NEW STANDARD ACADEMY

Marks: 80

Date : 20-08-24   CLASS : 09ᵀᴴ   Time: 3 HRS

PHYSICS

1. Suppose you and your friend have mass 60 kg each. Suppose also that both of you are standing such that your centres of gravity are 2 m apart. Calculate the force of gravitation between you and your friend. Calculate also the force of gravity acting on you.(Take $G = 6.67 \times 10^{-11}$ Nm^{-2}/kg^2, g $= 9.8 = $ ms^{-2})

2. A body weight is 63 N on the surface of the earth. What is the gravitational force on it due to the earth. Mass of the earth = 6×10^{24} kg and radius of the earth = 6.4×10^6 m. The distance of the body from the surface of earth is equal to half the radius of earth

3. Define 'acceleration due to gravity of earth'. Does the acceleration produced in a freely falling body depend on the mass of the body? Justify your answer mathematically.

4. What are the differences between the mass of an object and its weight?

5. (i) Is the acceleration due to gravity of earth 'g' always a constant at every place ? Discuss.
   (ii) During a free fall, will heavier objects accelerate more than lighter ones? Give reason for your answer.

6. Calculate the force of gravitation between two objects of masses 50 kg and 120 kg respectively, kept at a distance of 10 m from each other. ($G = 6.673 \times 10^{-11}$ Nm² kg^{-2})

7. A ball is dropped from the top of a tower of height h. What time does it take to reach the ground? What will be its speed at the time of striking the ground?

8. (i) How is the force of attraction dependent on the masses of objects and distance between them? (ii) The mass of earth is 6×10^{24} kg and that of a natural satellite is 6.5×10^{20} kg. If the distance between them is 3.35×10^6 km, calculate the force exerted by earth on it.
   [G=6.7×10^{-11} Nm² kg^{-2}]

9. (a) Differentiate between 'G' and 'g'.
   (b) How does the gravitational force between two objects change if distance between them tripled?

10. (a) An object has mass 1 kg and weight 1.67 N on moon. Calculate its weight and mass on earth. (g = 10 m/s²)

CHEMISTRY

1. What are the characteristics of pure and impure substances ? Explain with examples.

2. What are homogeneous and heterogeneous solutions? Explain with examples.

3. Give examples of gaseous solutions , liquid solutions and solid solutions.

4. A solution contains 20 mL methanol , 30 mL ethanol and 50 mL of acetone . What is the valume percentage of each constituent?

5. 20 grams of a solute are present in 100 grams of water. What is the mass percentage of solute in the solution?

6. Mass of saturated solution is 120 gram .The solution is evaporated to dryness. The residue life is 20 gram.Calculate the solubility of the solute.

7. What are saturated and unsaturated solutions?

8. What is the effect of temperature on the (a) solubility of a gas in a liquid (b) solubility of KOH in water (c) solubility of NaCl or glucose in water

9. What is the effect of pressure on the solubility of a gas in a liquid at constant temperature?

10. Calculate the mass of sodium sulphate required to prepare its 20% (Mass per cent) solution in 100 gram in water.


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BIOLOGY

1. Where are proteins synthesized inside the cell?
2. Which organelle is known as the power house of the cell ? why?
3. Name any cell organelle which is non – membranous.
4. Write the names of different plant parts in which chromoplast, chloroplast and leucoplast are present.
5. Name the two organelles in a plant cell that contain their own genetic material and ribosomes.
6. Draw a neat labeled diagram of an eukaryotic cell.
7. Name the term for the fluid substance of the cell.
8. What are organelles?
9. What is the role of DNA and ribosome in mitochondria?
10. What is function of mitochondria?

MATHS

1. In the adjoining figure ,OA =OB and OD=OC.
   Show that
   (i) $\Delta AOD \cong \Delta BOC$
   (ii) AD∥ CB
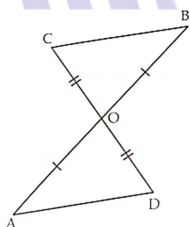
2. In right triangle ABC, right angled at C, M is mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B.
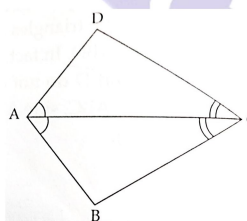   Show that
   (i) ΔAMC = ΔBMD
   (ii) ∠DBC is a right angle
   (iii) ΔDBC = ΔACB
   (iv) CM = $\frac{1}{2}$ AB
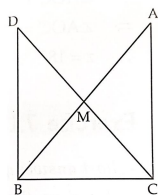
3. . In the adjoining figure, AB = CD CE = BF and ∠ ACE = ∠ DBF. Prove that
   (i) ΔACE ≅ ΔDBF
   (ii) AE = DF
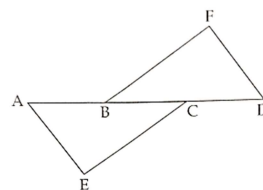
4. ABCD is a quadrilateral such that diagonal Ac bisects the angles A and C. Prove that AB=AD and CB=CD.

5. In the adjoining figure, AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that angle ∠BAD = ∠ABE and∠ EPA = ∠DPB Show that
   (i) Δ DAP ≅ ΔLBP
   (ii) AD = BE
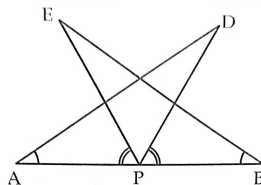
6. In triangles ABC and PQR, ∠A = ∠Q and ∠B = ∠R. Which side of APQR should be equal to side BC of ΔABC so that the two triangles are congruent? Give reason for your answer

7. In the figure given below, AB II CD. Find the values of x, y and z. /
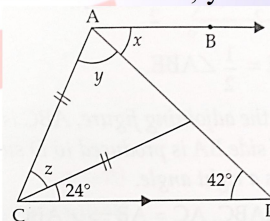
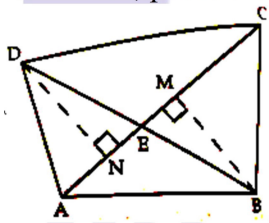8. In the figure given below, CDE is an equilateral triangle formed on a side CD of a square ABCD. Show that
   (i) Δ ADE ≅ ΔBCE
   (ii) AEB is an isosceles triangle
   (iii) ∠EAB = 75^0
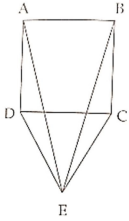
9. In the adjoining figure, AD and BC are equal perpendiculars to a line segment AB. Show that CD bisects AB.
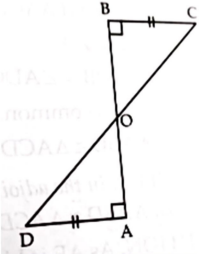
10. In the adjoining figure, BM and DN are perpendiculars to the line segment AC. If BM = DN, prove that AC bisects BD.