

**ISMART SAMPLE PAPER
FOR CLASS 10th
MOVING TO CLASS 11th (ASPIRE)
(Non Medical)**

Test ID : 00000000

Time : 90 min.

M. Marks: 240

The Test Consists (TOTAL 60 QUESTIONS)		
SUBJECTS	Qs.	SYLLABUS
PHYSICS	20	Light, Human Eye, Electricity
CHEMISTRY	20	Chemical Changes and Reactions, Acid, Bases And Salts, Metals And Non Metals
MATHEMATICS	20	Coordinate Geometry, Circles Arithmetic Progression, Quadratic Equations, Triangles, Trigonometry

INSTRUCTIONS TO CANDIDATE

- Please read the instructions given for each question carefully and fill the correct answer against the question numbers on the answer sheet in the respective subject.
- Use ball point pen to darken the appropriate circle & mark should completely fill the circle.
- The Question paper contains blank spaces for your rough work. No additional sheet will be provided for rough work.
- Blank papers, Clipboards, Log Tables, Slide rule, Calculators, Cellular phones, Pagers and Electronic gadgets in any form are not allowed.
- Write your Name, Student ID in the block at the top of the Answer Sheet. Also write your Name & Student ID in the space provided on this cover page of question paper.

Name: _____ Student ID _____

Physics

Objective Questions [+4, -1]

1. An object A is placed at a distance d in front of a plane mirror. If one stands directly behind the object at a distance S from the mirror, then the distance of the image of A from the individual is

(A) $2S$ (B) $2d$
(C) $S + d$ (D) $S + 2d$

2. Which of the following conditions are necessary for total internal reflection to take place at the boundary of two optical media?

I. Light is passing from optically denser medium to optically rarer medium.
II. Light is passing from optically rarer medium to optically denser medium.
III. Angle of incidence is greater than the critical angle.
IV. Angle of incidence is less than the critical angle.

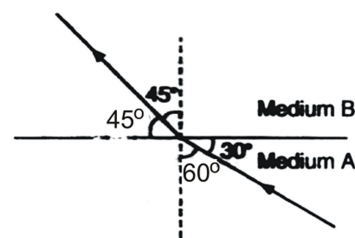
(A) I and III only (B) II and IV only
(C) III and IV only (D) I and IV only

3. A wire of radius r has resistance R . If it is

stretched to a radius of $\frac{3r}{4}$, its resistance becomes

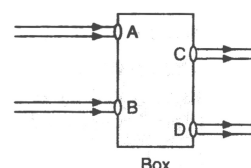
(A) $\frac{9R}{16}$ (B) $\frac{16R}{9}$
(C) $\frac{81R}{256}$ (D) $\frac{256R}{81}$

4. Figure shows a ray of light as it travels from medium A to medium B. Refractive index of the medium B relative to medium A is :



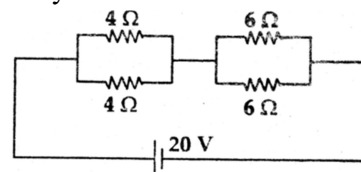
(A) $\sqrt{3}/\sqrt{2}$ (B) $\sqrt{2}/\sqrt{3}$
(C) $1/\sqrt{2}$ (D) $\sqrt{2}$

5. Beams of light are incident through the holes A and B and emerge out of box through the holes C and D respectively as shown in the figure. Which of the following could be inside the box?



(A) A rectangular glass slab
(B) A convex lens
(C) A concave lens (D) A prism

6. Four resistances are connected in a circuit as shown. The electric current flowing through each of the 4Ω and 6Ω resistances will be respectively



(A) 1 A and 1 A (B) 1 A and 2 A
(C) 2 A and 2 A (D) 2 A and 4 A

7. Magnification produced by a rear view mirror fitted in vehicles :

(A) is less than one (B) is more than one
(C) is equal to one (D) can be more than or less than one

depending upon the position of the object in front of it.

8. The resistivity of a wire depends on its :-
 (A) Length (B) Area of cross-section
 (C) Shape (D) Material

9. Four students, A, B, C and D did their experiment on finding the focal length of a convex lens by obtaining the image of a distant object as follows:

Student A Used the window grille in the laboratory as the object, and a white paper sheet held in hand, as the screen.

Student B Used a distant tree in the shade as the object, and a white thick board, held in stand, as the screen.

