

FIITJEE Talent Reward Exam

for student presently in

Class 10

PAPER-1

Time: 3 Hours

Maximum Marks: 214

Instructions:

Caution: Question Paper CODE as given above **MUST** be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.

1. This Question Paper Consists of 7 Comprehension Passages based on Physics, Chemistry and Mathematics which has total **29 objective type questions**.
2. All the Questions are Multiple Choice Questions having only **one correct answer**. Each question from **Q. 1 to 9** carries **+6 marks** for correct answer and **-2 marks** for wrong answer. Each question from **Q. 10 to 29** carries **+8 marks** for correct answer and **-3 marks** for wrong answer.
3. Answers have to be marked on the OMR sheet.
4. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.
5. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.
6. **Before attempting paper write your Name, Registration number and Test Centre** in the space provided at the bottom of this sheet.

Note:

Check all the sheets of this question paper. Please ensure the same SET is marked on header of all the sheets inside as indicated above 'Maximum Marks' of this page. In case SET marked is not the same on all pages, immediately inform the invigilator and **CHANGE** the Questions paper.

Registration Number :

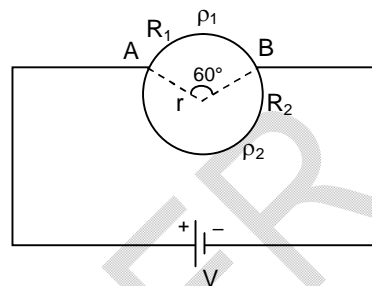
Name of the Candidate :

Test Centre :

SECTION – I (COMPREHENSION TYPE)

Passage - 1 (For questions no. 1 - 3)

Following is the given circuit. Which contains two resistance R_1 and R_2 in form of circle of radius $r = 1$ m with a battery having e.m.f. $V = 10\pi$ volt. Upper resistance is having resistivity $\rho_1 = 4\Omega\text{m}$ & lower resistance having resistivity $\rho_2 = 2\Omega\text{m}$. Angle between two points A and B is 60° . (wires have same cross section $A_1 = A_2 = 2\text{ cm}^2$)



1. What is value of $R_1 : R_2$
 (A) 1 : 1 (B) 2 : 5
 (C) 6 : 7 (D) 7 : 6
2. Find magnitude of magnetic field at centre.
 (A) 0T (B) 1T
 (C) 2T (D) π T
3. Calculate the net current flowing through the circuit
 (A) 42×10^{-2} A (B) 21×10^{-2} A
 (C) 21×10^{-4} A (D) 42×10^{-4} A

Passage - 2 (For questions no. 4 - 6)

Thermal decomposition reaction of oxygen containing salts produce acidic and basic oxides.

Salt (A) on heating produces a solid (B) and gas (C) which produces white precipitate with lime water. Reaction of (B) with water forms milk of magnesia $\text{Mg}(\text{OH})_2$. Neutralization reaction of $\text{Mg}(\text{OH})_2$ with (D) produces compound (E) which is crystallized from the reaction mixture as $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$

4. Which of the following is compound (A)?
 (A) MgSO_4 (B) MgCO_3
 (C) $\text{Mg}(\text{NO}_3)_2$ (D) $\text{Mg}(\text{HCO}_3)_2$

Space For Rough Work

5. Which of the following is (D)?
(A) Cl_2 (B) HCl
(C) NaCl (D) CaCl_2
6. Which of the following acid is formed if (C) reacts with H_2O ?
(A) $\text{H}_2\text{C}_2\text{O}_4$ (B) $\text{H}_4\text{C}_2\text{O}_2$
(C) H_2CO_3 (D) H_2CO_2

Passage - 3
(For questions no. 7 - 9)

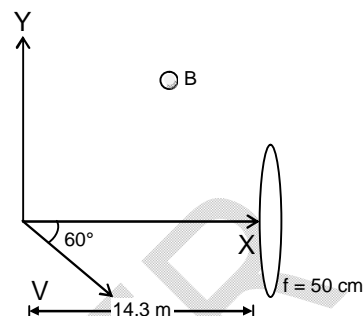
Let $f(x)$ be a polynomial of degree greater than one. If $f(x)$ is divided by $x - a$ then $f(a)$ is remainder.

