

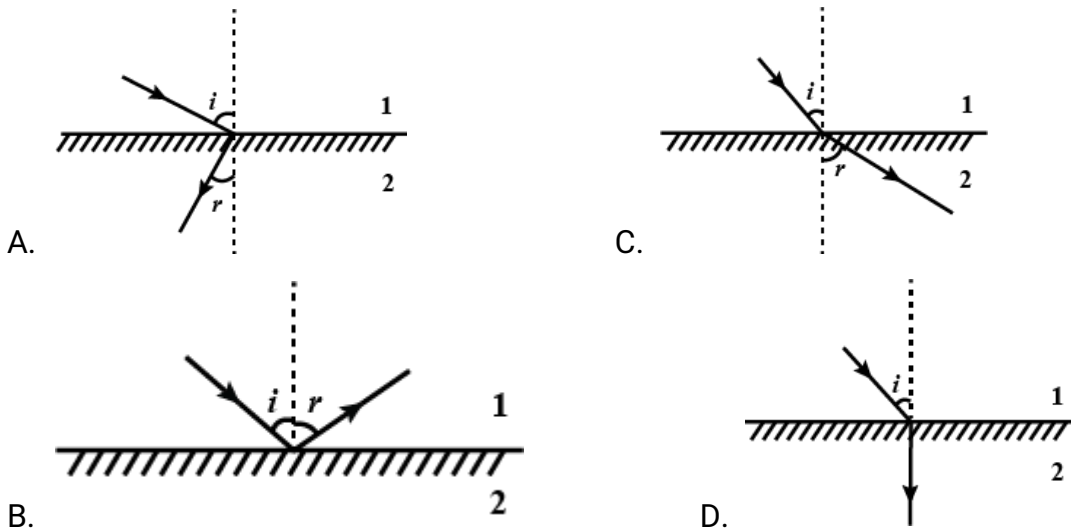
# Mana Barnoota Bultii Addaa Waldaa Misooma Oromiyaa Oromia Development Association Special Boarding School



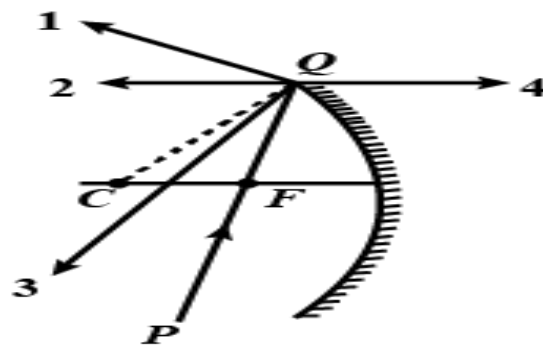
2022 Academic Year Semester II Physics Practice Questions for Grade 12 from  
Grade 10 Topics

I. Choose the correct answer for each question from the given alternatives.

1. There are certain material developed in laboratories which have a negative refractive index (figure). A ray incident from air (medium 1) into such a medium (medium 2) shall follow a path given by



2. The direction of ray of light incident on a concave mirror is shown by PQ while directions in which the ray would travel after reflection is shown by four rays marked 1, 2, 3 and 4 (figure). Which of the four rays correctly shows the direction of reflected ray?



(A)1      (B)2      (C)3      (D)4

3. When a semiconductor is heated, its resistance  
A. decreases (B) increases (C) remains unchanged (D) nothing is definite
4. An object is placed at a distance of 40 cm in front of a concave mirror of focal length 20 cm. The image produced is  
A. real, inverted and smaller in size      C. real, inverted and of same size

B. real and erect

D. virtual and inverted

5. A telescope has an objective of focal length 100 cm and an eyepiece of focal length 5 cm. What is the magnifying power of the telescope when the final image is formed at the least distance of distinct vision ?

