

Estd: 2004

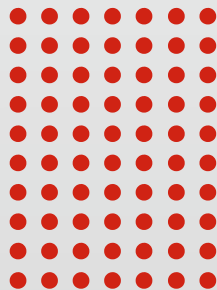


No. 1 in Eastern U.P.

MOMENTUM

ANSWER KEY 

NEET-2022



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छात्रसंघ चौक, गोरखपुर

NEET-2022

Instruction

महत्वपूर्ण निर्देश :

- उत्तर पत्र इस परीक्षा पुस्तिका के अन्दर रखा है। जब आपको परीक्षा पुस्तिका खोलने को कहा जाए, तो उत्तर पत्र निकाल कर ध्यानपूर्वक कार्यालय प्रतिलिपि पर केवल नीले/काले बॉल पॉइंट पेन से विवरण भरें।
- परीक्षा की अवधि 3 घंटा है एवं परीक्षा पुस्तिका में भौतिकी, रसायनशास्त्र एवं जीवविज्ञान (वनस्पतिविज्ञान एवं प्राणिविज्ञान) विषयों से 200 बहुविकल्पीय प्रश्न हैं (4 विकल्पों में से एक सही उत्तर है)। प्रत्येक विषय में 50 प्रश्न हैं जिनको निम्न वर्णानुसार दो अनुभागों (A तथा B) में विभाजित किया गया है :
(a) अनुभाग A के प्रत्येक विषय में 35 (पैंतीस) (प्रश्न संख्या 1 से 35, 51 से 85, 101 से 135 एवं 151 से 185) प्रश्न हैं। सभी प्रश्न अनिवार्य हैं।
(b) अनुभाग B के प्रत्येक विषय में 15 (पंद्रह) (प्रश्न संख्या 36 से 50, 86 से 100, 136 से 150 एवं 186 से 200) प्रश्न हैं। अनुभाग B से परीक्षार्थियों को प्रत्येक विषय से 15 (पंद्रह) में से कोई 10 (दस) प्रश्न करने होंगे।
परीक्षार्थियों को सुझाव है कि प्रश्नों के उत्तर देने के पूर्व अनुभाग B में प्रत्येक विषय के सभी 15 प्रश्नों को पढ़ें। यदि कोई परीक्षार्थी 10 प्रश्न से अधिक प्रश्नों का उत्तर देता है तो उसके द्वारा उत्तरित प्रथम 10 प्रश्नों का ही मूल्यांकन किया जाएगा।
- प्रत्येक प्रश्न 4 अंक का है। प्रत्येक सही उत्तर के लिए परीक्षार्थी को 4 अंक दिए जाएंगे। प्रत्येक गलत उत्तर के लिए कुल योग में से एक अंक घटाया जाएगा। अधिकतम अंक 720 हैं।
- इस पृष्ठ पर विवरण अंकित करने एवं उत्तर पत्र पर निशान लगाने के लिए केवल नीले/काले बॉल पॉइंट पेन का प्रयोग करें।
- रफ कार्य इस परीक्षा पुस्तिका में निर्धारित स्थान पर ही करें।

Important Instructions :

- The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on OFFICE Copy carefully with blue/black ball point pen only.
- The test is of 3 hours duration and the Test Booklet contains 200 multiple-choice questions (four options with a single correct answer) from Physics, Chemistry and Biology (Botany and Zoology). 50 questions in each subject are divided into two Sections (A and B) as per details given below :
(a) Section A shall consist of 35 (Thirty-five) Questions in each subject (Question Nos – 1 to 35, 51 to 85, 101 to 135 and 151 to 185). All questions are compulsory.
(b) Section B shall consist of 15 (Fifteen) questions in each subject (Question Nos – 36 to 50, 86 to 100, 136 to 150 and 186 to 200). In Section B, a candidate needs to attempt any 10 (Ten) questions out of 15 (Fifteen) in each subject.
Candidates are advised to read all 15 questions in each subject of Section B before they start attempting the question paper. In the event of a candidate attempting more than ten questions, the first ten questions answered by the candidate shall be evaluated.
- Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For each incorrect response, one mark will be deducted from the total scores. The maximum marks are 720.
- Use Blue/Black Ball Point Pen only for writing particulars on this page/markings responses on Answer Sheet.
- Rough work is to be done in the space provided for this purpose in the Test Booklet only.

