SUBJECT: GENERAL PAPER

1. A deficiency of vitamin B, (thiamine) in the diet of a child can lead to .....
(a) goiter (b) beri-beri (c) scurvy (d) pellagra

2. Which of the following is not a component of guard cells?
(a) Chloroplasts (b) Nucleus (c) thin inner wall (d) rough spike

3. The enzyme of the glycolytic pathway is located in the.....
(a) mitochondria (b) golgi apparatus (c) cytoplasm (d) nucleus

4. Light is required in photosynthesis to .....
(a) oxidize water molecules (b) split water molecules (c) reduce carbon (IV) oxide (d) fix carbon (IV) oxide

5. The diploid number of chromosome in man is .....
(a) 46 (b) 23 (c) 48 (d) 26

6. The following are parts of the continental shelf of the marine habitat except.....
(a) splash zone (b) subtidal zone (c) intertidal zone (d) benthic zone

7. The part of the brain responsible for the coordination of involuntary actions such as heart beat, peristalsis is..... (a) medulla oblongata (b) cerebellum (c) pineal (d) cerebrum

8. When a velocity-time graph is a curve, it means that we have .....
(a) a uniform acceleration (b) a non-uniform acceleration (c) a uniform velocity (d) a non-uniform velocity

9. A ball of mass 1kg falls from a height of 3m and rebounds to a height of 2m after striking a horizontal surface. Calculate the loss in energy due to the impact. [Take $g = 10ms^{-2}$].
(a) 100 J (b) 50 J (c) 10 J (d) 1 J

10. A projectile attains a maximum range of 40m when $g = 10m/s^2$. Calculate its velocity of projection.
(a) $400ms^{-1}$ (b) $80ms^{-1}$ (c) $20ms^{-1}$ (d) $10ms^{-1}$

11. A ball of mass 10kg strikes a wall normally with a velocity of $5ms^{-1}$ and travels back with same velocity. Calculate its impulse on the wall.
(a) 0 (b) $25ms^{-1}$ (c) $50ms^{-1}$ (d) $100kgms^{-1}$

12. Calculate the velocity of the wave represented by the following wave equation $y = 20\sin(60\pi x - 0.5\pi x)$
If all the distances are in metres
(a) $30ms^{-1}$ (b) $60ms^{-1}$ (c) $80ms^{-1}$ (d) $120ms^{-1}$

13. The following are stringed instruments except
(a) violin (b) piano (c) guitar (d) xylophone

14. If two $2\mu F$ capacitors are connected in parallel with each other and the combination is then connected in series with a $4\mu F$ capacitor, the net capacitance will be.....
(a) $6.0\mu F$ (b) $4.0\mu F$ (c) $2.0\mu F$ (d) $0.2\mu F$

15. The limiting frictional force on a body of mass 4kg resting on an inclined plane is 20N. What is the angle of inclination θ on the plane?
(a) 75° (b) 60° (c) 45° (d) 30°

16. Which of the following quantities has the same unit as the product of pressure and volume of a gas?
(a) Power (b) Acceleration (c) Workdone (d) Force

17. Given a body undergoing circular motion with angular velocity, ω rad/s, and radius r m. Suppose the body has a mass, m kg. Then it will experience a centripetal force F of the form

(a) $m\omega r^2$ (b) $m\omega^2 r$ (c) $m\omega^2 r^2$ (d) $m\omega^{-1} r^2$

18. What is the efficiency of a cell with internal resistance of 3Ω, when it supplies current to a 7Ω resistor?
(a) 70% (b) 30% (c) 20% (d) 10%

19. Which of the following compounds is not obtained by polymerization?
(a) Plastic (b) Polythene (c) Petroleum (d) Cellulose

20. A specimen of zinc contained zinc oxide. 0.80g of this specimen reacted with acid to give 215cm^3 of hydrogen collected dry at 17°C and 770mmHg. Calculate the percentage of zinc oxide in the mixture. [32.5g = Zn, 1g = H].
(a) 15% (b) 25% (c) 35% (d) 45%

21. A measure of the degree of disorderliness in a chemical system is known as .....
(a) enthalpy (b) entropy (c) free energy (d) activation energy

22. $Cr_2O_7^{2-} + 6Fe^{2+} \rightarrow 2Cr^{3+} + 6Fe^{3+} + 7H_2O$
In the equation above, the oxidation number of chromium changes from
(a) +7 to +3 (b) +6 to +3 (c) -6 to +3 (d) -2 to +6

23. Which of the following metals will dissolve in aqueous sodium hydroxide?
(a) Calcium (b) Copper (c) Aluminum (d) Iron

24. The component elements present in the alloy used for welding and plumbing are .....
(a) lead and tin (b) lead and antimony (c) iron and aluminium (d) copper and tin

25. 15cm^3 of a gaseous hydrocarbon required for the complete combustion of 75cm^3 of oxygen and yielded 45cm^3 of carbon (IV) oxide. Calculate the molecular formula of the hydrocarbon.
(a) CH_4 (b) C_2H_6 (c) C_3H_8 (d) C_4H_{10}