A. 20

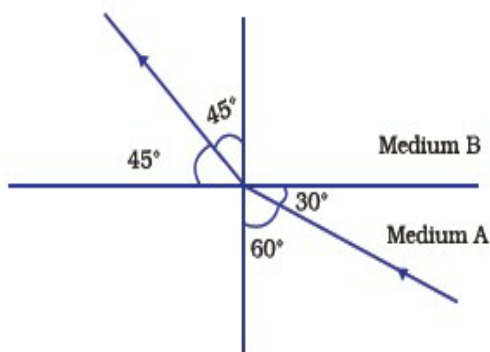
(B) 24

(C) 28

(D) 32

6. The given 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.  $\frac{\sqrt{3}}{\sqrt{2}}$

B.  $\frac{\sqrt{2}}{\sqrt{3}}$

C.  $\frac{\sqrt{3}}{2}$

D.  $\frac{1}{\sqrt{3}}$

7. Which of the following is not due to total internal reflection?

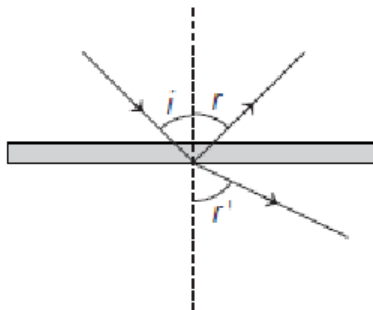
A. Working of optical fibre

B. Difference between apparent and real depth of pond

C. Mirage on hot summer days

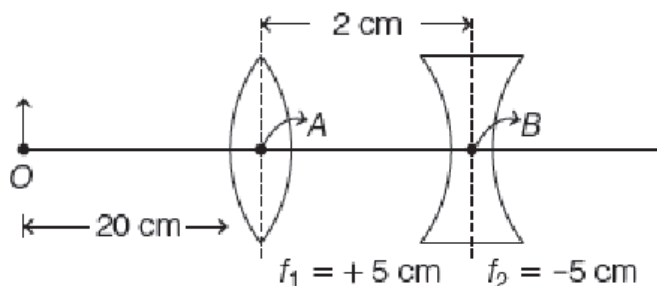
D. Brilliance of diamond

8. A ray of light from a denser medium strikes a rarer medium at an angle of incidence  $i$ . The reflected and refracted rays make an angle of  $\pi/2$  with each other. If the angles of reflection and refraction are  $r$  and  $r'$ , then the critical angle will be

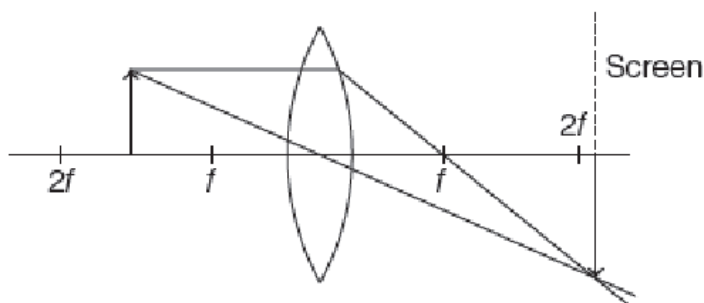


(A)  $\sin^{-1}(\tan r)$  (B)  $\sin^{-1}(\cot i)$  (c)  $\sin^{-1}(\tan r')$  (d)  $\tan^{-1}(\sin i)$

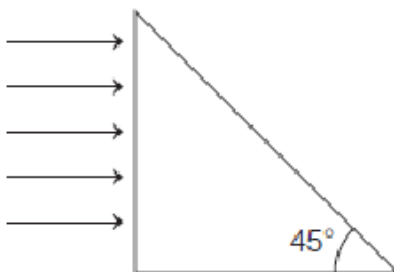
9. What is the position and nature of image formed by lens combination shown in figure?  
(where,  $f_1$  and  $f_2$  are focal lengths)



- A.  $\frac{20}{3}$  cm from point B at right, real  
 B. 40 cm from point B at right, real  
 C. 70 cm from point B at right, real  
 D. 70 cm from point B at left, virtual
10. Formation of real image using a biconvex lens is shown below. If the whole set up is immersed in water without disturbing the object and the screen positions, what will one observe on the screen?



