{m}}$
 (B) $\sqrt{\frac{8kT}{\pi m}}$
 (C) 0
 (D) $\sqrt{\frac{2kT}{m}}$
42. In the Debye model of specific heat of solids, the specific heat at low temperature has the following temperature dependence :
- (A) $T^{3/2}$
 (B) T^2
 (C) T^3
 (D) $T^{1/2}$
43. In Signal generators :
- (A) Energy is created
 (B) Energy is generated
 (C) Energy is converted from a simple d.c. source into a.c. energy at some specific frequency
 (D) Energy is maintained

44. In an experiment, the voltage across a $10\text{ k}\Omega$ resistor is applied to CRO. The screen shows a sinusoidal signal of total vertical occupancy 3 cm and total horizontal occupancy of 2 cm. The front-panel controls of V/div and time/div are on 2 V/div and 2 ms/div respectively. Find out the frequency of the waveform :

- (A) 250 kHz
- (B) 250 Hz
- (C) 2.5 kHz
- (D) 25 kHz

45. When two rotary pumps are connected in series to a vacuum chamber, the ultimate pressure can be achieved is closest to :

- (A) 1×10^{-6} Torr
- (B) 1×10^{-5} Torr
- (C) 1×10^{-3} Torr
- (D) 1×10^{-9} Torr

46. Which of the following noise can be reduced by integration of the signal ?

- (A) White noise
- (B) Shot noise
- (C) Flicker noise
- (D) Environmental noise

47. In which of the following detector P-N junction diode is used ?
- (A) G.M. counter
- (B) Scintillation counter
- (C) Lithium drifted detector
- (D) Ionisation chamber
48. An oil drop has a weight of 3.2×10^{-13} N. With an electric field of 5×10^5 V/m between the plates of Millikan's oil-drop apparatus, this drop is observed to be essentially balanced. The charge on the drop in electron charge units is :
- (A) 2 electrons
- (B) 4 electrons
- (C) 3 electrons
- (D) 6 electrons
49. A McLeod gauge has a volume of 100 ml and a capillary of 0.5 mm diameter. The pressure indicated by a reading of 25 cm of mercury corresponds to :
- (A) 24.54×10^{-9}
- (B) 12.27×10^{-10}
- (C) 1.227×10^{-3}
- (D) 2.454×10^{-8}
50. A transparent film of glass of refractive index 1.5 is introduced normally in the path of one of the interfering beams of Michelson's interferometer which is illuminated with light of wavelength 4800 Å. This causes 500 dark fringes to sweep across the field of view. The thickness of the film is :
- (A) 0.012 cm
- (B) 0.024 cm
- (C) 0.005 cm
- (D) 0.015 cm

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