THE LEARNINGFIELD SECONDARY SCHOOL



**Close 30, Satellite Town, Lagos state.**

**FIRST TERM EXAMINATION 2013/2014 SESSION**

**SUBJECT: PHYSICS**

**CLASS: SSS 2 TIME: 2HRS 30 MIN**

**ATTEMPT ALL QUESTIONS**

**SUBJECT: PHYSICS CLASS: SS 3 TIME: 2½**

1. What is the density of a fuel of relative density 0.72? (density of water = 1000Kg/m³) (a) 72 Kg/m³ (b) 720 Kg/m³ (c) 7200 Kg/m³ (d) 72000 Kg/m³
2. Which one of the following instruments is the best for measuring the diameter of thin constantan wire? (a) calipers (b) meter rule (c) micrometer screw gauge (d) vernier calipers
3. Two cars X and Y traveling in opposite directions along the same highway at uniform velocities 110Km/h and 90Km/h respectively pass each other at a certain point. The velocity of X relative to Y at the time they pass each other is (a) 200Km/h (b) 100 Km/h (c) 40 Km/h (d) 20 Km/h.
4. A body is projected horizontally fro the top of a cliff 45m above the ground. If the body lands at a distance 30m from the foot of the cliff, calculate the speed of projection. (g = 10m/s²) (a) 10 m/s (b) 15 m/s (c) 20 m/s (d) 30 m/s
5. A simple harmonic oscillator has a period of 0.02s and amplitude of 0.25m. Calculate the speed in m/s at the centre of oscillation (a) 1.25π (b) 25.0π (c) 100.0π (d) 400π
6. A machine is said to be a third class lever when the (a) load is between the fulcrum and effort (b) fulcrum is between the effort and load. (c) effort is between the fulcrum and load (d) fulcrum
7. A thermometer records 680mmHg at the steam point and 440mmHg at the ice point. The temperature it records at 380mmHg is (a) -25˚C (b) -20˚C (c) 20˚C (d) 25˚C
8. In a thermo flask, heat loss by radiation is minimized by the (a) silvered surface (b) vacuum within the double walls (c) plastic stopper (d) cork support
9. An electric drill rate 400W is used to drill a hole in copper of mass 400g in 20s. Calculate the rise in temperature if all the heat produced is absorbed by the copper (specific heat capacity of copper = 400J/KgK) (a)100˚C (b) 75˚C (c) 50˚C (d) 45˚C
10. Dew point is not affected by (a) temperature (b) wind (c) the amount of water vapour in the atmosphere (d) atmospheric pressure
11. A certain wave has a speed of 20m/s. If the frequency of the wave is 0.25Hz, Calculate the

distance between successive crests of the wave (a) 5m (b) 40m (c) 50m (d) 80m.

12. The ability of a wave to spread around corners is called (a) polarization (b) dispersion (c) diffraction (d) reflection.

13. The following devices use plane mirrors in their operations, except (a) periscope (b) sextant (c) kaleidoscope (d) binoculars.

14. A lens that is thinner at the middle and thicker at the edge is (a) diverging (b) converging (c) Plano-convex (d) Plano-concave.

15. Which of the following electromagnetic waves has the longest wavelength (a) radio waves (b) gamma rays (c) infra-red waves (d) ultraviolet rays.

16. A positively charged glass rod is placed the cap of a positively charged electroscope. The divergence of the leaf is observed to (a) decrease (b) increase (c) remain the same (d) increase and collapse immediately.

17. Capacitors are used in the following devices except (a) water pumping machine (b) ceiling fan (c) electric irons (d) television sets.

18. A galvanometer of internal resistance 50Ω and a full scale deflection of 20mA is converted into a voltmeter by connecting a resistor of resistance 1950Ω in series with it. Calculate the maximum voltage that can read by the voltameter. (a) 20V (b) 30V (c) 38V(d) 40V.

19. Which of the following factors will increase the sensitivity of a moving coil meter? (a) strong spring (b)low number of turns (c) small area of coil (d) soft iron core.

20. Which of the following factors does not affect the electric resistance of a wire? (a) length (b) mass (c) temperature (d) cross sectional area.

21. The resonant frequency of an a.c circuit is 100 KHz. If each of the capacitance and inductance in the circuit is reduced by 50% and no other changes are made, the resonant frequency will become (a) 250 KHz (b) 750 KHz (c) 1000 KHz (d) 2000 KHz.

22. Oxidation of the filament in a light bulb is prevented by the introduction of (a) hydrogen (b) oxygen (c) argon (d) mercury.

23. Eddy currents can be reduced by (a) laminating the core (b) winding the coil on a soft iron core (c) creating holes in the metal plates (d) using coil of low resistance.

24. Neutrons are used to induced artificial radioactivity because they (a) are energetic (b) have no charged (c) have no mass (d) are ionizing.

