

WHIZ SEARCH (SAMPLE PAPER)

CLASS – 11th [ENGINEERING]

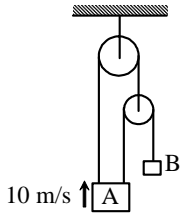
Important Instructions:

- This paper contains 35 questions among 4 Sections (Physics, Chemistry, Mathematics and Mental ability & Reasoning).
- All questions are compulsory.
- Sections (Physics, Chemistry and Mathematics) contains 9 questions each.
- Section (Mental ability & Reasoning) contains 8 questions only.
- Total Time duration of test paper is 60 Minutes only.
- Each question is allotted **4 marks for correct response**.
- **1 mark will be deducted** for marking incorrect or multiple responses.
- No deduction will be made from total marks for unattempted questions.
- For each question, there is **only 1 correct** response.

PHYSICS

SECTION (Maximum Marks: 36)

(1.) At a certain moment of time velocity of A is 10 m/s upward. The velocity of B at that time will be



- (a.) 30 m/s downward
- (b.) 20 m/s downward
- (c.) 10 m/s downward
- (d.) 5 m/s downward

ANS: A

(2.) A body has an initial velocity of 3 ms^{-1} and has an acceleration of 1 ms^{-2} normal to the direction of the initial velocity. Then its velocity, 4 second after the start is

- (a.) 7 ms^{-1} along the direction of initial velocity
- (b.) 7 ms^{-1} along the normal to the direction of the initial velocity
- (c.) 7 ms^{-1} mid-way between the two directions
- (d.) 5 ms^{-1} at an angle of $\tan^{-1} \frac{4}{3}$ with the direction of the initial velocity

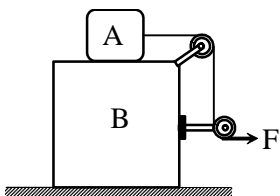
ANS: D

(3.) A particle moves one quarter of a circular path of radius 20 m in 10 s. The magnitude of average velocity of the particle is

- (a.) 2.83 m/s
- (b.) 2.73 m/s
- (c.) 2.93 m/s
- (d.) 2.63 m/s

ANS: A

(4.) In the arrangement shown in figure $m_A = m_B = 2\text{kg}$. String is massless and pulley is frictionless. Block B is resting on a smooth horizontal surface, while friction coefficient between blocks A and B is $\mu = 0.5$. The maximum horizontal force F can be applied so that block A does not slip over the block B is. ($g = 10 \text{ m/s}^2$)



- (a.) 25 N

- (b.) 40 N
- (c.) 30 N
- (d.) 20 N

ANS: D

(5.) Work done in time t on a body of mass m accelerated from rest to a speed v in time t_1 as function of time t is

- (a.) $\frac{1}{2} \frac{mvt^2}{t_1}$
- (b.) $\frac{mvt^2}{t_1}$
- (c.) $\frac{1}{2} \left(\frac{mv}{t_1} \right)^2 t^2$
- (d.) $\frac{1}{2} m \left(\frac{vt}{t_1} \right)^2$

ANS: D

(6.) Two particles having position vectors $\vec{r}_1 = (3\hat{i} + 5\hat{j})$ metres and $\vec{r}_2 = (-5\hat{i} - 3\hat{j})$ metres are moving with velocities $\vec{v}_1 = (4\hat{i} + 3\hat{j})$ and $\vec{v}_2 = (a\hat{i} + 7\hat{j})$ m/s. If they collide after 2 seconds, the value of a is

- (a.) 2
- (b.) 4
- (c.) 6
- (d.) 8

ANS: D

(7.) Under a constant torque, the angular momentum of a body changes from A to $4A$ in 4 seconds, the torque is

- (a.) $\left(\frac{3}{4} \right) A$
- (b.) $\left(\frac{1}{4} \right) A$
- (c.) $3A$
- (d.) $\left(\frac{4}{3} \right) A$

ANS: A

(8.) If the value of escape velocity on a planet is $2\sqrt{\frac{GM}{K}}$ the radius of the planet will be

- (a.) $0.5 K$
- (b.) K
- (c.) $2K$
- (d.) $5K$

ANS: A

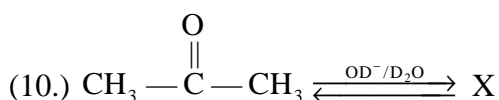
(9.) An elongation of 0.1% in a wire of cross-sectional area 10^{-6} m^2 causes a tension of 100 N. The Young's modulus is

