



Class – XI (Going to XII) – Sample Paper
Duration : 2 hrs. | Maximum Marks : 180

IMPORTANT INSTRUCTIONS

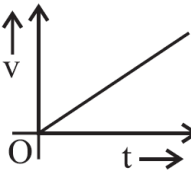
1. This Booklet is your Question Paper. DO NOT break seal of Booklet until the invigilator instructs to do so.
2. Fill your APRE Roll No. & Answer Sheet No. in the space provided on the cover page.
3. Please make sure that paper you received is of your class only.
4. The Answer Sheet is provided to you separately which is a machine-readable Optical Response Sheet (ORS).
You have to mark your answers in the ORS by darkening bubble, as per your answer choice, by using black or blue ball point pen.
5. After breaking the Question Paper seal, check there are 8 pages in the booklet. This Question Paper contains 60 MCQs with 4 choices (Subjects: Physics: 20, Chemistry: 20, Maths: 20)
6. Think wisely before darkening bubble as there is negative marking for wrong answer. Answer once marked by pen cannot be cancelled.
7. Marking Scheme:
 - a. If darkened bubble is RIGHT answer: 3 Marks.
 - b. If darkened bubble is WRONG answer: 1 Mark (Minus One Mark).
 - c. If no bubble is darkened in any question: No Mark.
8. If you are found involved in cheating or disturbing others, then your ORS will be cancelled.
9. Do not put any stain on ORS and hand. It over back properly to the invigilator.

Name of the Candidate: _____

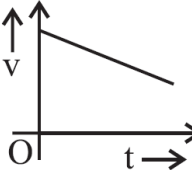
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PHYSICS

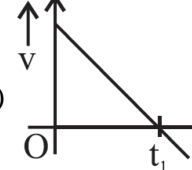
1. A man goes 40 m towards north, then 30 m towards east then his displacement is:
 (A) 37 m (B) **50 m** (C) 40 m (D) 38 m
2. An aeroplane flies 400 m north and 300 m south and then flies 1200 m upwards, then net displacement is:
 (A) **1200 m** (B) 1300 m (C) 1400 m (D) 1500 m
3. If the car goes from O to P and returns back to O, the displacement and path length of the journey can be:
 (A) **0, 720 m** (B) 720 m, 720 m (C) 0, 0 (D) 720 m, 0
4. The displacement of a particle is given by $x = (t - 2)^2$ where x is in metre and t in second. The distance covered by the particle in first 4 seconds is:
 (A) 4 m (B) **8 m** (C) 12 m (D) 16 m
5. A bullet emerges from a barrel of length 1.2 m with a speed of 600 ms^{-1} . Assuming constant acceleration the approximate time that it spends in the barrel after the bullet fired is:
 (A) 40 ms (B) **4 ms** (C) 4 second (D) 0.4 second
6. A particle having initial velocity 10 m/s moves with a constant acceleration 5 ms^{-2} , for a time 15 second along a straight line, what is the displacement of the particle in the last 2 second?
 (A) **160 m** (B) 200 m (C) 210 m (D) 230 m
7. An object is moving in negative direction with a negative acceleration. The velocity-time graph with constant acceleration which represents the above situation is:



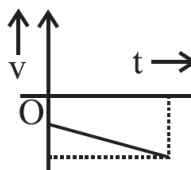
(A)



(B)

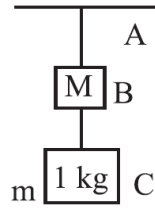


(C)

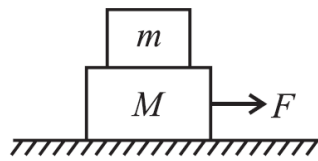


(D)
8. The vector projection of a vector $3\hat{i} + 5\hat{k}$ on y-axis is:
 (A) 5 (B) 4 (C) 3 (D) **Zero**
9. The maximum range of a gun on horizontal terrain is 9 km. If $g = 10 \text{ m/s}^2$. What must be the muzzle velocity of the shell?
 (A) **300 m/s** (B) 390 m/s (C) 380 m/s (D) 350 m/s
10. A bullet fired into a fixed block of wood loses half its velocity after penetrating 60 cm before coming to rest it penetrates a further distance of:
 (A) 60 cm (B) 30 cm (C) **20 cm** (D) 10 cm
11. The path of one projectile in motion as seen from another moving projectile is -
 (A) **A straight line** (B) A circle (C) An ellipse (D) A parabola
12. A man is sitting in a bus. He suddenly falls ahead when bus suddenly apply brakes because.
 (A) Man is taken back
 (B) Due to gravitation
 (C) **Inertia of rest keeps the lower part of the body at rest whereas the upper part of body in motion by inertia of motion**
 (D) None of the above