- (A) No Change (B) Magnified image (C) Image disappears (D) Erect real image
11. A beam of light consisting of red, green and blue colours is incident on a right-angled prism. The refractive indices of the material of the prism for the above red, green and blue wavelengths are 1.39, 1.44 and 1.47 respectively. The prism will



- A. separate the red colour from the green and blue colours  
 B. separate the blue colour from the red and green colours  
 C. separate all the three colours from one another

D. not separate even partially any colour from the other two colours.

12. In a compound microscope, the intermediate image is

- A. virtual, erect and magnified
- B. real, inverted and magnified
- C. real, erect and magnified
- D. virtual, erect and reduced

13. Two beams of red and violet colours are made to pass separately through a prism (angle of the prism is  $60^\circ$ ). In the position of minimum deviation, the angle of refraction will be

- A.  $30^\circ$  for both the colours
- B. greater for the red colour
- C. greater for the violet colour
- D. equal but not  $30^\circ$  for both the colours

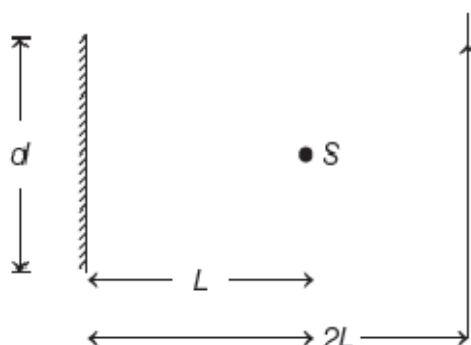
14. When a ray of light enters a glass slab from air

- A. its wavelength decreases
- B. its wavelength increases
- C. its frequency increases
- D. neither its wavelength nor its frequency changes

15. A ray of light travelling in water is incident on its surface open to air. The angle of incidence is  $q$ , which is less than the critical angle. Then there will be

- A. only a reflected ray and no refracted ray
- B. only a refracted ray and no reflected ray
- C. a reflected ray and a refracted ray and the angle between them would be less than  $180^\circ - 2\theta$
- D. a reflected ray and a refracted ray and the angle between them would be greater than  $180^\circ - 2\theta$

16. A point source of light, S is placed at a distance L in front of the centre of plane mirror of width d which is hanging vertically on a wall. A man walks in front of the mirror along a line parallel to the mirror, at a distance 2L as shown below. The distance over which the man can see the image of the light source in the mirror is



- A.  $\frac{d}{2}$       B. d      C. 3d      D. 2d

17. A concave lens of focal length 20 cm produces an image half in size of the real object. The distance of the real object is

- A. 20 cm      (B) 30 cm      (C) 10 cm      (D) 60 cm

18. An object is placed 30 cm to the left of a diverging lens whose focal length is of magnitude 20 cm. Which one of the following correctly states the nature and position of the virtual image formed?

- | Nature of image       | Distance from lens |
|-----------------------|--------------------|
| A. inverted enlarged  | 60 cm to the right |
| B. erect, diminished  | 12 cm to the left  |
| C. inverted, enlarged | 60 cm to the left  |
| D. erect, diminished  | 12 cm to the right |

19. A convex mirror forms an image one-fourth the size of the object. If object is at a distance of 0.5 m from the mirror, the focal length of mirror is

- (A) 0.17m      (B) -1.5 m      (C) 0.4      (D) -0.4 m

20. A person of 6 feet in length can see his full size erect image in a mirror 2 feet in height. This mirror has to be

- (A) plane or convex      (B) plane or concave  
(C) necessarily convex      (D) necessarily concave

21. A plane mirror is reflecting a ray of incident light is rotated through an angle of about an axis through the point of incidence in the plane of the mirror perpendicular to the plane of incident, then

- A. The reflected ray rotates through a angle  $2\theta$       C. The reflected ray does not rotate  
B. The reflected ray rotates through and angle of  $\theta$       D. None of the above

22. The focal length of a concave mirror is 20 cm. where an object must be placed to form an image magnified to times when the image is real?

