NEW STANDARD ACADEMY

Test Type - 02

Do not open this Test Booklet until you are asked to do so.

11-08-2025

JEE(MAIN): 11th Undergoing Students

Read carefully the Instructions on the Back Cover of this Test Booklet.

Important Instructions :

1. Immediately fill in the form number on this page of the Test Booklet with Blue/Black Ball Point Pen. Use of pencil is strictly prohibited.
2. The candidates should not write their Form Number anywhere else (except in the specified space) on the Test Booklet/Answer Sheet.
3. The Test Booklet consists of 90 questions.
4. There are three parts in the question paper 1,2,3 consisting of Physics, Chemistry and Mathematics having 30 questions in each subject and each subject having Two sections. (i) Section-I contains 20 multiple choice questions with only one correct option. Marking scheme : +4 for correct answer, 0 if not attempted and –1 in all other cases. (ii) Section-II contains 10 Numerical Value Type questions. Attempt any 5 questions. First 5 attempted questions will be considered for marking. Marking scheme : +4 for correct answer, 0 if not attempted and –1 in all other cases.
5. Use Blue/Black Ball Point Pen only for writting particulars/marking responses on Side –1 and Side–2 of the Answer Sheet. Use of pencil is strictly prohibited.
6. No candidate is allowed to carry any textual material, printed or written, bits of papers, mobile phone any electronic device etc, except the Identity Card inside the examination hall/room.
7. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
8. On completion of the test, the candidate must hand over the Answer Sheet to the invigilator on duty in the Room/ Hall. However, the candidate are allowed to take away this Test Booklet with them.

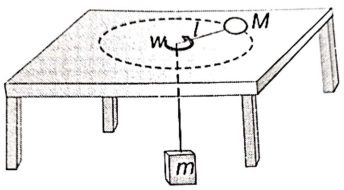
Name of the Candidate(In Capitals) _____

Date of Examintation _____

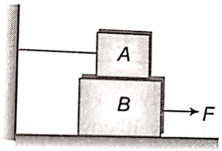
Candidate`s Signature:_____ Invigilator`s Signature: _____

PHYSICS

1. A string of length l = 1 m is fixed at one end and carries a mass of 100 gm at other end. The string makes $\sqrt{5}/\pi$ revolutions per second about a vertical axis passing through its second end. What is the angle of inclination of the string with the vertical?
   (a) 30° (b) 45°
   (c) 60° (d) 75°
2. A 8 kg stone tied at the end of a string 1 metre long is whirled in a vertical circle. At the instant when the string makes an angle theta with the vertical, the speed of the stone is $4ms^{-1}$ and the tension in the thread is 104 newton. Then is
   (a) 0^0 (b) 30^0
   (c) 60^0 (d) None of these
3. A train A runs from east to west and another train B of the same mass runs from west to east at the same speed along the equator. A presses the track with a force F_1 and B presses the track with a force F_2
   (a) $F_1 > F_2$ (b) $F_1 < F_2$
   (c) $F_1 = F_2$
   (d) The information is insufficient to find the relation between F_1 and F_2
4. A curved road of 50 m in radius is banked to correct angle for a given speed. If the speed is to be doubled keeping the same banking angle, the radius of curvature of the road should be changed to
   (a) 200 m (b) 100 m
   (c) 50 m (d) none of the above
5. A block of mass M is situated on a smooth horizontal frictionless table. A thread tied to the block passes through a hole in the table and carries a mass m at its other end. If the length of the thread above the table is l, what should be the value of m so that it may remain suspended at a constant height and the block M moves in a circular path with an angular velocity on the table?

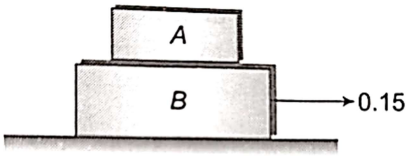


   (a) $\frac{Ml\omega^2}{g}$ (b) $\frac{Ml\omega^2}{3g}$
   (c) $\frac{Ml\omega^2}{5g}$ (d) $\frac{2Ml^2}{g}$
6. A person wants to drive on the vertical surface of a large cylindrical wooden 'well' commonly known as 'deathwell' in a circus. The radius of the well' is 2 meter, and the coefficient of friction between the tyres of the motorcycle and the wall of the well is 0.2, the minimum speed the motorcyclist must have in order to prevent slipping should be
   (a) 10 m/s (b) 15 m/s
   (c) 20 m/s (d) 25 m/s
7. Water in a bucket is whirled in a vertical circle with a string attached to it. The water does not fall down even when the bucket is inverted at the top of its path. We conclude that in this position
   (a) $mg = mv^2/r$
   (b) mg is greater than mv^2/r
   (c) mg is not greater than mv^2/r
   (d) none of these
8. A stone of mass m tied to a string of length l is rotated in a circle with the other end of the string as the centre. The speed of the stone is v. If the string breaks, the stone will move
   (a) towards the centre
   (b) away from the centre
   (c) along a tangent
   (d) will stop
9. A coin placed on a rotating turntable just slips if it is placed at a distance of 4 cm from the centre. If the angular velocity of the turntable is doubled, it will just slip at a distance of
   (a) 4 cm (b) 2 cm
   (c) 1 cm (d) 8 cm
10. Three identical cars A, B and C are moving at the same speed on three bridges. The car A goes on a plane bridge, B on a bridge convex upward and C goes on a bridge concave upward. Let F_A' F_B and F_C be the normal forces exerted by the cars on the bridges when they are at the middle of bridges.
    (a) F_A is maximum of the three forces.
    (b) F_B is maximum of the three forces.
    (c) F_C maximum of the three forces.
    (d) $F_A = F_B = F_C$
11. A block A with mass 100 kg is resting on another block B of mass 200 kg. As shown in the figure a horizontal rope tied to a wall holds it. The coefficient of friction between A and B is 0.2 while coefficient of friction between B and the ground is 0.3. The minimum required force F to start moving B will be