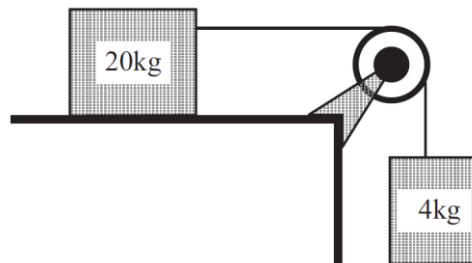
13. A mass of 1 kg is suspended by a string A. Another string C is connected to its lower end. If a sudden jerk is given to C then



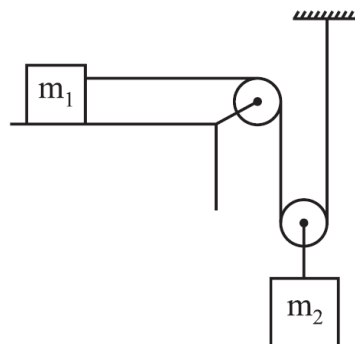
- (A) The portion of AB of the string will break
 (B) **The portion BC of the string will break**
 (C) None of the string will break
 (D) The mass will start rotating
14. The mass m is placed on a body of mass M . There is no friction. The force F is applied on M and it moves with acceleration a . Then the force on the top body is:



- (A) F (B) ma (C) $F - ma$ (D) **none of these**
15. A trolley of mass 20 kg is attached to a block of mass 4 kg by a massless string passing over a frictionless pulley as shown in the figure. If the coefficient of kinetic friction between trolley and the surface is 0.02, then the acceleration of the trolley and block system is: (Take $g = 10 \text{ ms}^{-2}$)

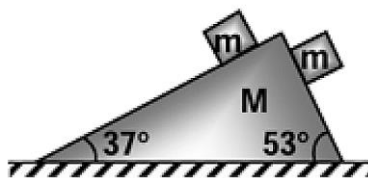


- (A) 1 m s^{-2} (B) 2 m s^{-2} (C) **1.5 m s^{-2}** (D) 2.5 m s^{-2}
16. The acceleration of m_1 and m_2 are a_1 and a_2 then



- (A) $a_1 = a_2$ (B) **$a_1 = 2 a_2$** (C) $2a_1 = a_2$ (D) $a_1 \leq a_2$
17. A man pushes a wall and fails to displace it. He does
- (A) Negative work (B) Positive but not maximum work
 (C) **No work at all** (D) Maximum work

18. A force of 10 N acts on a 10 kg body initially at rest. The work done by the force during the first 5 second and 5th second of motion of body is. (in joule)
 (A) 3, 1.5 (B) 9, 4 (C) 11.5, 5 (D) 125, 45
19. A right triangular wooden block of mass $M = 4$ kg is at rest on a smooth table as shown in the figure. Two smaller wooden cubes both of mass $m = 2$ kg, initially at rest on the two sides of the larger block start sliding down. What is the normal force (in newton) applied by the system on the table? (take $g = 9.8 \text{ m/s}^2$)



- (A) 58.8 N (B) 58 N (C) 60.6 N (D) 56.5 N
20. A force of 10 N acts on a body of 2 kg mass for a distance of 1 m. The kinetic energy received by the body is—
 (A) 20 J (B) 10 J (C) 5 J (D) 2.5 J

CHEMISTRY

21. The average molecular mass of a mixture of gas containing nitrogen and carbon dioxide is 36. The mixture contain 280 gm of nitrogen, therefore, the amount of CO_2 present in the mixture is -
 (A) 440 gm (B) 44 gm (C) 0.1mole (D) 880 gm
22. The number of molecules present in 88 g of CO_2 (Relative molecular mass of $\text{CO}_2 = 44$)
 (A) 1.24×10^{23} (B) 3.01×10^{23} (C) 6.023×10^{24} (D) 1.2046×10^{24}
23. What volume of 0.4-M $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ will contain 600 mg of Fe^{3+} ?
 (A) 49.85 mL (B) 26.78 mL (C) 147.55 mL (D) 87.65 mL
24. Equal volumes of 0.50 M of HCl, 0.25 M of NaOH and 0.75 M of NaCl are mixed. The molarity of the NaCl solution is -
 (A) 0.75 M (B) 1/3 M (C) 0.50 M (D) 2.00 M
25. Which of the following statements is wrong regarding ionic compounds -
 (A) These are generally in solid state at room temperature
 (B) The force of attraction between ions is non directional
 (C) Ionic compounds are soluble in all solvents
 (D) They conduct electricity in molten and solution state
26. π bond can be formed between -
 (A) C – C (B) O – O (C) N – N (D) All of these
27. Among LiCl, BeCl_2 , BCl_3 and CCl_4 , the covalent bond character follows the order -
 (A) $\text{LiCl} < \text{BeCl}_2 > \text{BCl}_3 > \text{CCl}_4$ (B) $\text{LiCl} > \text{BeCl}_2 < \text{BCl}_3 < \text{CCl}_4$
 (C) $\text{LiCl} < \text{BeCl}_2 < \text{BCl}_3 < \text{CCl}_4$ (D) $\text{LiCl} > \text{BeCl}_2 > \text{BCl}_3 > \text{CCl}_4$
28. Which of the following molecular orbital has two nodal planes -
 (A) σ_{2s} (B) $\pi^* 2p_y$ (C) σ_{2p_z} (D) $\sigma^* 2p_x$

