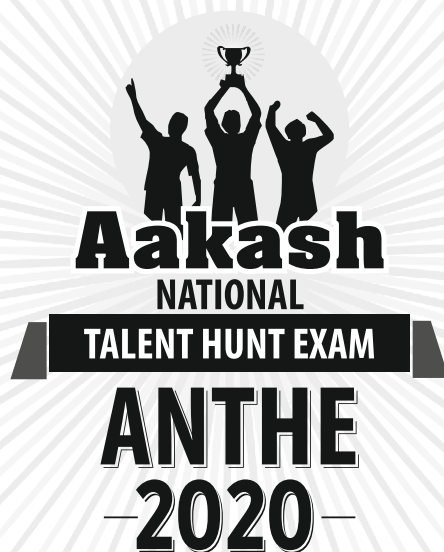


Sample Paper



(Class X Studying Moving to Class XI)

Physics, Chemistry, Mathematics & Mental Ability

INSTRUCTIONS FOR CANDIDATE

1. Duration of Test is 1 hr.
2. The Test booklet consists of **35** questions. The maximum marks are **90**. There is **no negative marking** for wrong answer.
3. Pattern of the questions are as under:
 - (i) This question paper consists of four parts i.e., Physics, Chemistry, Mathematics and Mental Ability. Physics, Chemistry, Mathematics have **four sections** and Mental Ability has **two sections**.
 - (ii) **Section-I:** This section contains **22** multiple choice questions, which have **only one** correct answer. Each question carries **+2 marks** for correct answer.
 - (iii) **Section-II:** This section contains **7** multiple choice questions, in which **more than one** answer may be correct. Each question carries **+4 marks** for correct answer.
 - (iv) **Section-III:** This section contains **3** multiple choice questions based on assertion-reason type, which have **only one** correct answer. Each question carries **+2 marks** for correct answer.
 - (v) **Section-IV:** This section contains **3** questions. Each question has two matching Columns. Column-I has four entries (A, B, C, D) and Column-II has four entries (P, Q, R, S). Each entry in Column-I may match with one or more entries in Column-II. Each question carries **+4 marks** for correct answer.



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Medical | IIT-JEE | Foundations

(Divisions of Aakash Educational Services Limited)

Aakash National Talent Hunt Exam 2020
Sample paper
(Class X Studying Moving to Class XI)

(The questions given in sample paper are indicative of the level and pattern of questions that will be asked in ANTHE-2020)

Time : 1 Hour

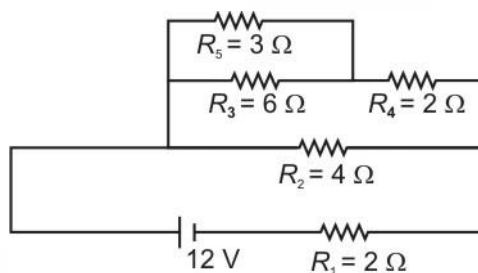
MM : 90

PHYSICS

SECTION-I : SINGLE ANSWER TYPE

This section contains 5 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct

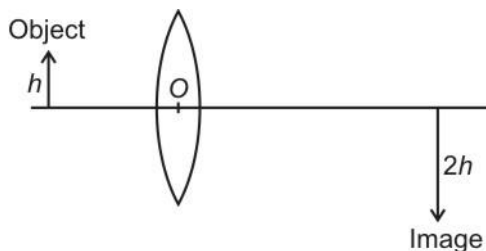
1. The power dissipated across resistor R_5 in the network given below is



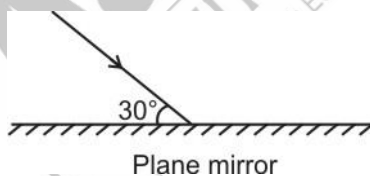
- (1) 3 watt
(2) $\frac{3}{4}$ watt
(3) $\frac{27}{4}$ watt
(4) 9 watt
2. At a particular temperature, which of the followings has maximum resistivity?
- (1) Conductors (2) Alloys
(3) Insulators (4) Semiconductors

