Unit 4 Long Questions.

1). Explain what is meant by momentum.

2). Explain what is meant by the principle of conservation of momentum.

3). Explain what is meant by Impulse.

4). Explain how N2 and N3 relate to momentum.

5). Explain the relationship between work and energy.

6). Explain the principle of conservation of energy.

7). Explain what is meant by an elastic collision.

8). Explain what is meant by an inelastic collision.

9). Explain how to apply conservation of momentum when two objects collide off-centre.

10). Explain what is meant by angular velocity.

11). Explain what is meant by angular displacement.

12). Explain what is meant by centripetal force.

13). Explain how a satellite is able to orbit the earth.

14). A bucket of water is swung vertically in a circle. Explain why the water does not fall out of the bucket if it is swung with sufficient velocity.

15). Explain what is meant by a 'field' in Physics.

16). Explain what is meant by Electric Field Strength.

17). Explain what is meant by a uniform field.

18). Explain what is meant by equipotential lines and surfaces.

19). Describe the electric field around a point charge.

20). Describe the electric field between two parallel plates.

21). Explain what is meant by a potential gradient.

22). Explain what is meant by an electric dipole.

23). Explain what happens when an electric dipole is placed in an electric field.

Give an example of a practical application.

24). Explain how you would attempt to demonstrate Coulomb's Law.

25). What is a capacitor?

26). Explain what is meant by electric charge.

27). Explain how to measure the capacitance of a capacitor.

28). Describe how the voltage across a capacitor changes with time when charging and discharging through a resistor.

29). Explain what is meant by a magnetic field.

30). Explain what is meant by a magnetic line of force.

31). Explain what is meant by a neutral point.

32). Explain how to determine the direction of the magnetic field around a current carrying wire.

33). Explain what is meant by magnetic flux density.

34). Explain what is meant by magnetic flux.

35). Explain how to determine the direction of the force acting on a current carrying conductor in a magnetic field.

36). Explain how to measure the force on a current carrying conductor in a magnetic field.

37). Explain how a d.c. electric motor works.

38). Explain what is meant by the Hall effect.

39). Describe the path followed by a beam of charged particles moving in a uniform magnetic field.

40). State and explain Faraday's law of electromagnetic induction.

41). State and explain Lenz's law.

42). A bar magnet is dropped vertically through a coil of wire. Describe how the voltage induced in the coil changes with time.

43). Describe a transformer and explain how it works.

44). Explain what is meant by the term nucleon.

45). Explain how Rutherford's alpha particle scattering experiment led to the nuclear model of the atom.

46). Explain how you would demonstrate that alpha particles are helium nuclei.

47). Explain what is meant by thermionic emission.

48). Describe a cyclotron and explain how it works.

49). Describe a linear particle accelerator / lineac and explain how it works.

50). Describe a cloud chamber and explain how it works.

51). Describe a bubble chamber and explain how it works.

52). Describe a drift chamber and explain how it works.

53). Explain how the track formed in a cloud chamber by a particle enables the properties of the particle to be determined.

54). Explain the principle of the conservation of mass-energy.

55). What is a quark?

56). Explain what is meant by pair production/annihilation and give an example of each.

57). Explain the concepts behind the standard model of matter.

58). What are Leptons and give two examples?

59). What are Hadrons and give two examples?

60). What are Baryons and give two examples?

61). What are Mesons and give two examples?

62). Explain what is meant by wave-particle duality, and give two examples.

63). Explain what is meant by the lepton conservation rule and give an example.

64). Explain what is meant by the baryon conservation rule and give an example.

65). What is a neutrino and explain how they were discovered?