29. Correct order of Bond energy in -
 (A) C–C > N–N > O–O > F–F (B) C–C < N–N < O–O < F–F
 (C) C–C > N–N > O–O < F–F (D) O–O > N–N > C–C > F–F
30. Calculate the wavelength of the spectral line when the electron in the hydrogen atom undergoes a transition from fourth energy level to second energy level?
 (A) 4.86 nm (B) 486 nm (C) 48.6 nm (D) 4860 nm
31. In two H atoms X and Y the electrons move around the nucleus in circular orbits of radius r and $4r$ respectively. The ratio of the times taken by them to complete one revolution is -
 (A) 1 : 4 (B) 1 : 2 (C) 1 : 8 (D) 2 : 1
32. A 200g cricket ball is thrown with a speed of $3.0 \times 10^3 \text{ cm sec}^{-1}$. What will be its de Broglie's wavelength? [$h = 6.6 \times 10^{-27} \text{ g cm}^2 \text{ sec}^{-1}$]
 (A) $1.1 \times 10^{-32} \text{ cm}$ (B) $2.2 \times 10^{-32} \text{ cm}$ (C) $0.55 \times 10^{-32} \text{ cm}$ (D) $11.0 \times 10^{-32} \text{ cm}$
33. If n and l are respectively the principal and azimuthal quantum numbers, then the expression for calculating the total number of electrons in any energy level is -
 (A) $\sum_{\ell=0}^{\ell=n} 2(2\ell+1)$ (B) $\sum_{\ell=1}^{\ell=n-1} 2(2\ell+1)$ (C) $\sum_{\ell=0}^{\ell=n+1} 2(2\ell+1)$ (D) $\sum_{\ell=0}^{\ell=n-1} 2(2\ell+1)$
34. The oxidation number of sulphur in S_8 , S_2F_2 and H_2S respectively are -
 (A) 0, +1 and -2 (B) +2, +1 and -2 (C) 0, +1 and +2 (D) -2, +1 and -2
35. When the ion $\text{Cr}_2\text{O}_7^{2-}$ acts as an oxidant in acidic aqueous solution the ion Cr^{3+} is formed. How many moles of Sn^{2+} would be oxidised to Sn^{4+} by one mole of $\text{Cr}_2\text{O}_7^{2-}$ ions -
 (A) 2/3 (B) 3/2 (C) 2 (D) 3
36. 0.05 moles of NaHCO_3 will react with how many equivalents of $\text{Mg}(\text{OH})_2$?
 (A) 0.2 equiv (B) 0.05 equiv (C) 0.02 equiv (D) 0.01 equiv
37. What will be the distance between A and B atom in AB? If radius of A is 0.37 \AA and the radius of B is 1.67 \AA - (According to the concept of co-valent radius and zero electronegativity difference between A and B)
 (A) 2.04 \AA (B) 1.96 \AA (C) 2.12 \AA (D) 1.0 \AA
38. Which of the following elements has the maximum electron affinity?
 (A) F (B) Cl (C) Br (D) I
39. Which of the following is the weakest basic oxide -
 (A) Fe_2O_3 (B) FeO (C) BaO (D) Na_2O
40. Which of the following involves the maximum amount of energy -
 (A) $\text{Mg}_{(\text{g})}^- \rightarrow \text{Mg}_{(\text{g})}$ (B) $\text{Mg}_{(\text{g})}^{2+} \rightarrow \text{Mg}_{(\text{g})}^{3+}$ (C) $\text{Mg}_{(\text{g})}^- \rightarrow \text{Mg}_{(\text{g})}^+$ (D) $\text{Mg}_{(\text{g})}^+ \rightarrow \text{Mg}_{(\text{g})}^{2+}$

