1. A synchronous relay satellite reflect TV-signals from one place to the other because its period of revolution is

(A) greater than the period of rotation of earth about its axis

(B) less than the period of rotation of earth

(C) equal to the period of rotation of earth

(D) equal to 86.4 minutes

2. The length of wire is increased by 1 mm on the application of given load. In a wire of the same material but of length and radius twice that of first, an application of the same force extension produced is

(A) 2 mm (B) 0.5 mm

(C) 4 mm (D) 0.25 mm

3. The radius of the soap bubble is r and the surface tension of a soap solution is T. Keeping the temperature constant the bubble is blown to twice its diameter. Necessary energy will be

(A) 24 r2T (B) 8 r2T

(C) 12 r2T (D) 16 r2T

4. A piece of ice having a stone frozen in it floats in a glass vessel filled with water. How will the level of water in the vessel change when the ice melts?

(A) the level will rise (B) the level will not change

(C) the level will fall (D) some water will flow out

5. Two pieces of different metals are suspended from the arms of a balance and are found to be in equilibrium when kept immersed in water. The mass of one piece is 32 gm and its density is 8 gm/cc. The density of the other is 5 gm/cc. Then the mass of the other piece is

(A) 28 gms (B) 35 gms

(C) 31 gms (D) 33.6 gms

6. Four massless springs of force constant k each

are attached to a mass M is displaced in the

horizontal direction, then the frequency of

oscillation is MK K KK(A) 25k2M(B) 22M5k(C) 25Mk(D) 22Mk

7. When the displacement is half of the amplitude, then what fraction of total energy of a simple

harmonic oscillator is kinetic?

(A) 2/7 (B) 3/4

(C) 2/9 (D) 5/718. A sound wave is passing through an air column. During the consequent compressions and

rarefactions

(A) Boyle's law is obeyed (B) density of air remains constant

(C) bulk modulus of air oscillates (D) there is no heat transfer

9. Two sounding bodies producing progressive waves are given by

y1 = 4 sin 400 t, y2 = 3 sin 404 t are situated very near to the ears of a person. He will hear

(A) 2 beats /sec with intensity ratio 49/1 (B) 2 beats /sec with intensity ratio 4/3

(C) 4 beats/sec with intensity ratio 7/ 1 (D) 4 beats /sec with intensity ratio 4/3

10. A, B and C are three tuning forks. The frequency of A is 350 HZ. A and B produce 5

beats/sec, while B and C produce 4 beats/sec when A is loaded with wax, it produces 2

beats/sec with B and 6 beats/sec with C. The frequencies of B and C are

(A) 345, 341 (B) 355, 351

(C) 345, 349 (D) 355, 359

MATHS:

1. If , are the roots of equation ax2

+ bx + b = 0, then the value of ab

is

(A) 0 (B) 1

(C) 2 (D) 2

2. n-1C3 + n-1C4 > nC3, then value of 'n' can be

(A) 4 (B) 6

(C) 7 (D) 8

3. The number of ways of arranging the letter AAAAA BBB CCC D EE F in a row when no two

C's are together is (A) !!(!) !!35 3 215(B) 5!3!2! 4!12! 413P(C) 313 P5 3 212! ! !!(D) none of these

4. The number of committees of 3 members can be formed from 6 gentlemen and 4 ladies

(A) 6C5 (B) 10P5

(C) 252 (D) 120

5. The number of all possible selections of one or more questions from 8 given questions, each question having an alternative is

(A) 28– 1 (B) 38– 1(C) 48– 1 (D) none of these

6. The coefficient of x4in the expansion of (1+x+x2+x3)nis

(A)nC4 (B) nC4+nC2

(C) nC4+nC1+nC4nC2 (D) nC4+nC2+nC2

7. Value of nr 0rn(2r 1) Cis equal to

(A) n.2n

(B) (n + 1)2n

(C) (2n + 1)2n

(D) none of these.

8. The square roots of 1 + 2x + 3x2+ 4x3+ . . . . . is

(A) 1 – x + x2– x3+ . . . . . (B) 1 + x2+ x4+ . . . .

(C) 1 – x2+ x4– x6+ . . . . (D) 1 + x + x2+ x3+ . . . .