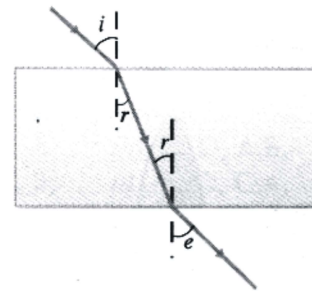
Student C Used a well illuminated laboratory window grille as the object and a white paper sheet held in a stand as the screen.

Student D Used a well illuminated distant tree as the object and a white thick board, held in a stand as the screen.

Which one of the four sequences of above set-ups represents the decreasing order of preference for performing the experiment ?

- (A) D, B, C, A (B) C, D, A, B
 (C) D, C, A, B (D) B, D, C, A

10. While tracing the path of a ray of light passing through glass slab as shown in the diagrams, four students interpreted the results as given below :

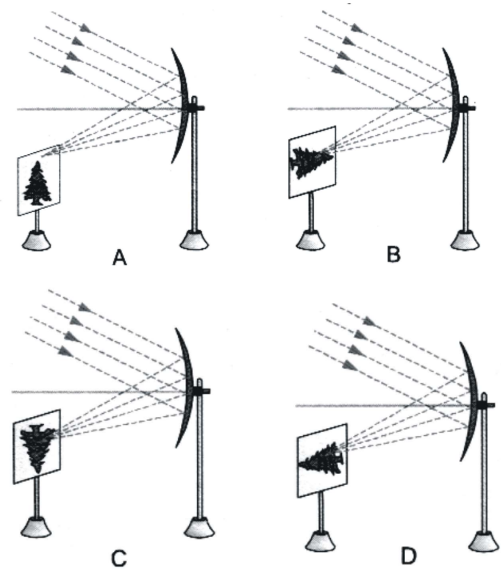


- (A) $\angle r > \angle e = \angle i$
 (B) $\angle r = \angle e < \angle i$
 (C) $\angle i = \angle r < \angle e$
 (D) $\angle i = \angle e > \angle r$

The student who has made the correct interpretation is

- (A) A (B) B
 (C) C (D) D

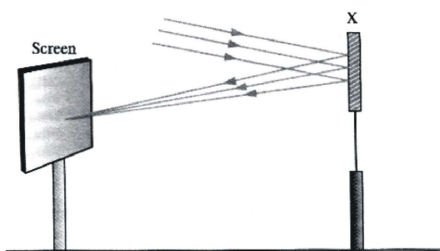
11. Parallel rays, from the top of distant tree, incident on a concave mirror, form an image on the screen.



The diagram correctly showing the image of the tree on the screen is

- (A) A (B) B
(C) C (D) D

12. A student focussed the image of a distant object on the screen as shown in the figure by using a device X. This device 'X' could be



- (A) Plane mirror (B) Concave mirror
(C) Convex mirror (D) Convex lens

13. The image of a candle is formed by a convex lens on a screen. If the lower half of the lens is painted black, to make it completely opaque. What will be the size and intensity of the image attained?

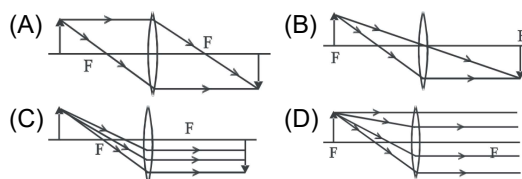


- (A) image same, (B) image and intensity reduced intensity remain same
(C) image small, (D) image becomes intensity same bigger, intensity reduced

14. An object is placed 30 cm in front of a convex mirror of focal length 15 cm. Calculate the nature and position of image
(A) Image is real, (B) Image is real, inverted and 15 cm virtual and 20 cm behind mirror behind mirror
(C) Image is erect, (D) Image is real, virtual and 10 cm virtual and erect

behind mirror and 15 cm from mirror

15. Which of the following ray diagram is correct?



Integer Answer Type

[+4]

This section contains 5 questions. The answer to each of the questions is a **single digit integer**, ranging from 0 to 9. The bubble corresponding to the correct is to be darkened in the ORS.