प्रश्नों के अनुवाद में किसी अस्पष्टता की स्थिति में, अंग्रेजी संस्करण को ही अंतिम माना जायेगा।

In case of any ambiguity in translation of any question, English version shall be treated as final.

परीक्षार्थी का नाम (बड़े अक्षरों में) :

Name of the Candidate (in Capitals) : _____

अनुक्रमांक : अंकों में

Roll Number : in figures _____

: शब्दों में

: in words _____

परीक्षा केन्द्र (बड़े अक्षरों में) :

Centre of Examination (in Capitals) : _____

परीक्षार्थी के हस्ताक्षर :

निरीक्षक के हस्ताक्षर :

Candidate's Signature : _____ Invigilator's Signature : _____

Facsimile signature stamp of

Centre Superintendent : _____

Section - A (Physics)

1. In half wave rectification, if the input frequency is 60 Hz, then the output frequency would be :

(1) 120 Hz
 (2) zero
 (3) 30 Hz
 (4) 60 Hz

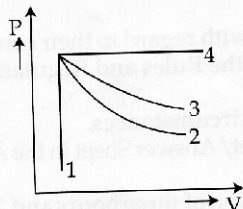
2. The angular speed of a fly wheel moving with uniform angular acceleration changes from 1200 rpm to 3120 rpm in 16 seconds. The angular acceleration in rad/s^2 is :

(1) 104π
 (2) 2π
 (3) 4π
 (4) 12π

3. A square loop of side 1 m and resistance 1Ω is placed in a magnetic field of 0.5 T. If the plane of loop is perpendicular to the direction of magnetic field, the magnetic flux through the loop is :

(1) zero weber
 (2) 2 weber
 (3) 0.5 weber
 (4) 1 weber

4. An ideal gas undergoes four different processes from the same initial state as shown in the figure below. Those processes are adiabatic, isothermal, isobaric and isochoric. The curve which represents the adiabatic process among 1, 2, 3 and 4 is :



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

5. The ratio of the distances travelled by a freely falling body in the 1st, 2nd, 3rd and 4th second :

(1) 1 : 1 : 1 : 1
 (2) 1 : 2 : 3 : 4
 (3) 1 : 4 : 9 : 16
 (4) 1 : 3 : 5 : 7

6. When light propagates through a material medium of relative permittivity ϵ_r and relative permeability μ_r , the velocity of light, v is given by : (c - velocity of light in vacuum)

(1) $v = \frac{c}{\sqrt{\epsilon_r \mu_r}}$

(2) $v = c$

(3) $v = \sqrt{\frac{\mu_r}{\epsilon_r}}$

(4) $v = \sqrt{\frac{\epsilon_r}{\mu_r}}$

7. The peak voltage of the ac source is equal to :

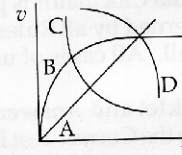
(1) $1/\sqrt{2}$ times the rms value of the ac source
 (2) the value of voltage supplied to the circuit
 (3) the rms value of the ac source

(4) $\sqrt{2}$ times the rms value of the ac source

8. In a Young's double slit experiment, a student observes 8 fringes in a certain segment of screen when a monochromatic light of 600 nm wavelength is used. If the wavelength of light is changed to 400 nm, then the number of fringes he would observe in the same region of the screen is :

(1) 12
 (2) 6
 (3) 8
 (4) 9

9. A spherical ball is dropped in a long column of highly viscous liquid. The curve in the graph shown, which represents the speed of the ball as a function of time (t) is :



(1) D
 (2) A
 (3) B
 (4) C

10. An electric lift with a maximum load of 20 (lift + passengers) is moving up with a constant speed of 1.5 ms^{-1} . The frictional force opposing the motion is 3000 N. The minimum power delivered by the motor to the lift in watts is : ($g = 10 \text{ ms}^{-2}$)

(1) 23500
 (2) 23000
 (3) 20000
 (4) 34500



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Excellent Faculty



We have a highly qualified, well-trained and experienced faculty.

