PHYSICS

BOOKS - SELINA PHYSICS (ENGLISH)

SAMPLE PAPER 1 (PHYSICS)

Questions

1. Choose the correct statement with respect to Total Internal Reflection

A. The ray of light travels at an angle greater than critical angle

B. The ray of light travels from denser medium to rarer medium

C. It does not obey the laws of reflection

D. Both 1 and 2

Answer: D

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2. The phenomenon of faces of person appear to shimmer when sitting near a campfire because of

A. refraction through different layers of optical density

B. wind blowing near the camp fire

C. total internal reflection

D. dispersion of light

Answer: A

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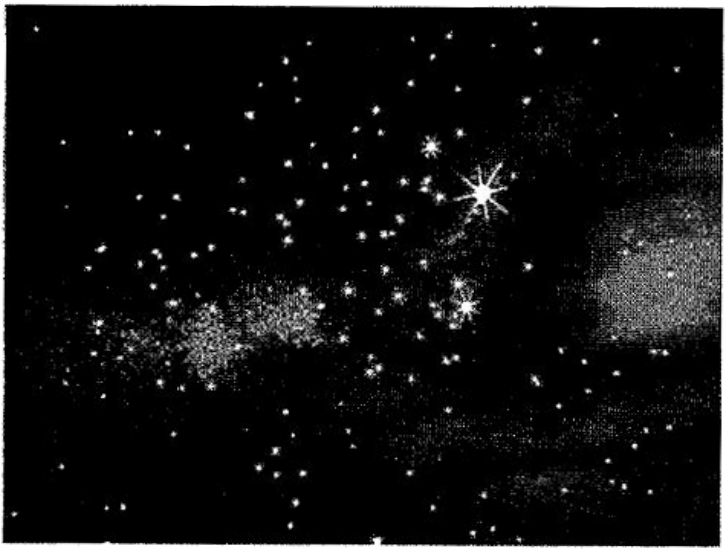
3. In the diagram below the phenomenon occurring is



A. refraction of stars

B. twinkling of stars

C. Dispersion of light

D. total internal reflection

Answer: B

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4. Identify the position of the object when a lens exhibits the following characteristics of image: real, inverted and same size

A. AtF

B. At O

C. At 2F

D. Between F and 2F

Answer: C

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5. A ray of light is incident from air into a glass slab which is silvered at its base such that the ray of light is incident normal to the mirrored surface. If refractive index of air with respect

to glass is μl then the refractive index of glass with respect to air is μ2. The relation between the two refractive indices is

A. $\mu_1 > \mu 2$

B. $\mu_1 = \mu_2$

C. $\mu_1 < \mu_2$

D. $\mu_1 = 1/\mu_2$

Answer: D

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6. The diagram below shows a spherical lens wom by an old man in which the image obtained is highly magnified and has a power of +2.0 D. With reference to this answer the following questions:

The spherical lens used is

A. convex

B. convexo concave

C. concave

D. plano convex

Answer: A

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7. The diagram below shows a spherical lens wom by an old man in which the image obtained is highly magnified and has a power of +2.0 D. With reference to this answer the following questions:

The focal length of lens is

A. 100cm

B. 25cm

C. 0.25m

D. 50 cm

Answer: D

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8. The diagram below shows a spherical lens wom by an old man in which the image obtained is highly magnified and has a power of +2.0 D. With reference to this answer the

following questions:

The distance the old man must keep the news

paper to read clearly must be

A. 15cm

B. 50 cm

C. 12.5cm

D. 25 cm

Answer: B

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9. The diagram below shows a spherical lens wom by an old man in which the image obtained is highly magnified and has a power

of +2.0 D. With reference to this answer the following questions:

If this lens is covered with moisture in the surrounding air,

A. The focal length would be halved

B. The focal length is doubled

C. The focal length would be affected

D. The focal length is $1/4$ th.

Answer: C

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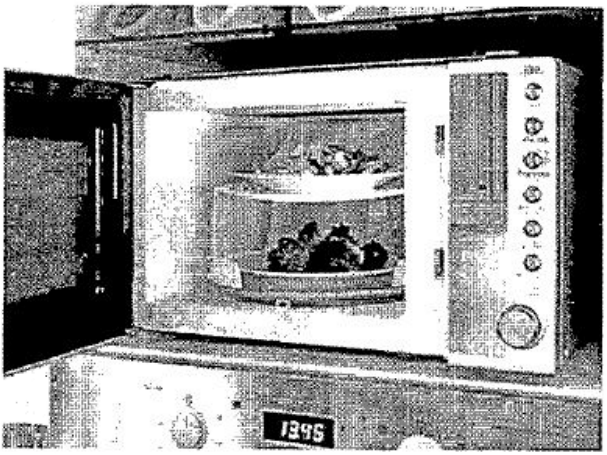
10. The energy change taking place in the following appliance is



A. Electrical to sound energy

B. Electrical to heat energy

C. Electrical to light energy

D. none of the above

Answer: B

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11. 1 MJ is equal to

A. 36kW-h

B. 0.278 kW-h

C. 746 kW-h

D. 0.36kW-h

Answer: B

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12. Pravin and Rajesh each having mass of 45 kg reach the fourth floor of a building in time 4 sec and 5 sec respectively. The ratio of their power consumed is :

A. $4:5$

B. $5:4$

C. $1:1$

D. Information is incomplete.

Answer: B

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13. Identify in which of the cases rotational equilibrium can be attained.

A. Beam balance 

B. See saw 

C. balancing origami art work 

D. All of the above

Answer: D

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14. For a given mass if kinetic energy increases 16 times the momentum:

A. increases four times

B. increases twice

C. decreases four times

D. decreases twice

Answer: A

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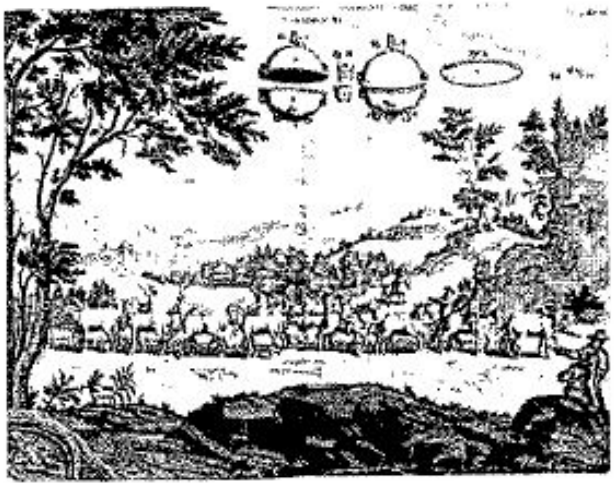
15. Observe this antique figure and answer the questions below:



Name the unit obtained from this experiment

A. kW

B. watt

C. horsepower

D. Tesla

Answer: C

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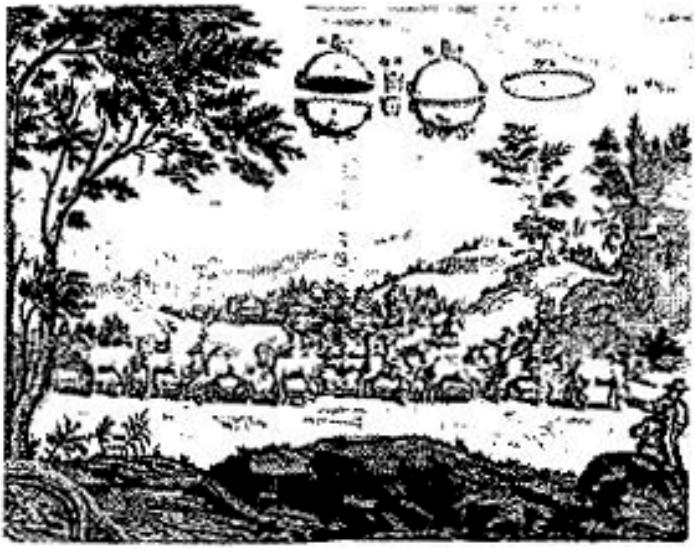
16. Observe this antique figure and answer the questions below:



What type of unit is it?

