SWAMI VIVEKANANDA YOGA ANUSANDHANA SAMSTHANA (S-VYASA),
(Declared as Deemed-to-be University under Section 3 of UGC act, 1956)

BSC T 505 Modern Science

Date: 29.05.2012   Time: 3 hours   Max Marks: 100

All questions are compulsory

1. Fill in the blanks: (1 x 10 = 10)
   a. Two strands of DNA are held together by _____ bond.
   b. A 'p' orbital can accommodate maximum of _____ electrons.
   c. _____ blood group is universal donor.
   d. Adenine always pairs with _____ in DNA.
   e. Electrons in _____ shell participate in chemical reactions.
   f. Pasteurization is processing of _____.
   g. Shape of 's' orbital is _____.
   h. 60 Km/h = _____ m/s.
   i. 25 μm = _____ cm.
   j. As bond length decreases, bond strength _____.

2. Match the following: (1 x 5 = 5)
   a. Newton   i.   Evolution
   b. Gregor Mendal   ii.   Nitrogen
   c. Triple bond   iii. Time period of revolution
   d. Charles Darwin   iv.   F=ma
   e. Kepler   v.   Genetics

3. True or False: (1 x 10 = 10)
   a. As wavelength increases, frequency also increases.
   b. Acceleration due to gravity g does not change throughout the earth.
   c. Nucleus of an atom consists of electron and proton.
   d. Mutation occurs because of wrong replication of DNA.
   e. Neutron is neutral because it has equal number of electrons and protons.
   f. Nitrogen has 5 electrons in its outermost shell.
   g. According to Kepler's first law, the earth revolves in an elliptical path with sun in the center of the ellipse.
   h. During summer earth moves faster than in summer, around the sun.
   i. Diamond and Carbon are two different isomers of Carbon.
   j. 'O' blood group is universal acceptor.
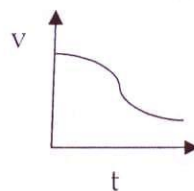
4. Write briefly about: (2x 5 = 10)
   a. Time period of a wave
   b. Electronic configuration of Oxygen
   c. Centripetal force
   d. Phenotypic ratio
   e. Pick up the constant acceleration from the following graphs:
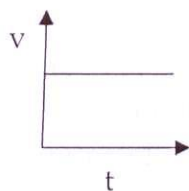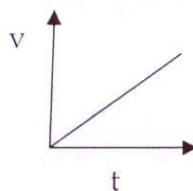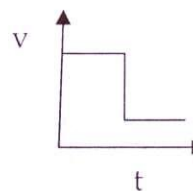

   (a)   (b)   (c)   (d)

5. Answer the following: (5 x 5= 25)
   a. Explain Resonance using suitable example.
   b. Differentiate between Gravitational constant 'G' and acceleration due to gravity 'g'.
   c. Why a bicycle when turns suddenly on a flat road is thrown out of the road?
   d. State Kepler's three laws of planetary motion.
   e. Explain the laws of natural selection.

6. Answer the following: (10 x 4 = 40)
   a. Explain ionic and covalent bond using suitable examples. Describe the formation of NaCl using suitable diagram.
   b. Explain Newton's three laws of motion with suitable examples and diagrams.
   c. Answer briefly:
      i. Suppose a child is of blood type A and the mother is of type O. What type or types may the father belong to? (5)
      ii. Explain with reason why two bodies of different masses when dropped from same height fall at the same time? (3)
      iii. Why O_4 molecule does exist? (2)
   d. Describe the structure and function of DNA using detailed diagram.