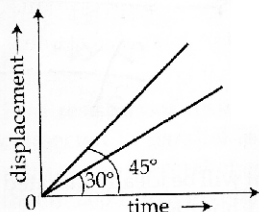
We have a systematic recruitment and training program for our faculty members.

We recruit highly qualified teachers from best colleges, premier universities and from esteemed educational institutions.

11. Two hollow conducting spheres of radii R_1 and R_2 ($R_1 \gg R_2$) have equal charges. The potential would be:

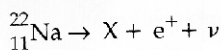
- (1) dependent on the material property of the sphere
- (2) more on bigger sphere
- (3) more on smaller sphere
- (4) equal on both the spheres

12. The displacement-time graphs of two moving particles make angles of 30° and 45° with the x-axis as shown in the figure. The ratio of their respective velocity is :



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

13. In the given nuclear reaction, the element X is :



- (1) ${}_{12}^{22}\text{Mg}$
- (2) ${}_{11}^{23}\text{Na}$
- (3) ${}_{10}^{23}\text{Ne}$
- (4) ${}_{10}^{22}\text{Ne}$

14. The ratio of the radius of gyration of a thin uniform disc about an axis passing through its centre and normal to its plane to the radius of gyration of the disc about its diameter is :

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

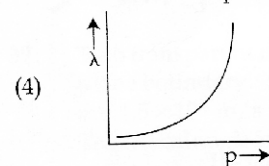
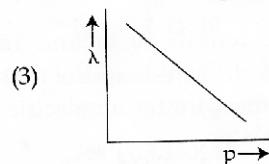
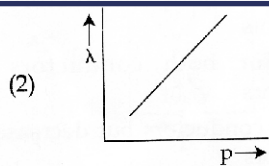
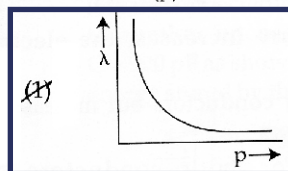
15. If a soap bubble expands, the pressure inside the bubble :

- (1) is equal to the atmospheric pressure
- (2) decreases
- (3) increases
- (4) remains the same

16. A shell of mass m is at rest initially. It explodes into three fragments having mass in the ratio $2 : 2 : 1$. If the fragments having equal mass fly off along mutually perpendicular directions with speed v , the speed of the third (lighter) fragment is :

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

17. The graph which shows the variation of the de Broglie wavelength (λ) of a particle and its associated momentum (p) is :



18. Given below are two statements :

Statement I :

Biot-Savart's law gives us the expression for the magnetic field strength of an infinitesimal current element (Idl) of a current carrying conductor only.

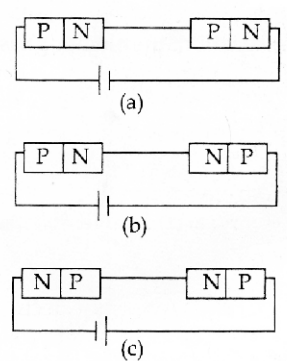
Statement II :

Biot-Savart's law is analogous to Coulomb's inverse square law of charge q , with the former being related to the field produced by a scalar source, Idl while the latter being produced by a vector source, q .

In light of above statements choose the **most appropriate** answer from the options given below :

- (1) Statement I is incorrect and Statement II is correct
- (2) Both Statement I and Statement II are correct
- (3) Both Statement I and Statement II are incorrect
- (4) Statement I is correct and Statement II is incorrect