Space for Rough Work

3. In the given figure, the position of the object is (symbols have their usual meanings)



- (1) Beyond $2F$ (2) Between F and $2F$
 (3) Between O and F (4) At F
4. If in a Cartesian plane, a convex lens is placed at the origin and a light source is placed at a point $\left(-\frac{f}{3}, 0\right)$, where f is the focal length of the lens, then
- (1) Virtual image of magnification $\frac{3}{2}$ will be formed at $\left(-\frac{f}{2}, 0\right)$
 (2) Virtual image of magnification $\frac{4}{3}$ will be formed at $\left(-\frac{f}{2}, 0\right)$
 (3) Real image of magnification $\frac{3}{4}$ will be formed at $\left(\frac{f}{2}, 0\right)$
 (4) Virtual image of magnification $\frac{3}{2}$ will be formed at $\left(\frac{f}{2}, 0\right)$
5. A ray of light incident on a plane mirror at an angle of 30° with the mirror. The angle between incident ray and reflected ray is



- (1) 60° (2) 120°
 (3) 90° (4) 150°

Space for Rough Work

SECTION-II : MORE THAN ONE ANSWER TYPE

This section contains 2 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **MORE THAN ONE** answer may be correct.

6. The dispersion of white light in a medium implies that
- (1) Light of different wavelengths have different speeds
 - (2) The red light bends the least while the violet the most
 - (3) The refractive indices are different for different wavelengths
 - (4) The violet light bends the least while the red the most
7. For a real object, placed in front of a spherical mirror, an image of magnitude of magnification 2 is formed. The nature of the mirror and the position of the object respectively are (symbols have their usual meanings)
- (1) Converging, between F and C
 - (2) Converging, beyond C
 - (3) Converging, between F and P
 - (4) Diverging, between F and C

SECTION-III : ASSERTION & REASON TYPE

This section contains 1 Assertion-Reason type question, which has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

8. **A** : -1 C is equivalent to charge contained in 6.25×10^{18} electrons.

$$\text{R : } n = \frac{Q}{e} = \frac{-1}{-1.6 \times 10^{-19}} = 6.25 \times 10^{18}$$

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is true but (R) is false
- (4) (A) is false but (R) is true

Space for Rough Work



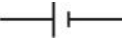

SECTION-IV : MATRIX MATCH TYPE

This section contains 1 Matrix Match type question, which has 2 Columns (Column I and Column II). Column I has four entries (A), (B), (C) and (D), Column II has four entries (P), (Q), (R) and (S). Match the entries in Column I with the entries in Column II. Each entry in Column I may match with one or more entries in Column II.

For each entry in Column I, tick the boxes of all the matching entries in Column II. For example, if entry (A) in Column I matches with entries (P) & (S) in Column II, then tick the boxes (P) & (S). Similarly, tick the boxes for entries (B), (C) and (D).

	P	Q	R	S
A.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Column-I contains elements of electric circuit and column-II contains symbols of circuit elements.

Column I	Column II
(A) Battery	(P) 
(B) Voltmeter	(Q) 
(C) Ammeter	(R) 
(D) Elements of circuit which provide electrical energy to the circuit	(S) 

Space for Rough Work

CHEMISTRY

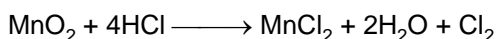
SECTION-I : SINGLE ANSWER TYPE

This section contains 5 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

10. Burning of coal is an example of

- | | |
|----------------------------|----------------------------------|
| (1) Decomposition reaction | (2) Combination reaction |
| (3) Displacement reaction | (4) Double displacement reaction |

11. Consider the given chemical reaction



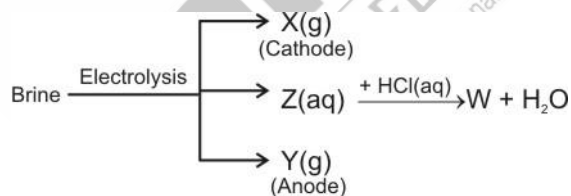
The substances getting reduced and oxidised respectively in the above chemical reaction are

- | | |
|--------------------------------------|-------------------------------------|
| (1) Cl_2 and MnO_2 | (2) MnO_2 and HCl |
| (3) MnO_2 and Cl_2 | (4) HCl and MnO_2 |