16. An object of size 2.0 cm is placed perpendicular to the principal axis of a concave mirror. The distance of the object from the mirror equals the radius of curvature. The size of the image will be (in cm)
17. A lens of focal length 12 cm forms an erect image, three times the size of an object. The distance between the object and image is :
18. Two lenses of powers + 6.0 D and -4.0 D are put in contact with each other. The power of the combination is :
19. Speed of light in air is $3 \times 10^8 \text{ ms}^{-1}$. While its speed in a medium is $1.5 \times 10^8 \text{ ms}^{-1}$, then refractive index of this medium is :
20. The radius of curvature of concave mirror is 12 cm. Then, the focal length will be (Magnitude)

Chemistry

Objective Questions [+4, -1]

21. A change is said to be a chemical change when
 (A) Energy change occurs (B) New substances are formed
 (C) The change cannot be easily reversed (D) All statements are correct
22. Which of the following are chemical changes
 (i) Digestion of food
 (ii) Liquefaction of air
 (iii) Ripening of fruit
 (iv) Dissolution of sulphur in carbon disulphide
 (v) Freezing of water
 (vi) Electrosynthesis of water
 (A) (i) to (iv) all (B) (i), (iii) & (v)
 (C) (i), (iii) & (vi) (D) (iii), (iv) & (vi)
23. In the following equations:
 $Na_2CO_3 + xHCl \rightarrow 2NaCl + CO_2 + H_2O$,
 the value of x is -
 (A) 1 (B) 2
 (C) 3 (D) 4
24. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$
 The above reaction is an example of a -
 (A) combination reaction (B) double displacement reaction
 (C) decomposition reaction (D) displacement reaction
25. Which of the following is not a decomposition reaction?
 (A) $CaCO_3 \rightarrow CaO + CO_2$ (B) $2KClO_3 \rightarrow 2KCl + 3O_2$
 (C) Digestion of food in body (D) $H_2 + Cl_2 \rightarrow 2HCl$
26. Which is the oxidising agent in the following reaction?
 $CuO(s) + H_2(g) \longrightarrow Cu(s) + H_2O(l)$
 (A) $CuO(s)$ (B) $H_2(g)$
 (C) $Cu(s)$ (D) $H_2O(l)$
27. Which of the following is a strong acid?
 (A) Lactic acid (B) Ascorbic acid
 (C) Sulphuric acid (D) Formic acid
28. Which of the following is a strong base?
 (A) Ammonium hydroxide (B) Sodium hydroxide
 (C) Magnesium hydroxide (D) Copper hydroxide
29. Which of the following is a dibasic acid?
 (A) HCl (B) H_3PO_4
 (C) HNO_3 (D) H_2SO_4
30. The formula of baking soda is :
 (A) K_2CO_3 (B) $KHCO_3$
 (C) $NaHCO_3$ (D) Na_2CO_3
31. Oxides of metals are generally
 (A) acidic (B) basic
 (C) amphoteric (D) neutral
32. Common name of $CaOCl_2$ is -
 (A) Bleaching powder (B) Baking soda
 (C) Plaster of paris (D) Washing soda
33. Which oxide is neutral?
 (A) NO_2 (B) MgO
 (C) H_2O (D) None of these
34. An alloy is -
 (A) A element (B) A mixture
 (C) An isomer (D) A metalloid
35. What happens when calcium is treated with water?
 (i) It does not react with water
 (ii) It reacts violently with water
 (iii) It reacts less violently with water
 (iv) Bubbles of hydrogen gas formed stick

to the surface of calcium

- (A) (i) and (iv) (B) (ii) and (iii)
(C) (i) and (ii) (D) (iii) and (iv)

Integer Answer Type [+4]

This section contains 5 questions. The answer to each of the questions is a **single digit integer**, ranging from 0 to 9. The bubble corresponding to the correct is to be darkened in the ORS.

36. pH of 10^{-3} M HCl solution is
37. The number of water molecules of crystallisation in green vitriol is
38. The basicity of sulphuric acid is
39. pH of pure water sample is
40. How many total electrons are shared when two N atoms combine to form N_2 molecule

Mathematics

Objective Questions [+4, -1]

41. Which of the following rational numbers have a terminating decimal expansion?
(A) $\frac{125}{441}$ (B) $\frac{77}{210}$
(C) $\frac{15}{1600}$ (D) $\frac{129}{2^2 \times 5^2 \times 7^2}$
42. The value of p for which the polynomial $x^3 + 4x^2 - px + 8$ is exactly divisible by $(x - 2)$ is :
(A) 16 (B) 12
(C) 15 (D) 14
43. What must be added to $2x - x^4 - 3x^3 + 4$ so that the resulting polynomial is divisible by $x^2 - 3$?
(A) $7x + 5$ (B) $-7x - 5$
(C) $x + 2$ (D) $-x - 2$

44. If $x = 2$ and $x = 3$ are zeros of the quadratic polynomial $x^2 + ax + b$, the values of a and b respectively are :

