BIOLOGY

BOOKS - SURA BIOLOGY (TAMIL ENGLISH)

PROBLEMS-4 MARKS

Subjective Type Questions

1. A beam of light passing through a diverging lens of focal length 0.3 m appear to be

focused at a distance 0.2 m behind the lens.

Find the position of the object.

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2. A 100 watt bulb is used for 5 hours daily and four 60 watt bulbs are used for 5 hours daily. Calculate the energy consumed (in kWh) in the month of January.

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3. A source and listener are both moving towards each other with a speed v/10 where v is the speed of sound. If the frequency of the note emitted by the source is f, what will be the frequency heard by the listener?

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4. At $10°C$, how for away is a reflecting surface if you hear an echo in 0.274s? (speed of sound in air at $0°C$ is $331.3ms^{-1}$).

5. An object is placed at a distance 20 cm from a convex lens of focal length 10 cm . Find the image distance and nature of the image .

6. Keeping the temperature as constant, a gas is compressed four times of its initial pressure. The volume of gas in the container changing

from 20cc (V_1 cc) to V_2 cc. find the final volume V_2.

7. Calculate the number of atoms of oxygen and carbon in 5 moles of CO^2.

8. What would be the pH of an aqueous solution of sulphuric acid which is 5×10^{-5}

mol litre^{-1} in concentration.

9. Two bodies have a mass ratio of 3:4. The force applied on the bigger mass produces an acceleration of 12 ms^{-2}. What could be the acceleration of the other body , if the same force acts on it .

10. Three resistors of 1Ω, 2 Ω and 4Ω are connected in parallel in a circuit. If a 1Ω resistor draws a current of 1A, find the current through the other two resistors.

11. A source of sound is moving with a velocity of $50ms^{-1}$ towards a stationary listener. The listener measures the frequency of the source as 1000Hz. What will be the apparent

frequency of the source when it is moving away from the listener after crossing him? (velocity of sound in the medium is $330ms^{-1}$).

12. The solubility of sodium nitrate at $50°C$ and $30°C$ is 114g and 96g respectively. Find the amount of salt that will be thrown out when a saturated solution of sodium nitrate containing 50 g of water is cooled from $50°C$ to $30°C$?
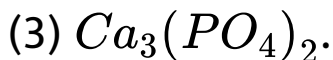
13. An object of height 3 cm is placed at 10 cm from a concave lens of focal length 15 cm. find the size of the image.

14. Calculate the gram molar mass of the following.

(1). H_2O

(2) CO_2

(3) $Ca_3(PO_4)_2$.

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15. A piece of steel has a length 2 m at 200K .

At 250 K its length increases by 0.1 m. Find the

coefficient of cubical expansion of steel.

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16. Calculate the amount of energy released when a radioactive substance undergoes fusion and results in a mass defect of 2 kg.

17. A container whose capacity is 70 ml is filled with a liquid up to 50 ml. then the liquid in the container is heated. Initially, the level of the liquid falls from 50 ml to 48.5 ml. then we heat

more, the level of the liquid rises to 51.2 ml. find the apparent and real expansion.

18. At what height from the center of the Earth the acceleration due to gravity will be 1/4th of its value as at the earth.

19. A solution is made from 35 ml of Methanol and 65 ml of water. Calculate the volume percentage.

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20. An electric iron consumes energy at the rate of 420 W when heating is at the maximum rate and 180 W when heating is at the minimum rate. The applied voltage is 220V. What is the current in each case.