19. When two monochromatic lights of frequency, ν and $\frac{\nu}{2}$ are incident on a photoelectric metal, their stopping potential becomes $\frac{V_s}{2}$ and V_s respectively. The threshold frequency for this metal is :
- (1) $\frac{3}{2}\nu$
 (2) 2ν
 (3) 3ν
 (4) $\frac{2}{3}\nu$
20. As the temperature increases, the electrical resistance :
- (1) decreases for conductors but increases for semiconductors
 (2) increases for both conductors and semiconductors
 (3) decreases for both conductors and semiconductors
 (4) increases for conductors but decreases for semiconductors
21. A copper wire of length 10 m and radius $(10^{-2}/\sqrt{\pi})$ m has electrical resistance of $10\ \Omega$. The current density in the wire for an electric field strength of 10 (V/m) is :
- (1) 10^3 A/m²
 (2) 10^4 A/m²
 (3) 10^6 A/m²
 (4) 10^{-5} A/m²
22. Match List - I with List - II :
- | List - I | List - II |
|-------------------------|-------------------|
| (Electromagnetic waves) | (Wavelength) |
| (a) AM radio waves | (i) 10^{-10} m |
| (b) Microwaves | (ii) 10^2 m |
| (c) Infrared radiations | (iii) 10^{-2} m |
| (d) X-rays | (iv) 10^{-4} m |
- Choose the correct answer from the options given below :
- (1) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)
 (2) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)
 (3) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)
 (4) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
23. Plane angle and solid angle have :
- (1) Both units and dimensions
 (2) Units but no dimensions
 (3) Dimensions but no units
 (4) No units and no dimensions
24. If the initial tension on a stretched string is doubled, then the ratio of the initial and final speeds of a transverse wave along the string is :
- (1) 1 : 2
 (2) 1 : 1
 (3) $\sqrt{2} : 1$
 (4) $1 : \sqrt{2}$
25. Two objects of mass 10 kg and 20 kg respectively are connected to the two ends of a rigid rod of length 10 m with negligible mass. The distance of the center of mass of the system from the 10 kg mass is :
- (1) 5 m
 (2) $\frac{10}{3}$ m
 (3) $\frac{20}{3}$ m
 (4) 10 m
26. The energy that will be ideally radiated by a 100 kW transmitter in 1 hour is :
- (1) 1×10^5 J
 (2) 36×10^7 J
 (3) 36×10^4 J
 (4) 36×10^5 J
27. 
- In the given circuits (a), (b) and (c), the potential drop across the two p-n junctions are equal in :
- (1) Both circuits (a) and (c)
 (2) Circuit (a) only
 (3) Circuit (b) only
 (4) Circuit (c) only
28. A biconvex lens has radii of curvature, 20 cm each. If the refractive index of the material of the lens is 1.5, the power of the lens is :
- (1) infinity
 (2) +2D
 (3) +20 D
 (4) +5D

29. A body of mass 60 g experiences a gravitational force of 3.0 N, when placed at a particular point. The magnitude of the gravitational field intensity at that point is :

- (1) 180 N/kg
 (2) 0.05 N/kg
 (3) 50 N/kg
 (4) 20 N/kg

30. The angle between the electric lines of force and the equipotential surface is :

- (1) 180°
 (2) 0°
 (3) 45°
 (4) 90°

31. Two resistors of resistance, 100 Ω and 200 Ω are connected in parallel in an electrical circuit. The ratio of the thermal energy developed in 100 Ω to that in 200 Ω in a given time is :

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

32. A light ray falls on a glass surface of refractive index $\sqrt{3}$, at an angle 60°. The angle between the refracted and reflected rays would be :

- (1) 120°
 (2) 30°
 (3) 60°
 (4) 90°

33. Let T_1 and T_2 be the energy of an electron in the first and second excited states of hydrogen atom, respectively. According to the Bohr's model of an atom, the ratio $T_1 : T_2$ is :

- (1) 9 : 4
 (2) 1 : 4
 (3) 4 : 1
 (4) 4 : 9

34. A long solenoid of radius 1 mm has 100 turns per mm. If 1 A current flows in the solenoid, the magnetic field strength at the centre of the solenoid is :

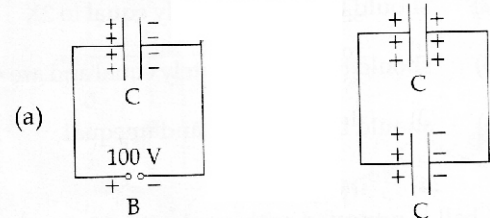
- (1) 6.28×10^{-4} T
 (2) 6.28×10^{-2} T
 (3) 12.56×10^{-2} T
 (4) 12.56×10^{-4} T

