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, Electricity, Human Eye
CHEMISTRY	20	Chemical Changes and Reactions, Acid, Bases And Salts, Metals And Non Metals
MATHEMATICS	20	Coordinate Geometry, Polynomials, 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) 2 S (B) 2 d
(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?

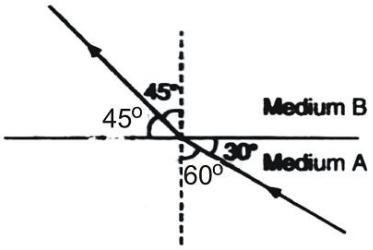
I. Light is passing from optically denser medium to optically rarer medium.
II. Light is passing from optically rarer medium to optically denser medium.
III. Angle of incidence is greater than the critical angle.
IV. Angle of incidence is less than the critical angle.

(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

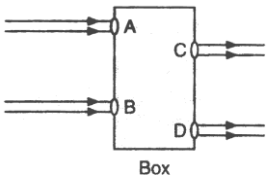
(A) $\frac{9R}{16}$ (B) $\frac{16R}{9}$
(C) $\frac{81R}{256}$ (D) $\frac{256R}{81}$

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 :



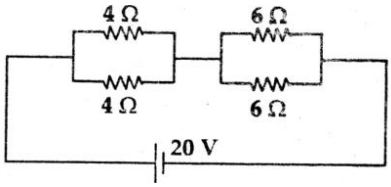
(A) $\sqrt{3}/\sqrt{2}$ (B) $\sqrt{2}/\sqrt{3}$
(C) $1/\sqrt{2}$ (D) $\sqrt{2}$

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.

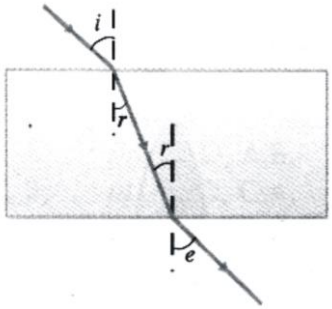
Student D Used a well illuminated distant tree as the object and a white thick board, held in a stand as the screen.

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) $\angle i = \angle r < \angle e$

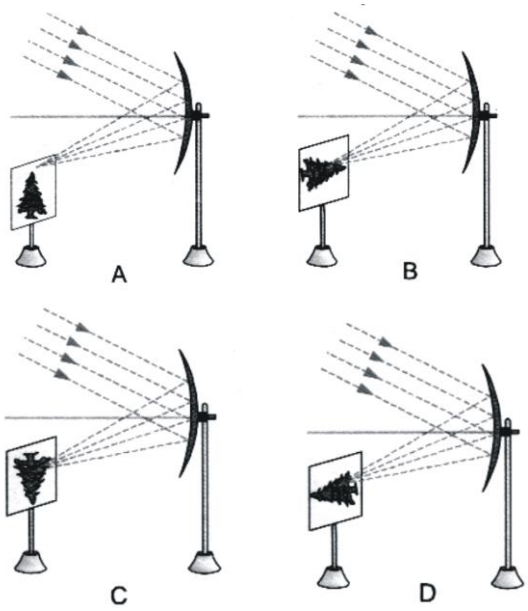
(D) $\angle i = \angle e > \angle r$

The student who has made the correct interpretation is

(A) A (B) B

(C) C (D) D

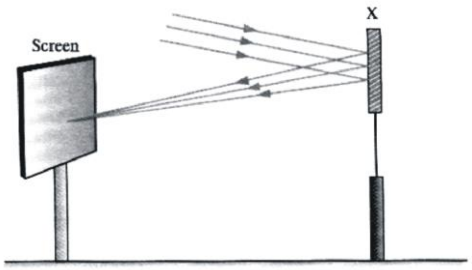
11. Parallel rays, from the top of distant tree, incident on a concave mirror, form an image on the screen.