12. Which of the following substances cannot be used to neutralise an acid extract?

- (1) Suspension of milk of Magnesia
- (2) Baking powder solution
- (3) Dock leaf extract
- (4) Nettle leaf extract

13. Consider the following flow chart and the statements given below

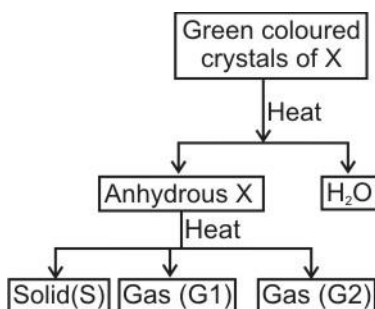


Now, choose the correct statement

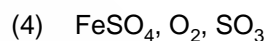
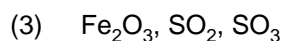
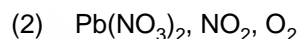
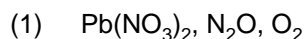
- | | |
|-----------------------------|-----------------------|
| (1) W is an acidic compound | (2) X is chlorine gas |
| (3) Z is basic in nature | (4) pH of Z < 7 |

Space for Rough Work

14. Consider the following flow chart,



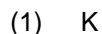
S, G1 and G2 respectively can be



SECTION-II : MORE THAN ONE ANSWER TYPE

This section contains 2 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **MORE THAN ONE** answer may be correct.

15. Which of the following elements will produce metal hydroxide on reaction with water?



16. Consider the following elements and their electronic configuration

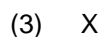
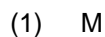
M = 2, 8, 8, 2

N = 2, 6

X = 2, 8, 7

Y = 2, 8, 5

The non-metallic element(s) is/are



Space for Rough Work

SECTION-III : ASSERTION & REASON TYPE

This section contains 1 Assertion-Reason type question, which has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

17. **A** : Ionic compounds conduct electricity in their molten state only.

R : Ionic compounds have electrostatic force of attraction which become weak when compound is heated.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is true but (R) is false
- (4) (A) is false but (R) is true

SECTION-IV : MATRIX MATCH TYPE

This section contains 1 Matrix Match type question, which has 2 Columns (Column I and Column II). Column I has four entries (A), (B), (C) and (D), Column II has four entries (P), (Q), (R) and (S). Match the entries in Column I with the entries in Column II. Each entry in Column I may match with one or more entries in Column II.

For each entry in Column I, tick the boxes of all the matching entries in Column II. For example, if entry (A) in Column I matches with entries (P) & (S) in Column II, then tick the boxes (P) & (S). Similarly, tick the boxes for entries (B), (C) and (D).

	P	Q	R	S
A.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Match the columns

Column I	Column II
(A) Aqueous solution of CO_2	(P) Turns phenolphthalein pink
(B) 10 mL water + 20 mL milk of Magnesia	(Q) pH is more than 7
(C) Lime water	(R) Turns red litmus blue
(D) Aqueous solution of sodium oxide	(S) Turns blue litmus red

Space for Rough Work

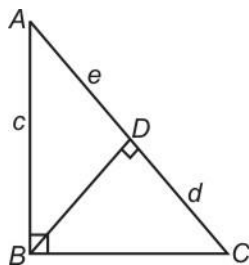
MATHEMATICS**SECTION-I : SINGLE ANSWER TYPE**