7. Let $f(x) = x^{2013} + 1$ then the remainder when $f(x)$ is divided by $x^2 - 1$ is
(A) $x - 1$ (B) $x + 1$
(C) 0 (D) 1
8. If $f(x) = x^3 + px + q$ is divisible by $x^2 - x - 2$ then $p \cdot q =$
(A) 2 (B) 4
(C) 6 (D) 8
9. $f(x)$ be a polynomial such that $f(a) = f(b) = f(c) = f(d) = 3$. Where a, b, c, d are distinct integers. If $f(e) = 5$, where e is an integer then $e =$
(A) 1 (B) 3
(C) 4 (D) no real value of e is possible

Space For Rough Work

Passage - 4
(For questions no. 10 - 14)

A negatively charged particle having magnitude of charge $q = 0.1 \text{ C}$ and mass $m = 200 \text{ gm}$ moves with speed $v = 10 \text{ m/s}$ enters a region having magnetic field $B = 4 \text{ T}$ making an angle 60° with X axis as shown in figure. The direction of magnetic field is out of the X-Y plane. A convex lens is placed at a distance 14.3 m from origin. Region of magnetic field starts from origin and extends till lens. Focal length of lens is 50 cm . Take X-axis as principle axis.

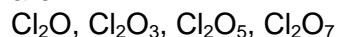


10. Calculate the radius of path of charge
 (A) 4.25 m (B) 6 m
 (C) 5 m (D) 7.1 m
11. Find the frequency of revolution
 (A) 0.32 Hz (B) 0.64 Hz
 (C) 2.16 Hz (D) 3.14 Hz
12. What is change in momentum from $t = 0$ to $t = \frac{\pi}{6} \text{ sec}$?
 (A) 8 kg m/s (B) 2 kg m/s
 (C) 10 kg m/s (D) 17.32 kg m/s
13. What is the image height at $t = \frac{\pi}{6} \text{ sec}$ from principle axis
 (A) 7.5 cm (B) 13 cm
 (C) 4.5 cm (D) 9 cm
14. Find the minimum value of initial velocity of charge so that image formed is virtual.
 (A) 7.2 m/s (B) 14.8 m/s
 (C) 16.4 m/s (D) 20 m/s

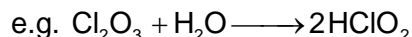
Space For Rough Work

Passage – 5
(For questions no. 15 - 19)

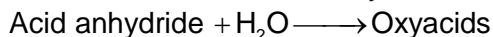
Chlorine forms a number of oxides by using different valencies like 1, 3, 5 and 7. The oxides are:



The oxides form very strong oxyacids when react with water. One molecule of each oxide reacts with water to form two molecules of corresponding acid.

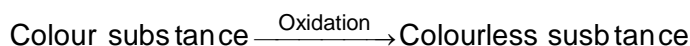


The oxides are also called acid anhydrides because they form acids when react with water.



The acidic strength of the oxides is directly proportional to the valency of chlorine.

Oxy-acid HClO behaves as a bleaching agent. It bleaches colouring matter to colourless matter by oxidation reaction.



Answer the following questions on the basis of above write-up

15. Which of the following oxy-acid is formed if Cl_2O_7 reacts with water?
 (A) HClO_3 (B) HClO_4
 (C) HClO_2 (D) HClO_7
16. Which of the following acid is not formed by the reaction of any of the given oxides of chlorine with water?
 (A) HClO (B) HClO_2
 (C) HClO_3 (D) HClO_5
17. Which reaction of HClO explains its bleaching action?
 (A) $\text{HClO} \xrightarrow{\text{H}_2\text{O}} \text{H}^+ + \text{ClO}^-$ (B) $\text{HClO} \longrightarrow \text{Cl}^+ + \text{OH}^-$
 (C) $\text{HClO} \longrightarrow \text{HCl} + \text{O}$ (D) All are correct
18. Which is the anhydride of HClO_3 ?
 (A) Cl_2O (B) Cl_2O_3
 (C) Cl_2O_5 (D) Cl_2O_7

Space For Rough Work

19. Which of the following change takes place if a litmus paper is dipped in HClO solution?
- (A) blue litmus turns red
(B) red litmus turns blue
(C) both type (blue and red) litmus undergo decolourization
(D) None of these

Passage - 6
(For questions no. 20 - 24)

$|x|$ is known as absolute value of x and defined as

$$|x| = x, \quad x > 0$$

$$= 0, \quad x = 0$$

$$= -x, \quad x < 0$$

$|a| + |b| = |a + b|$ if $a \cdot b \geq 0$ where a and b are two real numbers.