- (a.) 10^{12} N/m^2
- (b.) 10^{11} N/m^2
- (c.) 10^{10} N/m^2
- (d.) 10^2 N/m^2

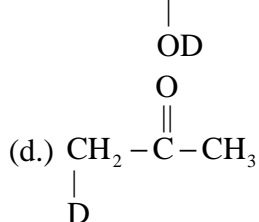
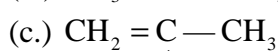
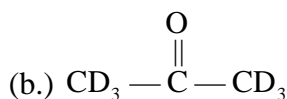
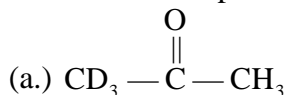
ANS: B

CHEMISTRY

SECTION (Maximum Marks: 36)



The compound X will be :



ANS: B

(11.) In the given reversible reaction $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$ According to Le-chatitier's principle if we increase the pressure of the reversible system then :-

- (a.) Concentration of all will increase
- (b.) Concentration of all will decrease
- (c.) Concentration of PCl_3 will decrease
- (d.) Concentration of PCl_5 will decrease

ANS: A

(12.) The oxidation number of sulphur(s) in $\text{Na}_2\text{S}_2\text{O}_3$ is :

- (a.) 2
- (b.) 0, + 4
- (c.) -2, + 6
- (d.) 3, 3

ANS: C

(13.) One gm of dry green algae absorbs 4.7×10^{-3} moles of CO_2 per hour by photosynthesis if the fixed carbon atoms after photosynthesis stored in the form of starch [Mole formula $(\text{C}_6\text{H}_{10}\text{O}_5)_n$]. Calculate how much time will it take to algae to double its own weight.

- (a.) 2.2 hour
- (b.) 8.8 hour
- (c.) 10.0 hour
- (d.) 1.2 hour

ANS: B

(14.) In nature of π -bond in the compound XeOF_4 is

- (a.) $3d_{\pi} - 2p_{\pi}$
- (b.) $5d_{\pi} - 2p_{\pi}$
- (c.) $4d_{\pi} - 2p_{\pi}$
- (d.) $4d_{\pi} - 3p_{\pi}$

ANS: C

(15.) 10 mL of gaseous organic compound contain C, H and O only was mixed with 100 mL of O_2 and exploded under identical conditions and then cooled. The volume left after cooling was 90 mL. On treatment with KOH a contraction of 20 mL was observed. If vapour density of compound is 23, if molecular formula of the compound is $\text{C}_x\text{H}_y\text{O}_z$, then find $(x + y + z)$.

- (a.) 8
- (b.) 9
- (c.) 6
- (d.) 11

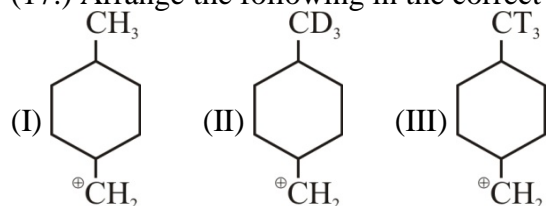
ANS: B

(16.) According to Bohr's model of hydrogen atom the electric current generated due to motion of electron in n^{th} orbit is :

- (a.) $\frac{4\pi^2mk^2e^4}{n^2h^2}$
- (b.) $\frac{4\pi^2mk^2e^5}{n^2h^2}$
- (c.) $\frac{n^2h^2}{4\pi^2mk^2e^5}$
- (d.) $\frac{4\pi^2mk^2e^5}{n^3h^3}$

ANS: D

(17.) Arrange the following in the correct order of their stability.



- (a.) I = II = III
- (b.) III > II > I
- (c.) I > II > III
- (d.) I > III > II

ANS: B

(18.) The correct order of solubility of sulphates of alkaline earth metals are

- (a.) $\text{BeSO}_4 > \text{MgSO}_4 > \text{SrSO}_4 > \text{CaSO}_4$
- (b.) $\text{BeSO}_4 > \text{MgSO}_4 > \text{CaSO}_4 > \text{SrSO}_4$
- (c.) $\text{BeSO}_4 > \text{MgSO}_4 < \text{CaSO}_4 < \text{SrSO}_4$
- (d.) $\text{MgSO}_4 < \text{CaSO}_4 < \text{SrSO}_4 > \text{BeSO}_4$

ANS: B

MATHEMATICS

SECTION (Maximum Marks: 36)

(19.) Numbers greater than 1000 but not greater than 4000 which can be formed with the digits 0, 1, 2, 3, 4 (repetition of digits is allowed), are