35. The dimensions [$MLT^{-2}A^{-2}$] belong to the :

- (1) electric permittivity
 (2) magnetic flux
 (3) self inductance
 (4) magnetic permeability

Section - B (Physics)

36. A capacitor of capacitance $C = 900$ pF is charged fully by 100 V battery B as shown in figure (a). Then it is disconnected from the battery and connected to another uncharged capacitor of capacitance $C = 900$ pF as shown in figure (b). The electrostatic energy stored by the system (b) is :



- (1) 1.5×10^{-6} J
 (2) 4.5×10^{-6} J
 (3) 3.25×10^{-6} J
 (4) 2.25×10^{-6} J

37. Two transparent media A and B are separated by a plane boundary. The speed of light in those media are 1.5×10^8 m/s and 2.0×10^8 m/s, respectively. The critical angle for a ray of light for these two media is :

- (1) $\tan^{-1}(0.750)$
 (2) $\sin^{-1}(0.500)$
 (3) $\sin^{-1}(0.750)$
 (4) $\tan^{-1}(0.500)$

38. A series LCR circuit with inductance 10 H, capacitance 10 μ F, resistance 50 Ω is connected to an ac source of voltage, $V = 200 \sin(100t)$ volt. If the resonant frequency of the LCR circuit is ν_0 and the frequency of the ac source is ν , then :

- (1) $\nu = 100$ Hz ; $\nu_0 = \frac{100}{\pi}$ Hz
 (2) $\nu_0 = \nu = 50$ Hz
 (3) $\nu_0 = \nu = \frac{50}{\pi}$ Hz
 (4) $\nu_0 = \frac{50}{\pi}$ Hz, $\nu = 50$ Hz

Special Classes

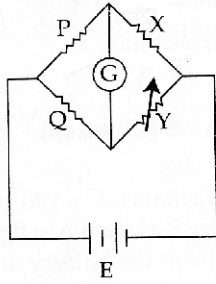
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छात्रसंघ चौक

Not every student comes to MOMENTUM with the acumen to be a topper. They are trained to become one at MOMENTUM. Weak students are paid extra attention to cope up with brilliant students. Simultaneously, brilliant students are also trained to improve upon their good performances and outshine others.



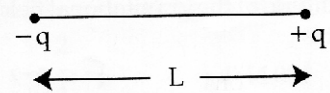
39. A wheatstone bridge is used to determine the value of unknown resistance X by adjusting the variable resistance Y as shown in the figure. For the most precise measurement of X , the resistances P and Q :



- (1) do not play any significant role
 (2) should be approximately equal to $2X$
 (3) should be approximately equal and are small
 (4) should be very large and unequal
40. A ball is projected with a velocity, 10 ms^{-1} , at an angle of 60° with the vertical direction. Its speed at the highest point of its trajectory will be:
- (1) 10 ms^{-1}
 (2) Zero
 (3) $5\sqrt{3} \text{ ms}^{-1}$
 (4) 5 ms^{-1}

41. From Ampere's circuital law for a long straight wire of circular cross-section carrying a steady current, the variation of magnetic field in the inside and outside region of the wire is:
- (1) a linearly decreasing function of distance upto the boundary of the wire and then a linearly increasing one for the outside region.
 (2) uniform and remains constant for both the regions.
 (3) a linearly increasing function of distance upto the boundary of the wire and then linearly decreasing for the outside region.
 (4) a linearly increasing function of distance r upto the boundary of the wire and then decreasing one with $1/r$ dependence for the outside region.