A. Mechanical unit

B. SI unit

C. CGS unit

D. FPS unit

Answer: A

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17. Observe this antique figure and answer the questions below:

How many horses were there on each side of the two hemispheres?

A. 8

B. 16

C. 20

D. 14

Answer: A

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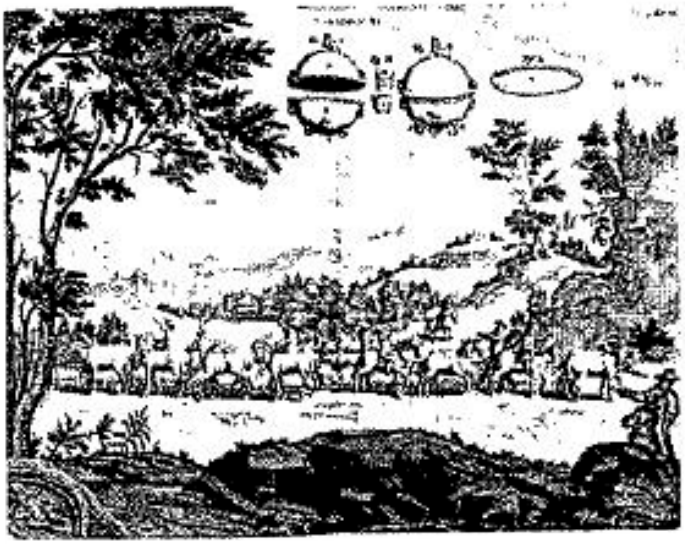
18. Observe this antique figure and answer the questions below:



How is this mechanical unit related to the SI unit of power?

A. 1H.P. = 756 W

B. 1H.P. = 764 W

C. 1 H.P. = 746W

D. None of the above

Answer: C

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19. The relationship to evaluate the velocity ratio is

A. velocity of effort/ velocity of load

B. displacement of effort / displacement of load

C. Mechanical advantage / efficiency

D. all of the above

Answer: D

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20. State which of the following statements are true.

A. Efficiency of an ideal machine is equal to one

B. Efficiency of a practical machine is less than one

C. Efficiency is always expressed in fraction

D. both 1 and 2

Answer: D

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21. A single fixed pulley is used because :

A. force multiplier

B. Torque multiplier

C. to achieve convenience of direction of force applied

D. none of the above

Answer: C

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22. A baseball player shown in the figure runs over the entire pitch to complete one run by hitting the baseball hard enough. Work done by the player is

A. 0J

B. 10J

C. 100J

D. 1000 J

Answer: A

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23. For an ideal echo to occur the medium must be

A. Elastic

B. Inertial

C. Frictionless

D. all of the above

Answer: D

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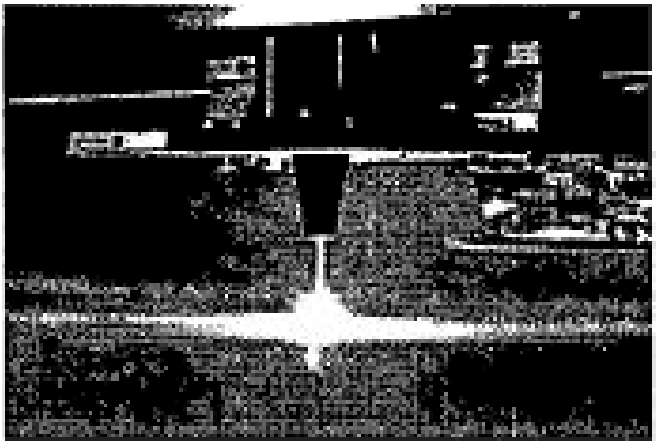
24. The diagram below shows a spherical lens used to focus a beam of laser in medical field. With reference to this answer the following questions:



The spherical lens used is

A. convex

B. convexo concave

C. concave

D. plano convex

Answer: A

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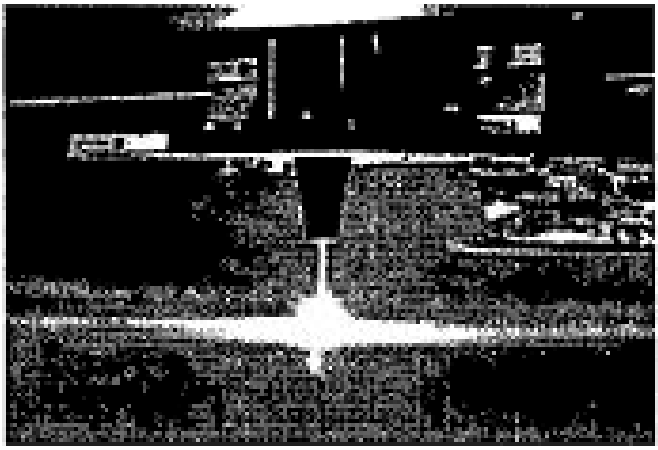
25. The diagram below shows a spherical lens used to focus a beam of laser in medical field. With reference to this answer the following questions:



The type of lens is

A. diverging

B. converging

C. neither converging

D. both converging and diverging

Answer: B

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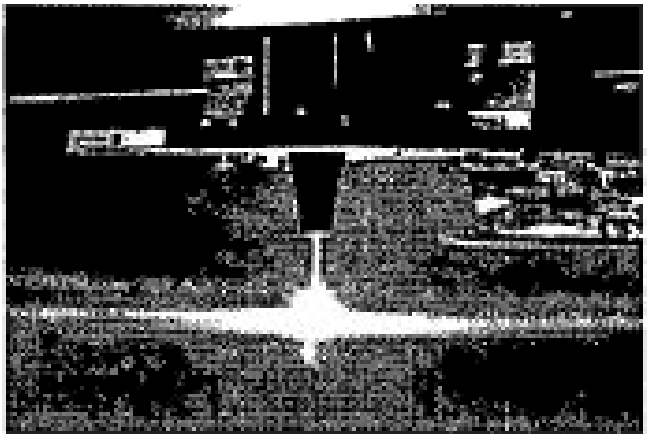
26. The diagram below shows a spherical lens used to focus a beam of laser in medical field. With reference to this answer the following

questions:



The power of such a lens is

A. positive

B. negative

C. zero

D. none of the above

Answer: A

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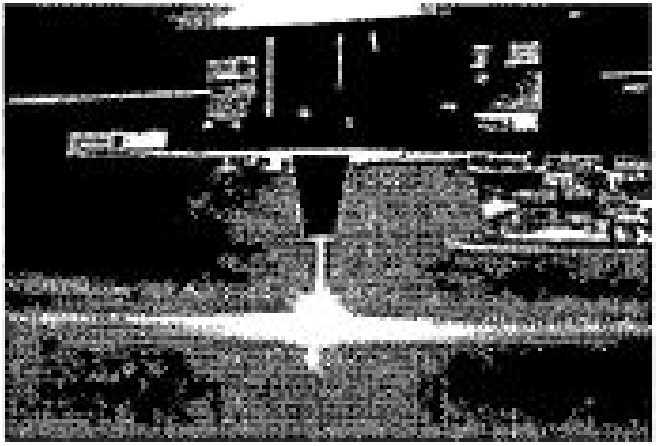
27. The diagram below shows a spherical lens used to focus a beam of laser in medical field. With reference to this answer the following questions:



If such a lens is dipped in benzene having less refractive index than glass.