    (a) 900 N (b) 100 N
    (c) 1100 N (d) 1200 N

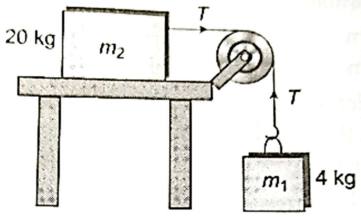
12. A body A of mass 1 kg rests on a smooth surface. Another body B of mass 0.2 kg is placed over A as shown. The coefficient of static friction between A and B is 0.15. B will begin to slide on A if A is pulled with a force greater than



(a) 1.764 N (b) 0.1764 N
(c) 0.3 N
(d) It will not slide for any F

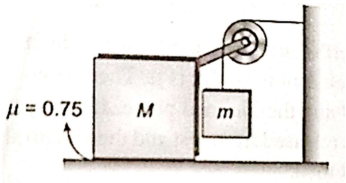
13. A block A of mass 2 kg rests on another block B of mass 8 kg which rests on a horizontal floor. The coefficient of friction between A and B is 0.2, while that between B and floor is 0.5. When a horizontal force of 25 N is applied on the block B, the force of friction between A and B is
(a) Zero (b) 3.9 N
(c) 5.0 N (d) 49 N

14. The coefficient of kinetic friction is 0.03 in the diagram where mass m_2 = 20kg and m_1 = 4kg The acceleration of the block (g = 10ms^{-2})



(a) 1.8m s^{-2} (b) 0.8ms^{-2}
(c) 1.4ms^{-2} (d) 0.4ms^{-2}

15. Two blocks (m and M) are arranged as shown. If there is friction between ground and M only and other surfaces are frictionless. The coefficient of friction between ground and M is μ = 0.75. The maximum ratio of m and M (m/M) so that the system remains at rest



(a) 1/4 (b) 3
(c) 1/3 (d) none of these

CHEMISTRY

16. Point out incorrect statement about resonance.
(a) Resonance structures should have equal energy
(b) In resonance structures, the constituent atoms should be in the same position
(c) In resonance structures, there should not be the same number of electron pairs
(d) Resonance structures should differ only in the location of electrons around the constituent atoms

17. Lattice energy of an ionic compound depends upon
(a) Charge on the ion only
(b) Size of the ion only
(c) Packing of ions only
(d) Charge on the ion and size of the ion

18. Octet rule is not followed in
(a) CCl_4, N_2O_4, N_2O_5
(b) BF_3 $BeCl_2$, NO_2
(c) NaCl, $MgCl_2$, MgO
(d) PCl_3, NH_3, H_2O

19. Which of the following can't form π-bond
(a) H (b) C
(c) N (d) O

20. HCN and HNC molecules have equal number of
(a) lone pairs and σ -bonds
(b) σ-bonds and π-bonds
(c) π-bonds and lone pair
(d) lone pairs, σ -bonds and π –bonds

21. The molecule C_3O_2 has a linear structure. This compound has
(a) 4σ and 4π bonds (b) 3σ and 2π bonds
(c) 2σ and 3 π bonds (d) 3 σ and 4 π bonds

22. The correct order of hybridization of the central atom in the following species NH_3, $[PtCl_4]^{2-}$, PCl_5 and $BC1_3$ is
(a) dsp², dsp³, sp² ,sp³ (2) s p³ dsp², dsp³, sp²
(c) dsp², sp² sp³ dsp³ (d) dsp², sp³ sp² dsp³

23. In a regular octahedral molecule, MX_6 the number X - M - X bonds at 180° is
(a) Six (b) Four
(c) Three (d) Two

24. Which of the following molecules have unequal bond lengths?
(a) NF_3 (b) SF_4
(c) SF_6 (d) PF_5

25. Which carbon is most electronegative?
(a) sp³ hybridised carbon
(b) sp hybridized carbon
(c) sp² hybridised carbon
(d) s p³d hybridized carbon