- (a.) 350
- (b.) 375
- (c.) 450
- (d.) 576

ANS: B

(20.) If the arithmetic and geometric means of a and b be A and G respectively, then the value of $A - G$ will be

- (a.) $\frac{a-b}{a}$
- (b.) $\frac{a+b}{2}$
- (c.) $\left[\frac{\sqrt{a} - \sqrt{b}}{\sqrt{2}} \right]^2$
- (d.) $\frac{2ab}{a+b}$

ANS: C

(21.) Let α, β be the roots of $x^2 + (3 - \lambda)x - \lambda = 0$. The value of λ for which $\alpha^2 + \beta^2$ is minimum, is

- (a.) 0
- (b.) 1
- (c.) 2
- (d.) 3

ANS: C

(22.) The number of integral terms in the expansion of $(5^{1/2} + 7^{1/6})^{642}$ is

- (a.) 106
- (b.) 108
- (c.) 103
- (d.) 109

ANS: B

(23.) If $\sin \theta + \sin \phi = a$ and $\cos \theta + \cos \phi = b$, then $\tan \frac{\theta - \phi}{2}$ is equal to

- (a.) $\sqrt{\frac{a^2 + b^2}{4 - a^2 - b^2}}$
- (b.) $\sqrt{\frac{4 - a^2 - b^2}{a^2 + b^2}}$
- (c.) $\sqrt{\frac{a^2 + b^2}{4 + a^2 + b^2}}$
- (d.) $\sqrt{\frac{4 + a^2 + b^2}{a^2 + b^2}}$

ANS: B

(24.) The equation of the base of an equilateral triangle is $x + y = 2$ and the vertex is $(2, -1)$. The length of the side of the triangle is

- (a.) $\sqrt{3/2}$
- (b.) $\sqrt{2}$
- (c.) $\sqrt{2/3}$
- (d.) $\sqrt{3}$

ANS: C

(25.) If the line $x + 2by + 7 = 0$ is a diameter of the circle $x^2 + y^2 - 6x + 2y = 0$, then b is equal to

- (a.) 3
- (b.) -5
- (c.) -1
- (d.) 5

ANS: D

(26.) The latus rectum of a parabola whose directrix is $x + y - 2 = 0$ and focus is $(3, -4)$, is

- (a.) $-3\sqrt{2}$
- (b.) $3\sqrt{2}$
- (c.) $-3/\sqrt{2}$
- (d.) $3/\sqrt{2}$

ANS: B

(27.) If the eccentricities of the hyperbolas $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ and $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ be e and e_1 , then $\frac{1}{e^2} + \frac{1}{e_1^2} =$

- (a.) 1
- (b.) 2
- (c.) 3
- (d.) 4

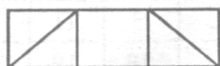
ANS: A

EXP:

MENTAL ABILITY & REASONING

SECTION 1 (Maximum Marks: 32)

(28.) How many quadrilaterals are there in the following figure?



- (a.) 11
- (b.) 8
- (c.) 2
- (d.) 4

ANS: A

(29.) Find the wrong term 9, 11, 15, 23, 39, 70, 135

- (a.) 23
- (b.) 39
- (c.) 70
- (d.) 135

ANS: C

(30.) A watch reads 4 : 30. If the minute - hand points to East, in which direction does the hour-hand point ?

- (a.) North-East
- (b.) South-East
- (c.) North-West
- (d.) North

ANS: A

(31.) The time in the clock is 4 : 46, what is the mirror image ?

- (a.) 7 : 24
- (b.) 7 : 14
- (c.) 7 : 14
- (d.) 7 : 24

ANS: B

(32.) Neelam, who is Rohit's daughter, says to Indu, "Your mother Reeta is the younger sister of my father, who is the third child of Sohanji. " How is Sohanji related to Indu ?

- (a.) Maternal-uncle
- (b.) Grandfather
- (c.) Father
- (d.) Father-in-law

ANS: B

(33.) If the seventh day of month is three days earlier than Friday, what day will it be one the nineteenth day of the month ?

- (a.) Sunday
- (b.) Monday
- (c.) Wednesday
- (d.) Friday

ANS: A

(34.) Sum of the Proper divisors of 100.

- (a.) 217
- (b.) 216
- (c.) 116
- (d.) 117

ANS: B

(35.) Sanjay went 70 metres in the East before turning to his right. He went 10 metres before turning to his right again and went 10 metres from this point. From here he went 90 metres to the North. How far was he from the starting point?

- (a.) 80 metres
- (b.) 100 metres
- (c.) 140 metres
- (d.) 260 metres

ANS: B