A. The focal length would increase

B. The focal length is decrease

C. The focal length would be infinite

D. The focal length would be zero

Answer: A

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28. Select the correct reason for the cause that is responsible for mirage in deserts

A. It has a low critical angle

B. Due to total internal reflection.

C. Due to total internal reflection followed by successive refraction of light

D. Due to diffraction

Answer: C

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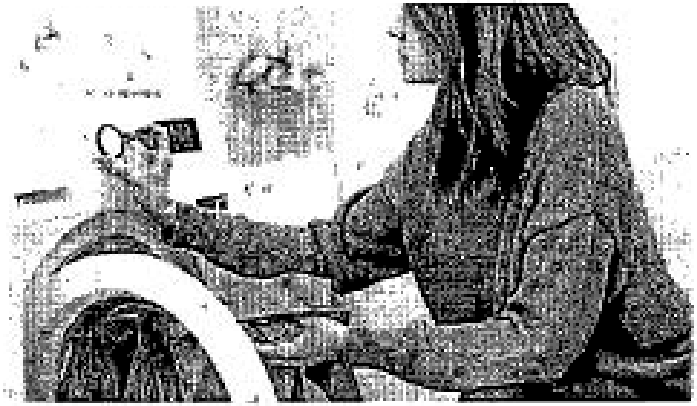
29. The energy transformation taking place in appliance shown below is



A. Mechanical energy to electrical energy

B. electrical energy to mechanical energy

C. Mechanical kinetic rotational energy to electrical energy

D. Electrical energy to Mechanical kinetic rotational energy

Answer: D

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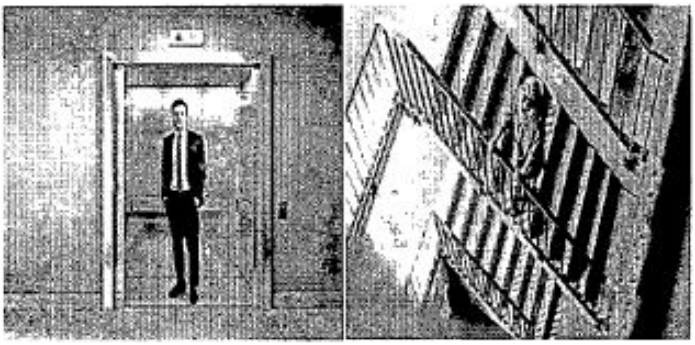
30. Aman reaches the 26th floor by using an elevator while a lady cimbs up a flight of stairs to reach the 26^{th} floor as shown in the figure



A. Both possess same gravitational potential energy on the 26^{th} floor

B. Both possess the same total energy at any instant of time

C. Both 1 and 2

D. Can't say

Answer: D

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31. Can a concave lens be used to burn a piece of paper.

(ii) What is its focal length and power if object is at infinite distance

A. (i) Yes (ii) Not defined

B. (i) No (ii) Apparent intersection of rays and power is (focal length)$^{-1}$

C. (i) Not sure (ii) Not defined

D. (i) None of the above (ii) all of the above

Answer: B

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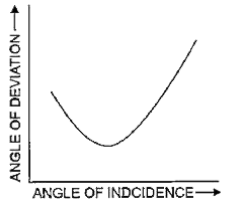
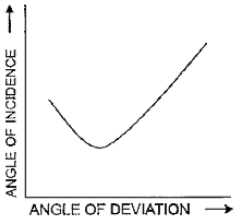
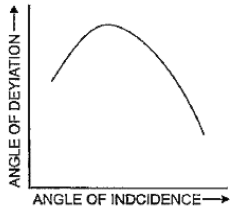
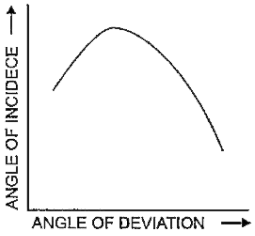
32. Which graph shows the correct variation of angle of incidence and angle of minimum deviation

A. 

B. 

C. 

D. 

Answer: A

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33. Minimum deviation position is possible in

A. Isosceles right-angled prism

B. Equiangular prism

C. Equilateral prism

D. all of the above

Answer: D

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34. The relation between angle of prism and minimum angular deviation is

A. angle of prism-angle of deviation

B. angle of prism is twice angle of deviation

C. angle of prism=2[angle of incidence] - angle of minimum deviation

D. angle of prism is half the angle of deviation

Answer: C

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35. The measure of angular deviation for a particular colour of light while passing

through a glass prism ------- with increase in wavelength

A. increases

B. decreases

C. remains same

D. none of the above

Answer: B

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