This section contains 6 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

19. In a building, there is a window situated at mid-point of height of the building. If there is a point in the ground whose distance is $\frac{\sqrt{3}}{2}$ times the height of the building, then the angle of elevation of the window from the same point is
- (1) 30° (2) 45°
(3) 60° (4) 75°
20. $\triangle ABC$ is formed by joining the mid-points of the sides of $\triangle PQR$. Another triangle DEF is formed by joining the mid-points of $\triangle ABC$. If coordinates of D , E and F are $(4, 5)$, $(-1, 2)$ and $(-1, -4)$ respectively, then coordinates of centroid of $\triangle PQR$ is
- (1) $\left(\frac{1}{3}, \frac{1}{2}\right)$ (2) $\left(\frac{1}{6}, \frac{-1}{3}\right)$
(3) $\left(\frac{-2}{3}, \frac{-1}{2}\right)$ (4) $\left(\frac{2}{3}, 1\right)$
21. Consider the following two statements :
- Statement I :** $\tan^2\theta - \sin^2\theta = \tan^2\theta\sin^2\theta$
Statement II : $\sec^2\theta + \operatorname{cosec}^2\theta = \sec^2\theta\operatorname{cosec}^2\theta$
- The statement(s) which is/are always true for all acute angles ' θ ' is
- (1) I only (2) Both I and II
(3) II only (4) Neither I nor II
22. Ram, Shyam and Ruchi start their journey around a circular track of radius 70 meters. If their speeds are 11 m/min, 44 m/min and 22 m/min respectively, then how many times they will meet together at starting point in 440 minutes after the start of their journey?
- (1) 10 (2) 9
(3) 12 (4) 11
23. An A.P. consists of 43 terms, if the sum of five middle-most terms is 195, then the sum of the A.P. is
- (1) 1793 (2) 1677
(3) 1501 (4) 1479

Space for Rough Work

24. In the given figure, the value of $e^2 + ed$ is



(1) $\frac{c^2}{2}$

(2) c^2

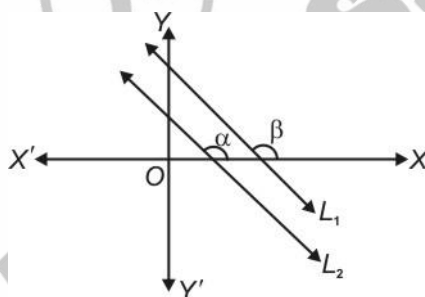
(3) $2c$

(4) c

SECTION-II : MORE THAN ONE ANSWER TYPE

This section contains 2 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **MORE THAN ONE** answer may be correct.

25. Consider a pair of straight lines L_1 and L_2 whose graphical representation is shown in the given figure. If $\alpha = \beta$, then which of the following system of equations represents the given pair of straight lines?



(1) $2x + 4y = 6,$
 $8y + 4x = 9$

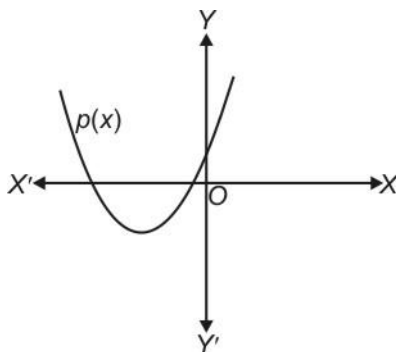
(2) $x + 2y = 3,$
 $6y + 3x = 8$

(3) $x + y = 1,$
 $5x + 2y = 10$

(4) $x + y = 2,$
 $2x + 2y = 4$

Space for Rough Work

26. If the graph of the polynomial $p(x) = ax^2 + bx - c$ is as shown in the figure, then which of the following is not true?



- | | |
|--------------|---------------|
| (1) $bc > 0$ | (2) $ac > 0$ |
| (3) $ab < 0$ | (4) $abc < 0$ |

SECTION-III : ASSERTION & REASON TYPE

This section contains 1 Assertion-Reason type question, which has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

27. **A** : Roots of the equation $x^2 - 10x + 17 = 0$ are $5 + 2\sqrt{2}$ and $5 - 2\sqrt{2}$.

R : For a quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$, if $b^2 - 4ac$ is a perfect square and a, b, c are rational, then the roots are irrational and of the form $p + \sqrt{q}$ and $p - \sqrt{q}$.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is true but (R) is false
- (4) (A) is false but (R) is true

Space for Rough Work

SECTION-IV : MATRIX MATCH TYPE

This section contains 1 Matrix Match type question, which has 2 Columns (Column I and Column II). Column I has four entries (A), (B), (C) and (D), Column II has four entries (P), (Q), (R) and (S). Match the entries in Column I with the entries in Column II. Each entry in Column I may match with one or more entries in Column II.

For each entry in Column I, tick the boxes of all the matching entries in Column II. For example, if entry (A) in Column I matches with entries (P) & (S) in Column II, then tick the boxes (P) & (S). Similarly, tick the boxes for entries (B), (C) and (D).