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



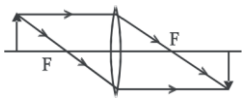
(A) Plane mirror (B) Concave mirror
(C) Convex mirror (D) Convex lens

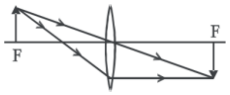
13. The image of a candle is formed by a convex lens on a screen. If the lower half of the lens is painted black, to make it completely opaque. What will be the size and intensity of the image attained?

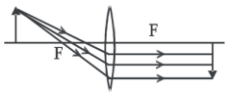
(A) image same, intensity reduced (B) image and intensity remain same
(C) image small, intensity same (D) image becomes bigger, intensity reduced

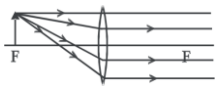
14. An object is placed 30 cm in front of a convex mirror of focal length 15 cm. Calculate the nature and position of image
(A) Image is real, inverted and 15 cm behind mirror (B) Image is real, virtual and 20 cm behind mirror
(C) Image is erect, virtual and 10 cm behind mirror (D) Image is real, virtual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

15. Which of the following ray diagram is correct?

(A) 

(B) 

(C) 

(D) 

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.

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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 3×10^8 ms^{-1}. While its speed in a medium is 1.5×10^8 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) Electrosysis of water
(A) (i) to (iv) all
(B) (i), (iii) & (v)
(C) (i), (iii) & (vi)
(D) (iii), (iv) & (vi)

23. In the following equations:
$Na_2CO_3 + xHC1 \rightarrow 2\,NaC1 + CO_2 + H_2O,$
the value of *x* is -
(A) 1
(B) 2
(C) 3
(D) 4

24. $Fe_2O_3 + 2A1 \rightarrow A1_2O_3 + 2Fe$
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) $2KC1O_3 \rightarrow 2KC1 + 3O_2$
(C) *Digestion of food in body*
(D) $H_2 + C1_2 \rightarrow 2HC1$

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) HC1
(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]***

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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. If $\frac{\sqrt{x}}{11} = 0.1$, then $x =$
(A) 12.1 (B) $\sqrt{1.1}$
(C) 1.21 (D) $\sqrt{11}$

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. The least positive value of k, for which the quadratic equation $2x^2 + kx - 4 = 0$ has rational roots, is
(A) $\pm 2\sqrt{2}$ (B) 2
(C) ± 2 (D) $\sqrt{2}$

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) $\frac{a - b}{a + b}$

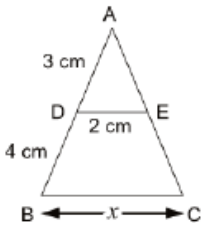
49. If $3\cos\theta = 5\sin\theta$, then the value of $\frac{5\sin\theta - 2\sec^3\theta + 2\cos\theta}{5\sin\theta + 2\sec^3\theta - 2\cos\theta}$ is
(A) $\frac{271}{979}$ (B) $\frac{316}{2937}$
(C) $\frac{542}{2937}$ (D) None of these

50. If A, B and C are interior angles of a triangle ABC, 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 cm, then *BC* is :
(A) 9.8 cm (B) 7 cm
(C) 49 cm (D) 25 cm

52. In figure, if DE || 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. If $A(1,3), B(-1,2), C(2,5)$ and $D(x,y)$ are the vertices of a parallelogram ABCD, then the value of x is
(A) 3 (B) 4
(C) 0 (D) $\frac{3}{2}$

Integer Answer Type ***[+4]***

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56. If $x + y = 5$ and $xy = 7$ then value of $x^3 + y^3$ is

57. If $p - 1$, $p + 1$ and $2p + 3$ are in A.P.,then the value of p 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 24sq. cm, then the area of ΔDEF is :-

59. If $x = a\cos\theta$ and $y = b\sin\theta$; Here $b^2x^2 + a^2y^2 - a^2b^2 =$

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. B
56. 20
57. 0
58. 6
59. 0
60. 2