20. Sum of all values of x which satisfy $||x + 3| - 3| = 2$
- (A) 16 (B) -12
(C) 12 (D) -16
21. The number of real solutions of $x^2 - 1 = |x|$ is
- (A) 0 (B) 1
(C) 2 (D) 4
22. a and b are non – zero rational numbers, then the number of possible values of $\frac{a}{|a|} + \frac{b}{|b|}$ is
- (A) 4 (B) 2
(C) 1 (D) 3

Space For Rough Work

23. $\left| \frac{x}{x-1} \right| + |x| = \frac{x^2}{|x-1|}$ has
 (I) exactly one solution (II) exactly two solutions
 (A) only I is correct (B) exactly II is correct
 (C) Both I and II are incorrect (D) Both I and II correct
24. Given a quadratic polynomial $ax^2 + bx + c$, where a, b, c are real numbers has two real roots α and β such that $\alpha < -1$ and $\beta > 1$ then
 (A) $1 + \left| \frac{b}{a} \right| + \frac{c}{a} < 0$ (B) $1 + \left| \frac{c}{a} \right| + \frac{b}{a} < 0$
 (C) $1 + \left| \frac{c}{a} \right| + \left| \frac{b}{a} \right| < 0$ (D) none of these

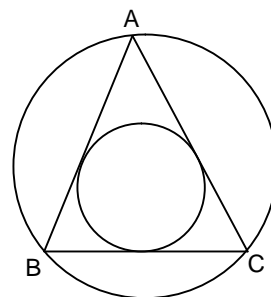
PASSAGE – 7
(For questions no. 25 - 29)

Let ABC be a triangle, $AB = c$, $BC = a$, $AC = b$ then

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R \text{ where, } R \text{ is circum radius of } \triangle ABC.$$

$$\text{In-radius (r) of } \triangle ABC = \frac{\text{Area of } \triangle ABC}{\text{Semiperimeter of } \triangle ABC}$$

$$\sin(180^\circ - A) = \sin A$$



25. In a right angled isosceles triangle, the ratio $\frac{R}{r} =$
 (A) $2(\sqrt{2} + 1) : 1$ (B) $(\sqrt{2} + 1) : 1$
 (C) $2 : 1$ (D) $\sqrt{2} : 1$

Space For Rough Work

26. If the angles of a triangle are in the ratio 4 : 1 : 1 and length of largest side is 6 cm then its circum – radius $R =$
(A) $4\sqrt{3}$ cm (B) $2\sqrt{3}$ cm
(C) $\sqrt{3}$ cm (D) 2 cm
27. ABC is an acute angled Δ whose circum – radius is 4 unit. H is the orthocenter of Δ then circum radius of HBC is
(A) 1 (B) 2
(C) 3 (D) 4
28. In a ΔABC , if $r = 1$, $R = 3$ and $S = 5$ then $\frac{a^2 + b^2 + c^2}{12} =$
(A) 1 (B) 2
(C) 3 (D) 8
29. In a ΔABC , $a = 5$, $b = 4$, $c = 3$. G is the centroid of the triangle. Circum radius of ΔGAB is
(A) $2\sqrt{13}$ (B) $\frac{5}{12}\sqrt{13}$
(C) $\frac{5}{3}\sqrt{13}$ (D) $\frac{3}{2}\sqrt{13}$

FIITJEE Talent Reward Exam

Class 10 PAPER-1 ANSWERS

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|-------|-------|-------|-------|
| 1. B | 2. A | 3. C | 4. B |
| 5. B | 6. C | 7. B | 8. C |
| 9. D | 10. C | 11. A | 12. B |
| 13. B | 14. B | 15. B | 16. D |
| 17. C | 18. C | 19. C | 20. B |
| 21. C | 22. D | 23. C | 24. A |
| 25. B | 26. B | 27. D | 28. B |
| 29. B | | | |