	P	Q	R	S
A.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

28. Match the columns

Column I	Column II
(A) If $\sin^3\theta$ and $\cos^3\theta$ are the zeroes of a quadratic polynomial $P(x)$ and $\sin\theta + \cos\theta = \frac{7}{5}$, then $15625 P(x)$ can be expressed as	(P) 15
(B) The mean of three angles is 70° . If one angle is complementary of the smallest angle (θ) and the other angle is four times of the smallest angle (θ), then $\tan 2\theta$ is	(Q) $15625x^2 - 11375x + 1728$
(C) If the mid-points of the longest side of the triangle formed by the lines $4x + 3y = 12$, $x = 0$ and $y = 0$ is $(3\sin\alpha, 4\cos\beta)$, then $\cot(3\alpha - \beta)$ is	(R) $(9^2 + 12^2)^{\frac{1}{2}}$
(D) The value of $\left(3\sin^2\theta + \frac{5}{\sin^2\delta}\right) - \left(7\tan^2\phi + \frac{5}{\tan^2\delta}\right) + \left(3\cos^2\theta + \frac{7}{\cos^2\phi}\right)$, is	(S) $\sqrt{3}$

Space for Rough Work

MENTAL ABILITY**SECTION-I : SINGLE ANSWER TYPE**

This section contains 6 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** is correct.

29. Mirror image of

22:59

will be

(1) 65:22

(2) 55:22

(3) 55:22

(4) 22:55

30. $84 : 23 :: 89 : 27 :: 64 : 42 :: 36 : ?$

(1) 81

(2) 72

(3) 57

(4) 46

31. If ANTHE is coded as THENA, BEAUTY is coded as AUTYBE, then the code for ITUTOR is

(1) UTOTRI

(2) UOTRTI

(3) UTROIT

(4) UTORIT

32. The number which replaces the question mark (?) in the following pattern is

1	3	6	9
1	5	2	1
1	6	8	1
1	?	4	9

(1) 8

(2) 9

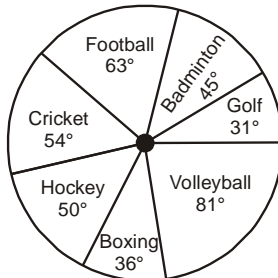
(3) 6

(4) 7

Space for Rough Work

Direction (Q.33) : Study the given pie chart and answer the following questions.

Expenditure of a sports club on different sports for a year.



33. The percentage expenditure on football is

(1) 63%

(2) $22\frac{1}{2}\%$

(3) $17\frac{1}{2}\%$

(4) 54%

34. A is father-in-law of B, who is wife of C. D is mother of C, who is father of E. How A is related to E?

(1) Brother

(2) Uncle

(3) Grandfather

(4) Father

SECTION-II : MORE THAN ONE ANSWER TYPE

This section contains 1 multiple choice question, which has 4 choices (1), (2), (3) and (4) out of which **MORE THAN ONE** answer may be correct.

35. If NOT is coded as LKF and FLY is coded as TNA, then which of the following word/s has/have correct coding?

(1) TOP – FKJ

(2) RUN – IFM

(3) MUG – MES

(4) HOT – RKG

☐ ☐ ☐

Space for Rough Work



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Our Result in Medical & Engineering Entrance Exams 2019

80081 in NEET

69826 Classroom + 10255 Distance & Digital

688 for AIIMS

576 Classroom + 112 Distance & Digital

7879 in JEE (Main)

7250 Classroom + 629 Distance & Digital

1633 in JEE (Adv.)

1441 Classroom + 192 Distance & Digital

Our Result in Olympiads/Scholarship Exams

1598 in PRMO
2019

1556 Classroom + 42 Distance & Digital

115 in RMO
2019

111 Classroom + 4 Distance & Digital

949 in NTSE
Stage-I 2019-20

832 Classroom + 117 Distance & Digital

366 in NTSE
Stage-II 2019

317 Classroom + 49 Distance & Digital

767 in NSEs
2019

701 Classroom + 66 Distance & Digital

481 in IMO
Level-I 2018-19

466 Classroom + 15 Distance & Digital

800 in NSO
Level-I 2019-20

728 Classroom + 72 Distance & Digital

26 in INO
2020

20 Classroom + 06 Distance & Digital

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