- (A) 5, 6 (B) -5, -6
(C) -5, 6 (D) 5, 6

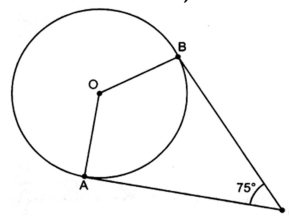
45. If the sum of the AP 3, 7, 11, is 210, then the number of terms in this AP is

- (A) 12 (B) 15
(C) 10 (D) 11

46. If the n^{th} term of a sequence is $5 + 2n$, then the sum to first 20 terms is

- (A) 485 (B) 520
(C) 525 (D) 540

47. In figure, O is the centre of the circle, CA is tangent at A and CB is tangent at B drawn to the circle. If $\angle ACB = 75^\circ$, then $\angle AOB =$



- (A) 75° (B) 85°
(C) 95° (D) 105°

48. If $a = b \tan \theta$, then $\frac{a \sin \theta + b \cos \theta}{a \sin \theta - b \cos \theta}$ is equal

to :

- (A) $\frac{a^2 + b^2}{a^2 - b^2}$ (B) $\frac{a^2 - b^2}{a^2 + b^2}$
(C) $\frac{a + b}{a - b}$ (D) $\frac{a - b}{a + b}$

49. If $3 \cos \theta = 5 \sin \theta$, then the value of $\frac{5 \sin \theta - 2 \sec^3 \theta + 2 \cos \theta}{5 \sin \theta + 2 \sec^3 \theta - 2 \cos \theta}$ is

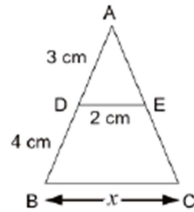
- (A) $\frac{271}{979}$ (B) $\frac{316}{2937}$

- (C) $\frac{542}{2937}$ (D) None of these

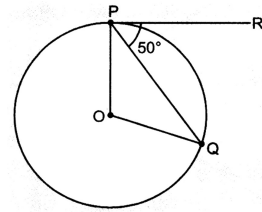
50. If A, B and C are interior angles of a triangle

$$ABC, \text{ then } \sin\left(\frac{B+C}{2}\right) =$$

- (A) $\sin \frac{A}{2}$ (B) $\cos \frac{A}{2}$
 (C) $-\sin \frac{A}{2}$ (D) $-\cos \frac{A}{2}$
51. The area's of two similar triangles ABC and PQR are 25 cm^2 and 49 cm^2 respectively. If $QR = 9.8 \text{ cm}$, then BC is :
- (A) 9.8 cm (B) 7 cm
 (C) 49 cm (D) 25 cm
52. In figure, if $DE \parallel BC$ then x equals to :



- (A) 3 cm (B) 4 cm
 (C) 7 cm (D) 4.7 cm
53. The quadratic equation whose roots are real and equal is :
- (A) $2x^2 - 4x + 3 = 0$ (B) $x^2 - 4x + 4 = 0$
 (C) $3x^2 - 5x + 2 = 0$ (D) $x^2 - 2\sqrt{2}x - 6 = 0$
54. The roots of the equation $3x^2 + 4x + 3 = 0$ are :
- (A) real and unequal (B) real and equal
 (C) imaginary (D) none of these
55. In figure, if O is the centre of the circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ, then $\angle POQ$ is equal to



- (A) 100° (B) 80°
 (C) 90° (D) 75°

Integer Answer Type

[+4]

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56. If n is any natural number, then $6^n - 5^n$ always ends with.
57. HCF of 616 and 1300, using Euclid's algorithm is :-
58. If D, E, F are respectively the mid points of the sides BC, CA and AB of ΔABC and the area of ΔABC is 24 sq. cm , then the area of ΔDEF is :-
59. If LCM of 4 and 52 is 52, then their HCF is :-
60. If one zero of $2x^2 - 3x + k$ is reciprocal to the other, then the value of k is :

Answer Key

1. C
2. A
3. D
4. A
5. A
6. C
7. A
8. D
9. A
10. D
11. C
12. B
13. A
14. C
15. B
16. 2
17. 8
18. 2
19. 2
20. 6
21. D
22. C
23. B
24. D
25. D
26. A
27. C
28. B
29. D
30. C
31. B
32. A
33. C
34. B
35. D
36. 3
37. 7
38. 2
39. 7
40. 6
41. C
42. A

43. A
 44. C
 45. C
 46. B
 47. D
 48. A
 49. A
 50. B
 51. B
 52. D
 53. B
 54. C
 55. A
 56. 1
 57. 4
 58. 6
 59. 4
 60. 2
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