- (A) -30 cm from the mirror      (C) 20 cm from the mirror  
(B) 10 cm from the mirror      (D) 15 cm from the mirror

23. A candle is placed before a thick plane mirror. When looked obliquely in the mirror, a number of images are seen from the surfaces of the plane mirror. Then

- (A) First image is brightest      (C) Third image is brightest  
(B) Second image is brightest      (D) All images beyond second are brightest

24. When a convergent beam of light is incident on a plane mirror, the image formed is

- |                         |                          |
|-------------------------|--------------------------|
| (A) Upright and real    | (C) Inverted and virtual |
| (B) Upright and virtual | (D) Inverted and real    |

25. The focal length of objective and eye lens of an astronomical telescope are respectively 2 cm and 5 cm. Final image is formed at (1) least distance of distinct vision (2) infinity. Magnifying powers in two cases will be

- |             |            |            |             |
|-------------|------------|------------|-------------|
| (A)-48, -40 | (B)-40, 48 | (C)-40,+48 | (D)-48, +40 |
|-------------|------------|------------|-------------|

26. Which statement is correct?

- A. N-type germanium is negatively charged and P-type germanium is positively charged
- B. Both N-type and P-type germanium are neutral
- C. N-type germanium is positively charged and P-type germanium is negatively charged
- D. Both N-type and P-type germanium are negatively charged

27. Electronic configuration of germanium is 2, 8, 18 and 4, To make it extrinsic semiconductor small quantity of antimony is added

- A. The material obtained will be N-type germanium in which electrons and holes are equal in number
- B. The material obtained will be P-type germanium
- C. The material obtained will be N-type germanium which has more electrons than holes at room temperature
- D. The material obtained will be N-type germanium which has less

28. Choose the correct statement

- A. When we heat a semiconductor its resistance increases
- B. When we heat a semiconductor its resistance decreases
- C. When we cool a semiconductor to 0 K then it becomes super conductor
- D. Resistance of a semiconductor is independent of temperature

29. The reverse biasing in a PN junction diode

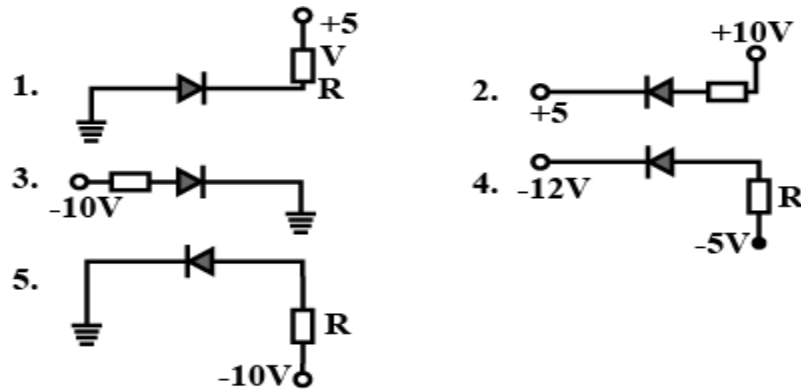
- A. decreases the potential barrier
- B. increases the potential barrier
- C. increases the number of minority charge carriers
- D. increases the number of majority charge carriers

30. The dominant mechanisms for motion of charge carriers in forward and reverse biased silicon P-N junctions are

- A. Drift in forward bias, diffusion in reverse bias
- B. Diffusion in forward bias, drift in reverse bias
- C. Diffusion in both forward and reverse bias

D. Drift in both forward and reverse bias

31. In the given figure, which of the diodes are forward biased?



A. 1,2,3

B. 2,4,5

C. 1,3,4

D. 2,3,4

32. A NPN transistor conducts when

- A. both collector and emitter are positive with respect to the base
- B. collector is positive and emitter is negative with respect to the base
- C. collector is positive and emitter is at same potential as the base
- D. both collector and emitter are negative with respect to the base

33. The following truth table corresponds to the logic gate

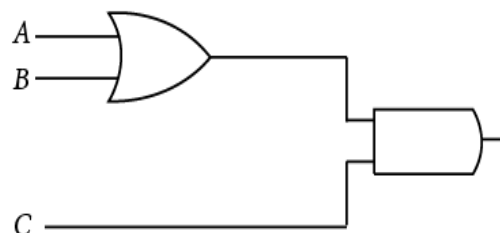
|   |   |   |   |   |
|---|---|---|---|---|
| A | 0 | 0 | 1 | 1 |
| B | 0 | 1 | 0 | 1 |
| X | 0 | 1 | 1 | 1 |