MATHEMATICS

41. In a class of 55 students, the number of students studying different subjects are 23 in Mathematics, 24 in Physics, 19 in Chemistry, 12 in Mathematics and Physics, 9 in Mathematics and Chemistry, 7 in Physics and Chemistry and 4 in all the three subjects. The number of students who have taken exactly one subject is
 (A) 10 (B) 8 (C) 5 (D) 22
42. The value of $\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$ is
 (A) 1 (B) 0 (C) ∞ (D) $1/2$
43. The value of $\sin(\pi + \theta) \sin(\pi - \theta) \operatorname{cosec}^2 \theta$ is equal to
 (A) -1 (B) 0 (C) $\sin \theta$ (D) None of these
44. If $\tan 25^\circ = x$, then $\frac{\tan 155^\circ - \tan 115^\circ}{1 + \tan 155^\circ \tan 115^\circ}$ is equal to
 (A) $\frac{1-x^2}{2x}$ (B) $\frac{1+x^2}{2x}$ (C) $\frac{1+x^2}{1-x^2}$ (D) $\frac{1-x^2}{1+x^2}$
45. If $\tan \alpha + \cot \alpha = a$ then the value of $\tan^4 \alpha + \cot^4 \alpha =$
 (A) $a^4 + 4a^2 + 2$ (B) $a^4 - 4a^2 + 2$ (C) $a^4 - 4a^2 - 2$ (D) None of these
46. The point A divides the join of the points $(-5, 1)$ and $(3, 5)$ in the ratio $k : 1$ and coordinates of points B and C are $(1, 5)$ and $(7, -2)$ respectively. If the area of ΔABC be 2 units, then k equals
 (A) 7, 9 (B) 6, 7 (C) 7, 31/9 (D) 9, 31/9
47. A line is perpendicular to $3x + y = 3$ and passes through a point $(2, 2)$. Its y intercept is
 (A) $2/3$ (B) $1/3$ (C) 1 (D) $4/3$
48. The equation of the line whose slope is 3 and which cuts off an intercept 3 from the positive x -axis is
 (A) $y = 3x - 9$ (B) $y = 3x + 3$ (C) $y = 3x + 9$ (D) None of these
49. The third term of a G.P. is 4. The product of the first five terms is
 (A) 4^3 (B) 4^5 (C) 4^4 (D) None of these
50. If p is positive, then the sum to infinity of the series, $\frac{1}{1+p} - \frac{1-p}{(1+p)^2} + \frac{(1-p)^2}{(1+p)^3} - \dots$ is
 (A) $1/2$ (B) $3/4$ (C) 1 (D) None of these
51. Let T_r be the r^{th} term of an A.P. whose first term is a and common difference is d . If for some positive integers $m, n, m \neq n, T_m = \frac{1}{n}$ and $T_n = \frac{1}{m}$, then $a - d$ equals-
 (A) 0 (B) 1 (C) $1/mn$ (D) $\frac{1}{m} + \frac{1}{n}$
52. The equation of the line parallel to the line $2x - 3y = 18$ and passing through the middle point of the line segment joining the points $(1, 3)$ and $(1, -7)$, is
 (A) $2x - 3y + 8 = 0$ (B) $2x - 3y = 8$
 (C) $2x - 3y + 4 = 0$ (D) 0

53. The equation of a straight line passing through $(-22, -17)$ and cutting an intercept equal in magnitude but opposite in sign from the axes is given by
 (A) $x - y + 5 = 0$ (B) $x + y + 39 = 0$ (C) $x - y - 39 = 0$ (D) $x + y + 5 = 0$
54. If $A = \{2, 4, 5\}$, $B = \{7, 8, 9\}$, then $n(A \times B)$ is equal to
 (A) 6 (B) 9 (C) 3 (D) 0
55. If m^{th} terms of the series $63 + 65 + 67 + 69 + \dots$ and $3 + 10 + 17 + 24 + \dots$ be equal, then m is equal to
 (A) 11 (B) 12 (C) 13 (D) 15
56. If $aN = \{ax : x \in N\}$ and $bN \cap cN = dN$, where $b, c \in N$ are relatively prime, then
 (A) $d = bc$ (B) $c = bd$ (C) $b = cd$ (D) None of these
57. If $\sin \theta + \operatorname{cosec} \theta = 2$, then $\sin^2 \theta + \operatorname{cosec}^2 \theta =$
 (A) 1 (B) 4 (C) 3 (D) None of these
58. The points $\left(0, \frac{8}{3}\right)$, $(1, 3)$ and $(82, 30)$ are vertices of
 (A) an obtuse angled triangle (B) an acute angled triangle
 (C) a right angled triangle (D) none of these
59. Sum up to 16 terms of the series $\frac{1^3}{1} + \frac{1^3 + 2^3}{1+3} + \frac{1^3 + 2^3 + 3^3}{1+3+5} + \dots$ is
 (A) 450 (B) 456 (C) 446 (D) none of these
60. If a, b, c are in G.P., then the equations $ax^2 + 2bx + c = 0$ and $dx^2 + 2ex + f = 0$ have a common root if $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ are in -
 (A) A.P. (B) G.P. (C) H.P. (D) none of these

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