



JSS INTERNATIONAL SCHOOL DUBAI

Practice papers 3 - By Salman Sir

80 marks

Full syllabus

2 Hours

SECTION-A

(Attempt all questions from this Section.)

Question 1. Choose the correct answers to the questions from the given options: [15]

(i) A body is acted upon by two unequal forces in opposite directions, but not in same line. The effect is that:

- (a) The body will have only the rotational motion
- (b) The body will have only the translational motion
- (c) The body will have neither the rotational motion nor the translational motion
- (d) The body will have rotational as well as translational motion

(ii) A pendulum is oscillating on either side of its mean position. The correct statement is:

- (a) It has only the kinetic energy at each position
- (b) It has the maximum kinetic energy at its extreme position
- (c) It has the maximum potential energy at its mean position
- (d) The sum of its kinetic and potential energy remains constant throughout the motion

(iii) A metal ball of mass 2 kg is allowed to fall freely from rest from a height of 5 m above the ground. What happens to the mechanical energy after the ball hits the ground and comes to rest?

- (a) Mechanical energy converts into sound energy
- (b) Mechanical energy converts into heat and sound energy
- (c) Mechanical energy converts into heat energy
- (d) None of the above

(iv) A radioactive element undergoes a gamma decay. Then the atomic number of the daughter nucleus:

- (a) decreases by two
- (b) increases by one
- (c) decreases by one
- (d) no change colour of the extreme

(v) In the spectrum of white light by a prism, the end opposite to the base of prism is:

- (a) Violet
- (b) Yellow
- (c) Red
- (d) Blue

(vi) In which of the following diagrams is the refraction not correct:

(vii) To detect the obstacles in their path, bats produce:

- (a) Infrasonic waves
- (b) Ultrasonic waves
- (c) Electromagnetic waves
- (d) Radio waves

(viii) Which is not the condition for the formation of echoes?

- (a) Minimum distance between the source of sound and reflecting body should be 17 m
- (b) The temperature of air should be above 20°C
- (c) The wavelength of sound should be less than the height of the reflecting body
- (d) The intensity of sound should be sufficient so that it could be heard after reflection

(ix) Two devices are connected between two points say A and B in parallel. The physical quantity that will remain the same between the two points is:

- (a) current
- (b) voltage
- (c) resistance
- (d) none of these

(x) From the power rating of any electrical appliance, we can find:

- (a) The resistance of the appliance
- (b) The safe limit of current which can flow through the appliance
- (c) Both (a) and (b)
- (d) None of these

(xi) A soft iron bar is introduced inside a current carrying solenoid. The magnetic field inside a solenoid:

- (a) Decrease
- (b) Will increase
- (c) Will become zero
- (d) Will remain unaffected

(xii) Consider two bodies (A, B) are put in contact. After sometime we observe that there is no flow of heat between two bodies. From this incident you can say that:

- (a) The temperature of body A is higher than B
- (b) The temperature of body B is higher than A
- (c) The two bodies have same temperature
- (d) You cannot say anything about the temperature

(xiii) Heat capacity per unit mass of a body is called:

- (a) Latent heat
- (b) Specific heat
- (c) Heat energy
- (d) None of these

- (xiv) The refractive index of a medium is 1.5. It means:
- (a) Light travels in the medium 1.5 times faster than in air
 - (b) Light travels in the air 1.5 times faster than in the medium
 - (c) Light travels in the air 3 times faster than in the medium
 - (d) None of these

(xv) Light travel fastest in:

- (a) Water
- (b) Air
- (c) Glass
- (d) Diamond

Question 2.

- (i) (a) How many pulleys are there in a movable block of a block and tackle system with velocity ratio 3?
- (b) A radioactive nucleus emits a gamma ray. Does the position of daughter nucleus change in a periodic table as compared to the parent nucleus?
- (c) To which electrically charged plate a gamma ray will deflect while passing through an electric field? [3]

(ii) A, B and C are three forces each of magnitude 4 N acting in the plane of paper as shown in the figure. The point O lies in the same plane. [2]

- (a) Which force has the least moment about O?
- (b) Which force has the greatest moment about O?