42. Two point charges $-q$ and $+q$ are placed at a distance of L , as shown in the figure.



The magnitude of electric field intensity at a distance R ($R \gg L$) varies as:

- (1) $\frac{1}{R^6}$
 (2) $\frac{1}{R^2}$
 (3) $\frac{1}{R^3}$
 (4) $\frac{1}{R^4}$
43. The volume occupied by the molecules contained in 4.5 kg water at STP, if the intermolecular forces vanish away is:
- (1) 5.6 m^3
 (2) $5.6 \times 10^6 \text{ m}^3$
 (3) $5.6 \times 10^3 \text{ m}^3$
 (4) $5.6 \times 10^{-3} \text{ m}^3$
44. Two pendulums of length 121 cm and 100 cm start vibrating in phase. At some instant, the two are at their mean position in the same phase. The minimum number of vibrations of the shorter pendulum after which the two are again in phase at the mean position is:
- (1) 8
 (2) 11
 (3) 9
 (4) 10
45. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).
- Assertion (A):**
 The stretching of a spring is determined by the shear modulus of the material of the spring.
- Reason (R):**
 A coil spring of copper has more tensile strength than a steel spring of same dimensions.
- In the light of the above statements, choose the most appropriate answer from the options given below:
- (1) (A) is false but (R) is true
 (2) Both (A) and (R) are true and (R) is the correct explanation of (A)
 (3) Both (A) and (R) are true and (R) is not the correct explanation of (A)
 (4) (A) is true but (R) is false



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To Make their Child competent & Successful

In a world where competition is getting stiffer with each passing day, the pressure to outperform others may add to the rising stress levels in students. Parental involvement is, therefore, extremely important for a child to do well in exams. It is imperative for a parent to understand his/her child's mental, psychological and emotional state of mind.

Er. Sanjeev Kumar

Founder & Managing Director, MOMENTUM Since 2004

Role of Parents

16. Match List - I with List - II :

| List - I | | List - II | |
|----------|--------------------------------|-----------|---------------------|
| (a) | Gravitational constant (G) | (i) | $[L^2T^{-2}]$ |
| (b) | Gravitational potential energy | (ii) | $[M^{-1}L^3T^{-2}]$ |
| (c) | Gravitational potential | (iii) | $[LT^{-2}]$ |
| (d) | Gravitational intensity | (iv) | $[ML^2T^{-2}]$ |

Choose the correct answer from the options given below :

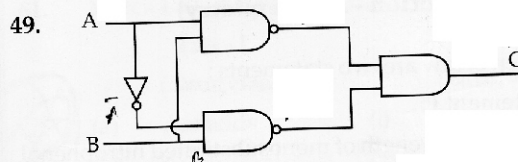
- (1) (a) - (iv), (b) - (ii), (c) - (i), (d) - (iii)
 (2) (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii)
 (3) (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)
 (4) (a) - (ii), (b) - (iv), (c) - (iii), (d) - (i)

47. A nucleus of mass number 189 splits into two nuclei having mass number 125 and 64. The ratio of radius of two daughter nuclei respectively is :

- (1) 25 : 16
 (2) 1 : 1
 (3) 4 : 5
 (4) 5 : 4

48. The area of a rectangular field (in m^2) of length 55.3 m and breadth 25 m after rounding off the value for correct significant digits is :

- (1) 14×10^2
 (2) 138×10^1
 (3) 1382
 (4) 1382.5



The truth table for the given logic circuit is :

(1)

| A | B | C |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

(2)

| A | B | C |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

(3)

| A | B | C |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

(4)

| A | B | C |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

50. A big circular coil of 1000 turns and average radius 10 m is rotating about its horizontal diameter at 2 rad s^{-1} . If the vertical component of earth's magnetic field at that place is $2 \times 10^{-5} \text{ T}$ and electrical resistance of the coil is 12.56Ω , then the maximum induced current in the coil will be :

- (1) 2 A
 (2) 0.25 A
 (3) 1.5 A
 (4) 1 A

About to MOMENTUM



MOMENTUM

छात्रसंघ चौक

Competition for Medical Aspirant is everywhere and it is becoming tougher with each passing day. Many times, the dream of student who wish to become a doctor remain a dream due to lack of proper guidance. If they are mentored in the right way for the NEET, success could be theirs.

With the view of helping the dream of mass, MOMENTUM was founded in 2004 by Er. Sanjeev Kumar. Started as a humble coaching institute with barely 100 students, a simple vision and support from a few well-wishers, MOMENTUM has today become a true phenomenon. A phenomenon that is one of its kind and has become mightier with each passing year.