(a) NAND (b) OR (c) AND (d) XOR

34. Correct statement for 'NOR' gate is that, it gives

- A. high output when both the inputs are low
- B. low output when both the inputs are low
- C. high output when both the inputs are high
- D. None of these

35. To get an output 1 from the circuit shown in the figure, the input can be



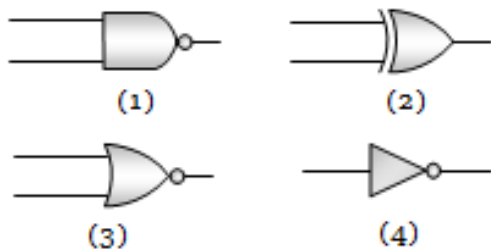
A.  $A = 0, B = 1, C = 0$

(C)  $A = 1, B = 0, C = 0$

B.  $A = 1, B = 0, C = 1$

(D)  $A = 1, B = 1, C = 0$

36. Given below are symbols for some logic gates. The XOR gate and NOR gate respectively are



- A. 1 and 2      (B) 2 and 3      (C) 3 and 4      (D) 1 and 4

37. Which of the following are false?

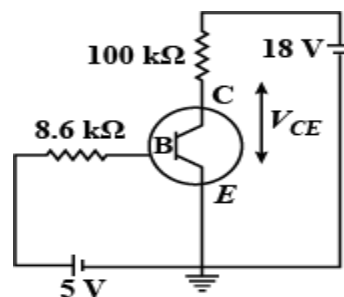
- A. Common base transistor is commonly used because current gain is maximum
- B. Common collector is commonly used because current gain is maximum
- C. Common emitter is the least used transistor
- D. Common emitter is commonly used because current gain is maximum

38. In n-p-n transistor, in CE configuration, identify true statements from the following :

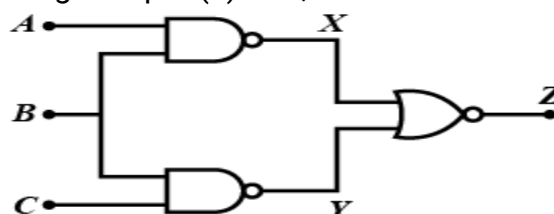
- (a) The emitter is heavily doped than the collector
- (b) Emitter and collector can be interchanged
- (c) The base region is very thin but is heavily doped
- (d) The conventional current flows from base to emitter

- A. a and d are correct      C. b and c are correct  
B. a and b are correct      D. c and d are correct

39. For the transistor circuit shown in figure, if  $\beta = 100$ , voltage drop across emitter and base is 0.7 V, then the value of  $V_{CE}$  will be :



40. A system of logic gates is shown in the figure. From the study of truth table it can be found that no produce a high output (1) at R, we must have



- A)  $X = 0, Y = 1$       B)  $X = 1, Y = 1$       C)  $X = 1, Y = 0$       D)  $X = 0, Y = 0$

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ከ9-12 ላላችሁ ተማሪዎች

እንደሚታወቀው ከ2015 ዓ.ም ጀምሮ የዩኒቨርሲቲ መግቢያ ፈተና ከ9ኛ-12ኛ ክፍል ያለውን የሚያጠቃልል ነው። ይህም ተማሪዎች ላይ ጫና መፍጠሩ የማይቀር ነው። እኛም ከ2015 ዓ.ም የት/ት ዘመን ጀምሮ በነፃ Mathematics ትምህርትን ከ9ኛ-12ኛ ክፍል ላላችሁ ተማሪዎች Example & Exercise Solution ጨምሮ ቀለል ባለ እና በሚገባችሁ መንገድ ለየት ያሉ YouTube video እያዘጋጀን የምናግዛችሁ መሆኑን ስናሳውቃችሁ በታላቅ አክብሮት ነው። ከእናንተ የሚጠበቀው በትኩረት መከታተል ብቻ ነው።

Computation የበዛበት ጊዜ ላይ ስላለን ታሪክ ለመቀየር ለስኬት ዛሬ ጀምራችሁ ተነሱ

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Mathematics ይከብዳል ማለት እና አስጠኒ መፈለግ ቀረ

*Thank You*

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