(iii) State the condition when a body is in

- (a) static equilibrium, (b) dynamic equilibrium. [2]

(iv) A wheel of diameter 2 m is shown in figure with axle at O. A force of 2 N is applied at B in the direction shown in figure. Calculate the moment of force about: [2]

- (a) centre O
- (b) point A.

(v) A force F acts on a body and displaces it by a distance S in a direction an angle θ with the direction of force.

- (a) Write the expression for the work done by the force.
- (b) What should be the angle between the force and displacement to get (1) zero (2) maximum work? [2]

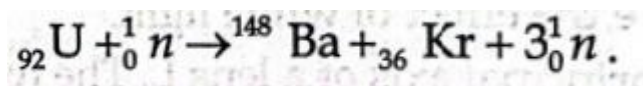
(vi) (a) Name the phenomenon involved in tuning a radio set to a particular station.

- (b) Define the phenomenon named by you in part (a) above. [2]

- (vii) (a) Sketch a graph to show the change in potential difference across the ends of an ohmic resistor and the current flowing in it. Label the axes of your graph.
 (b) What does the slope of the graph represent? [2]

Questions 3.

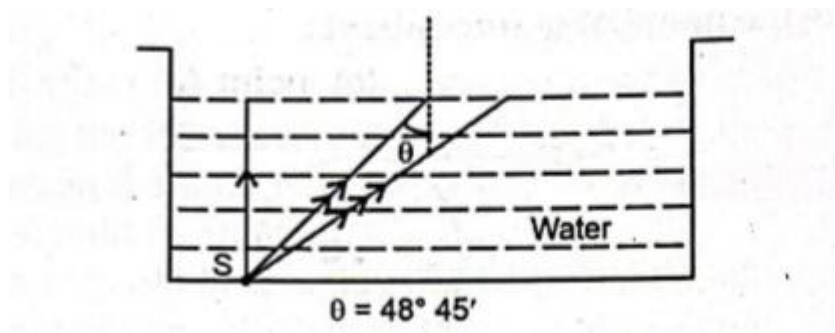
- (i) An object AB is placed in front of a convex lens as shown below. Copy the diagram and complete it to show the refraction of two rays emerging from the point B. Indicate the position and nature of the image formed. [2]
- (ii) (a) Is it possible to switch off an appliance by placing the switch in a neutral wire?
 (b) Is it possible for current to flow between a neutral and an earth wire? [2]
- (iii) How is the magnetic field around a straight conductor affected if:
 (a) current through the conductor is increased? (b) distance of the point of observation is increased? [2]
- (iv) A metal of mass 250 g is heated to a temperature of 65 °C. It is then placed in 50 g of water at 20 °C. The final steady temperature of water becomes 25 °C. Neglecting the heat taken by the container, calculate the specific heat capacity of the metal.[2]
- (b) What is nuclear fission? Complete the following reaction using the appropriate subscripts or superscripts where missing [2]



SECTION-B (Attempt any four questions.)

Question 4.

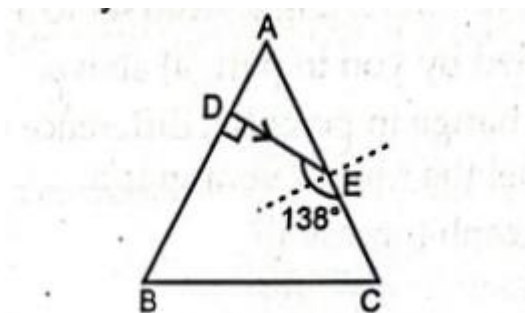
- (i) In the figure below a source of light S is placed at the bottom of a beaker containing water.
 (a) Copy the diagram and show the path of rays, marked with arrows after they meet the water air boundary.
 (b) Does the ray marked with one arrow, undergo refraction?
 (c) Name the phenomenon exhibited by ray marked with three arrows. [3]



(ii) The critical angle for the glass which the equilateral prism ABC is made of is 48° . A ray of light incident on the side AB of the prism is refracted along DE such that the angle it makes with the side AC is 138° as shown in figure below. Also, angle $EDB = 90^\circ$. Copy the diagram.