25. A car travelling at a uniform speed of 120Kmh⁻¹ passes two stations in 4 minutes. Calculate the distance between the two stations. (a) 4Km (b) 8Km (c) 10Km (d) 30Km.

26. The force of 100N is inclined at 60˚ to the vertical. What is the vertical component of the force? (a) 80N (b) 60√3N (c) 50√3N (d) 50N

27. In which of the following simple machines is effort applied between the load and the fulcrum (a) Pliers (b) Scissors (c) Sugar tongs (d) Table knife.

28. A body of mass 10Kg moving with a speed of 40ms⁻¹ is brought to rest in 5.0s by a constant retarding force. Calculate the magnitude of the force. (a) 140N (b) 120N (c) 100N (d) 80N

29. A Celsius thermometer reads 30˚C. What will be its equivalent reading in Kelvin (a) 100 (b) 130 (c) 273 (d) 303

30. Which of the following instruments ha its action based on expansion of different metals (a) Hydrometer (b) Hygrometer (c) Thermocouple (d) Thermostat

31. Calculate the quantity of heat that will be liberated when 3g of mercury vapour condenses. (Latent heat of vaporization = 273Jg⁻¹) (a) 819J (b) 540J (c ) 276J (d) 270J

32. An object 0.12m tall is placed at a distance of 36cm in front of a pin hole camera. If its image is formed on a screen 30cm behind the pinhole, calculate the height of the image. (a) 1.00m (b) 0.50m (c) 0.35m (d) 0.10m

33. A ray of light strikes a plane mirror at a glancing angle of 50˚. Calculate the angle between the incident and the reflected rays. (a) 100˚ (b) 80˚ (c) 50˚ (d) 30˚

34. A boy blew a whistle on a cool quiet night and heard the echo 4s later. At what distance from the boy is the reflecting surface (a) 680m (b) 850m (c) 1020m (d) 1190m

35. Calculate the magnitude of the escape velocity of a satellite from the earth’s gravitational field. (g = 9.8ms⁻², radius of the earth = 6.4 x 10³Km) (a) 1.4 x 10⁴ms⁻¹ (b) 2.4 x 10⁴ms⁻¹ (c) 3.0 x 10⁴ms⁻¹ (d) 3.6 x 10ms⁻¹

36. The force of attraction between two equal but opposite charges is 1.30N. If the magnitude is 3 x 10⁻⁶ C, calculate the distance between them. ( k = 9 x 10⁹Nm²C⁻²) (a) 0.06m (b) 0.08m (c) 0.25m (d) 12.00m

37. Two resistors of resistances 2Ω and 4Ω are connected in series, and then in parallel. What is the ratio of their effective resistances (a) 1:3 (b) 3:2 (c) 4:5 (d) 9:2

38. Calculate the heat in joules produced in an electric coil of resistance 12Ω when a current of 2A is passed through it for 20minutes. (a) 5.76 x 10⁴ (b) 4.57 x 10⁴ (c) 2.44 x 10⁴ (d) 2.28 x 10⁴

39. Which of the following has the greatest viscosity (a) Alcohol (b) Kerosene (c) Methylated spirit (d) paraffin oil

40. The angle of magnetic and geographic meridian at a place on the earth’s surface is called the (a) angle of declination (b) angle of dip (c) angle of inclination (d) longititude.

**THEORY**

**SECTION B: ANSWER ANY 3 QUESTIONS FROM THIS SECTION.**

1. A satellite of mass 2400kg is placed in an orbit at a distance r = 4.23 x 10⁷m from the centre of the earth. Mass of the earth = 6 x10²⁴kg, G= 6.67 x 10 ̄¹¹Nm²/kg². Calculate (i) angular velocity (ii) period of the satellite’s orbit (iii) speed of the satellite (iv) acceleration (v) force of attraction between the earth and the satellite.
2. (a) Define the following (i) electrolysis (ii) electrolyte (b) Three point charges that lie in the x, y planes in a vacuum are shown in the diagram. Determine the magnitude and the direction of the electrostatic force on Q₁
3. (a)(i) Name and explain the common defects of a primary cell (ii) State two advantages two advantages of a secondary cell over a primary cell. (b) Name the materials used for the positive terminal, the negative terminal and the electrolyte in a (i) Leclanche cell (ii) Charged lead acid accumulator.
4. The plates of a parallel plate capacitor, 5 x 10⁻³m apart are maintained at a potential difference of 5.0 x 10⁴V. Calculate the magnitude of the (i) electric field intensity (ii) force on the electron (iii) acceleration of the electron (electron charge = 1.60 x 10⁻¹⁹C, mass of electron = 9.1 x 10⁻³¹Kg).
5. (a)(i) State Maxwell’s Corkscrew rule. (ii) list three way of making magnet and briefly explain one (iii)list three method of demagnetization and briefly explain any one. (b) With the aid of a diagram explain the working principle of either the electric bell or the telephone earpiece.