26. Which of the following reagents can be used to differentiate alkanals from alkanones?
(a) Hydrogen cyanide (b) Sodium hydrogentrioxocarbonate (IV) (c) Fehling's reagent
(d) 2,4-dinitrophenylhydrazine

27. The products of photochlorination of ethanoic acid are .....
(a) $CH_3COOCl + HCl$ (b) $CH_3COCl + HOCl$ (c) $ClCH_2COCl + HCl$ (d) $ClCH_2COOH + HCl$

28. What are the products of the reaction between ethyl ethanoate and ammonia .....
(a) Aminoethane and ethanol (b) Aminomethane and propan-1-ol (c) Ethanamde and ethanol
(d) Methanamide and propan-1-ol

29. Effervescence occurs when water comes in contact with .....
(a) calcium (b) copper (c) sulphur (d) lead

30. Charring of sugar occurs when it is
(a) reduced (b) hydrolysed (c) dehydrated (d) fermented

31. How many moles of zinc would be deposited by passing 3F of electricity through a solution of $ZnSO_4$? [1F = 96500C]
(a) 1.5 moles (b) 2.3 moles (c) 3.4 moles (d) 0.15m

32. The colours seen in a rainbow are due to .....
(a) Polarization (b) absorption (c) refraction (d) interference

33. Coulomb's law for the electric force between two unlike charges each of magnitude q, separated by a distance x in air of permittivity can be written as

(a) $F = \frac{q^2}{4\pi\varepsilon_0 x}$ (b) $F = -\frac{q^2}{4\pi\varepsilon_0 x}$ (c) $F = \frac{q^2}{4\pi\varepsilon_0 x^2}$ (d) $F = -\frac{q^2}{4\pi\varepsilon_0 x^2}$

34. The operation of a moving-coil galvanometer is based on.....
(a) electromagnetic induction (b) magnetic effect of electric current (c) force on a current-carrying conductor in a magnetic field (d) electrochemical effect

35. In a series *R-L-C* circuit, the current indicated by the ammeter is *I*. If X_L and X_C are the inductive reactance and capacitive reactance, respectively, and *R* is the resistance, then the expression for the power consumed in the circuit is:
(a) $I^2\sqrt{R^2 + (X_L - X_C)^2}$ (b) $I^2\sqrt{R^2 + X^2_L - X_C)^2}$ (c) $I^2(R + X_L - X_C)$ (d) I^2R

36. The following are common to anaerobic respiration EXCEPT
(a) The by-products are water and carbon dioxide (b) Oxygen is not required for oxidation
(c) The by-products are alcohols or lactic acid (d) It takes place in the cytoplasm

37. Which of the following life processes does not involve meiotic cell division?
(a) Cell division in the tip of the root or cambium cells (b) Oogenesis (c) Spermatogenesis
(d) Formation of pollens in flowering plants

38. Which of the following organisms possesses the homodont dentition?
(a) Agama lizard (b) Rat (c) Cat (d) Man

39. The functional unit of the kidney is the .....
(a) Henle's loop (b) bowman's capsule (c) nephron (d) glomerulus

40. If the population of secondary consumers in a food web decreases what will happen to the population of the producers?
(a) They will decrease because there will be more primary consumers eating them
(b) They will decrease, then increase if the population of primary consumers change
(c) They will not be affected because the primary consumers were not affected
(d) They will attain climax population since there is no one to feed on them

41. The development of a flower into fruit without fertilization is referred to as .....
(a) asexual reproduction (b) sexual reproduction (c) cloning (d) parthenocarpy

42. Which of the following eye defects can be corrected with the use of converging lenses?
(a) myopia (b) hypermetropia (c) astigmatism (d) night blindness

43. Which of the following arthropods lacks antennae?
(a) Spider (b) Prawn (c) Cockroach (d) Millipede

44. If red blood cells are placed in hypertonic solution for some time, the cells become.....
(a) crenated (b) plasmolysed (c) haemolysed (d) unaffected

45. What is the hydroxide ion concentration [OH^-] in a solution of sodium hydroxide of pH 10.0?
(a) 10^{-2} (b) 10^{-4} (c) 10^{-3} (d) 10^{-1}

46. The reagent that removes CO_2 from a mixture of CO_2 and N_2 is.....
(a) aqueous potassium hydroxide (b) alkaline Pyrogallol (c) concentrated H_2SO_4 (d) calcium oxide

47. The group Protozoa includes the following organisms except
(a) Amoeba (b) *Chlamydomonas* (c) *Plasmodium* (d) *Trypanosome*

48. An example of a plant which has leaf specially modified to trap animals is .....
(a) garlic (b) cactus (c) sundew (d) hibiscus

49. Lukas belongs to blood group O while Mary belongs to blood group AB. If Mary gets married to Lukas, what is the probability that the couple can produce an offspring with blood group O?
(a) 0% (b) 50% (c) 70% (d) 100%

50. Which of the following air pollutants can cause acid rain?
(a) Carbon monoxide (b) Sulphur dioxide (c) Smoke and Sooth (d) Dust particles