(a) Draw the path of ray incident on the side AB (which travels along DE).

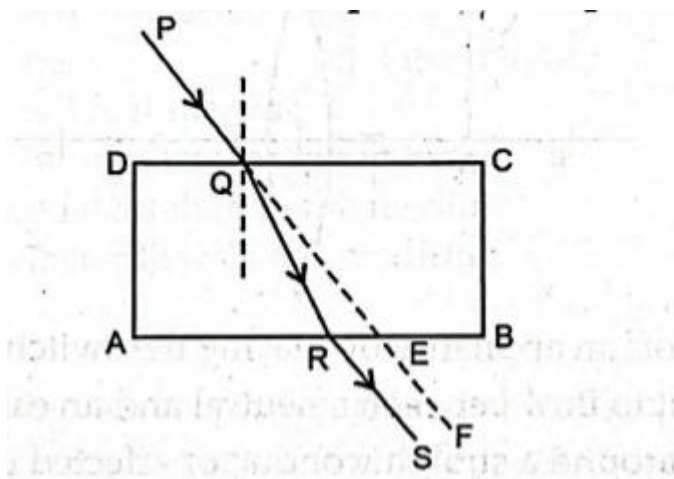
(b) Show the path along which the ray DE travels from point E onwards through the side BC. [3]



(iii) Figure below shows the refraction and emergence of a ray of light incident on a rectangular glass slab, Copy the diagram.

(a) Mark the lateral displacement of the incident ray.

(b) Name the two factors on which the lateral displacement depends. [4]



Question 5.

(i) An object is placed in front of a lens between its optical centre and focus. The image formed is virtual, erect and diminished.

(a) Name the lens which forms this image.

(b) Draw a ray diagram to show the formation of an image with the above characteristics. [3]

(ii) Draw a diagram to show that white light can be split up into different colours. Draw another diagram to show how the colours can be combined to give the effect of white light. [3]

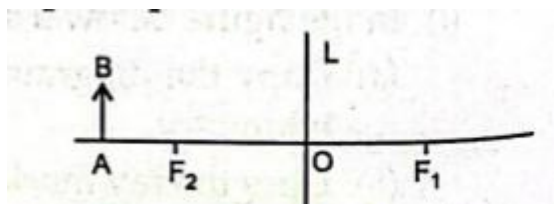
(iii) Figure below shows an object AB placed on the principal axis of a lens L. The two foci of the lens are F_1 and F_2 . The image formed by the lens is erect, virtual and diminished. Copy the diagram and answer the following questions:

(a) Draw the outline of lens (L) used.

(b) Draw a ray from B, and passing through O. Show the ray after refraction by the lens.

(c) Draw a ray of light starting from B, which after passing parallel to the principal axis, is incident on the lens and emerges after refraction from it.

(d) Locate the final image formed. [4]

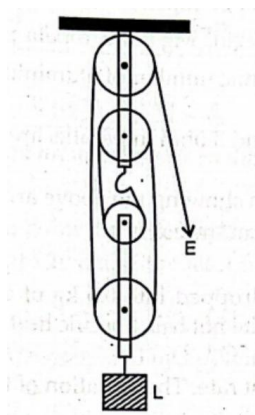


Question 6.

(1) Figure given below shows an arrangement of four pulleys. A load L is attached to the movable lower block and an effort E is applied at the free end of the string. Copy the diagram and:

(a) Draw arrows to indicate tension in each part of the string.

(b) Calculate the mechanical advantage of the system. Assume pulleys to be weightless. [3]



(ii) A uniform metre rule of mass 100 g is balanced on a fulcrum at mark 40 cm by suspending an unknown mass m at the 20 cm mark.

(a) Find the value of m .

(b) To which side the rule will tilt if the mass m is moved to the 10000 cm mark?

(c) What is the resultant moment now? [3]

(iii) A stone of mass 64.0 g is thrown vertically upward from the ground with an initial speed of 20.0 m/s. The gravitational potential energy at the ground level is considered to be zero. Apply the principle of conservation of energy and:

(a) Calculate the potential energy at the maximum height attained by the stone. ($g = 10 \text{ ms}^{-2}$)

(b) Using the same principle, state what will be the total energy of the body at its halfway point? [4]

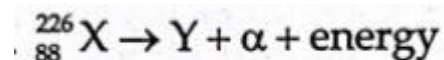
Question 7.