26. Based on VSEPR model, AX_4E representation is for
(a) SF_4 (b) XeF_4
(c) SiF_4 (d) B F_4^-

27. Which has the least bond angle?
(a) NH_3 (b) BeF_2
(c) H_2O (4) CH_4

28. In the series ethane, ethylene and acetylene, the C-H bond energy is
    (a) The same in all the three compounds
    (b) Greatest in ethane
    (c) Greatest in ethylene
    (d) Greatest in acetylene
29. As the p-character increases, the bond angle in hybrid orbitals formed by s and atomic orbitals.
    (a) Decreases (b) Increases
    (c) Doubles (c) Remains unchanged
30. In a polar molecule, the ionic charge is 4.8×10^{-10} e.s.u. If the inter ionic distance is one Å unit, then the dipole moment is
    (a) 41.8 debye (b) 4.18 debye
    (c) 4.8 debye (d) 0.48 debye

MATHS

31. If sixth term of a H.P. $\frac{1}{61}$ and its tenth term is $\frac{1}{105}$ then first term of that H.P. is
    (a) $\frac{1}{28}$ (b) $\frac{1}{39}$
    (c) $\frac{1}{6}$ (d) $\frac{1}{17}$
32. Concentric circles of radii 1, 2, 3, ..., 100 cm are drawn. The interior of the smallest circle is coloured red and the angular regions are coloured alternately green and red, se that no two adjacent regions are of the same colour. The total area of the green regions in sq. cm is equal to
    (a) 1000π (b) $5050\,\pi$
    (c) $4950\,\pi$ (4) $5151\,\pi$
33. Let $a + ar_1 + a r_1^2 + ... + \infty$ be and $a + ar_2 + ar_2^2 + \ldots + \infty$ be two infinite series of positive numbers with the same first term. The sum of the first series is r_1 and the sum of the second series is r_2 The value of $(r_1 + r_2)$ is
    (a) 1 /2 (b) 1
    (c) $\frac{\sqrt{5}+1}{2}$ (d) 2
34. If x,y and z are in H.P then the value of expression $\log_e (x+z) + \log_e(x-2y+z)$ will be
    (a) $\log_e(x-z)$ (b) $2\log_e(x-z)$
    (c) $3\log_e(x-z)$ (d) $4 \log_e(x-z)$
35. If $a_1, a_2, a_3, \ldots, a_n$ are in H.P. and , $f(k) = (\sum_{r=1}^{n} a_r) - a_k$ then $\frac{a_1}{f(1)}, \frac{a_2}{f(2)}, \frac{a_3}{f(3)}, \ldots \frac{a_n}{f(n)}$ are in
    (a) A.P. (b) G.P.
    (c) H.P. (d) none of these
36. The sums of n terms of two arithmetic progressions are in the ratio (5n+4) :(9n+6) find the ratio of their 18th terms.
    (a) 791/321 (b)127/321
    (c) 179/321 (d)12/321
37. If x, 2y, 3z are in A.P. where the distinct numbers x, y, z are in G.P., then find the common ratio of the G.P.
    (a) 1/3 (b) 2/3
    (c) 4/3 (d) 3/4
38. If S be the sum, P be the product and R be the sum of the reciprocals of 3 consecutive terms of a G.P., then find $P^2R^3 : S^3$.
    (a) 2:1 (b)1 :1
    (c)1:2 (d) 1:3
39. If $x = 1 + a + a^2 + \ldots$ to ∞, $y = 1 + b + b^2 + \ldots$ to , ∞, $z = 1 + c + c^2 + \ldots$ to ∞, where $|a| < 1$ '$|b| < 1$, $|c| < 1$ and a, b, c are in A.P., then show that 1/x, 1/y, 1/z are in .
    (a) AGP (b) GP
    (c) AP (d) HP
40. Find the sum of first n terms of the series 5+55 +555 +…
    (a) $\frac{5}{81}(10^{n+1}) - 10 - 9n$
    (b) $\frac{5}{81}(10^{n+1}) + 10 - 9n$
    (c) $\frac{5}{81}(10^{n+1}) - 10 + 9n$
    (d) $\frac{5}{81}(10^{n+1}) + 10 + 9n$
41. If f is a function satisfying $f(x + y) = f(x)\, f(y)$ for all $x, y \in N$ such that $f(1) = 3$ and $\sum_{x=1}^{n} f(x) = 120$ find the value of n.
42. 150 workers were engaged to finish a job in a certain number of days. 4 workers dropped out on second day, 4 more workers dropped out on the third day and so.on. It took 8 days more to finish the work. Find the number of days in which the work was completed.
43. The harmonic mean between two numbers is 21/5. Their arithmetic mean A and geometric mean G satisfy the relation $3A + G^2 = 36$ The sum of squares of numbers is
44. If $H_1\ H_2$, H_{20} be 20 harmonic means between 2 and 3, then $\frac{H_1+2}{H_1-2} + \frac{H_{20}+3}{H_{20}-3}$ equals
45. If b-c, bx-cy and bx^2-cy^2(b,c$\neq$ 0) are in G.P, then the value of $\frac{\left(\frac{bx+c}{b+c}\right)}{\left(\frac{bx-c}{b-c}\right)}$ *is*