(1) A man standing in front of a vertical cliff fires a gun. He hears the echo after 3 seconds. On moving closer to the cliff by 82.5 m, he fires again. This time, he hears the echo after 2.5 seconds. Calculate:

(a) the distance of the cliff from the initial position of the man.

(b) the velocity of sound. [3]

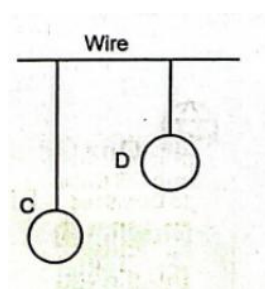
(ii) In the nuclear reaction given below, a nucleus X changes to another nucleus Y .



- (a) What are the atomic number and mass number of Y?
- (b) Name the gas formed when alpha particle acquires two electrons.
- (c) What is the effect on the motion of alpha particles when it passes through a region containing a magnetic field? [3]

(iii) Two pendulums C and D are suspended from a wire as shown in the figure. Pendulum C is made to oscillate by displacing it from its mean position. It is seen that D also starts oscillating.

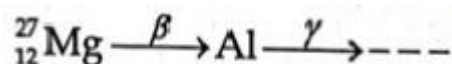
- (a) Name the type of oscillation, C will execute.
- (b) Name the type of oscillation, D will execute.
- (c) If the length of D is made equal to C, then what difference will you notice in the oscillations of D?
- (d) What is the name of the phenomenon when the length of D is made equal to C? [4]



Question 8.

- (i) There are three pins in an electric plug top. Answer the following:
 - (a) How would you identify the earth pin?
 - (b) In which of the three connecting wires should the electric switch be connected?
 - (c) Explain why a switch should not be touched with wet hands. [3]

(ii) In reaction



- (a) ${}_{12}^{27}\text{Mg}$ emits a beta particle and is transformed into aluminium, Write the mass number and the atomic number of aluminium.
 - (b) aluminium emits a gamma-ray. What is the resulting nucleus? [3]
- (iii) Two resistors of resistance 2 ohm and 3 ohm in parallel are connected to a cell of emf 1.5 V and internal resistance 0.3 ohm.
- (a) Draw a labelled circuit diagram showing the above arrangement.
 - (b) Calculate the current drawn from the cell. [4]

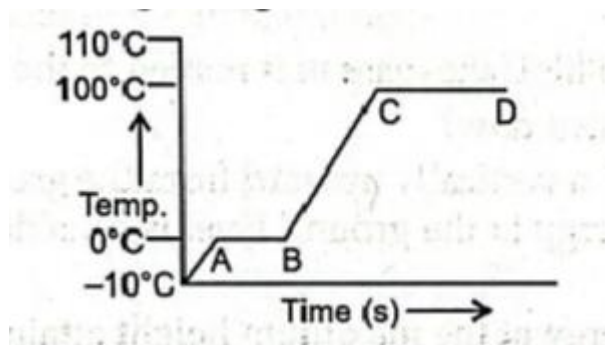
Question 9.

(i) A hot iron ball of mass 0.2 kg is dropped into 0.5 kg of water at 10°C . The resulting temperature is 30°C . Calculate the temperature of the hot ball. Specific heat capacity of iron = $336 \text{ J/Kg } ^{\circ}\text{C}$ and specific heat capacity of water = $4200 \text{ J kg}^{-1} ^{\circ}\text{C}^{-1}$ [3]

(ii) A piece of ice is heated at a constant rate. The variation of temperature with heat input is shown in the graph:

(a) What are represented by AB and CD?

(b) What conclusion can you draw regarding the nature of ice from the graph? [3]



(iii) (a) What name is given to a cylindrical coil of diameter less than its length?

(b) If a piece of soft iron is placed inside the coil mentioned in part (a) and current is passed in the coil from a battery, what name is then given to the device so obtained?

(c) Give one use of the device mentioned in part (b). [4]