54. The resolving power of a grating with a grating spacing d and number of rulings N, in a given order,

   (A) depends both on N and d .

   (B) depends only on d and is independent of N.

   (C) depends only on N and is independent of d.

   (D) is independent of both N and d and depends only on the ratio of average wavelength of the incident light to the grating spacing d.

55. If work done in forming a liquid drop of radius R is W, then work done in breaking this liquid drop into 1000 small equal sized drops is

   (A) $6\,W$.

   (B) $10\,W$.

   (C) $4\,W$.

   (D) $9\,W$.

56. Among three tuning forks P, Q and R, P resonates at a frequency 2% greater than Q, and R resonates at a frequency 4% less than that of Q. When P and R are resonated together, if 9 beats per second are heard, then resonance frequency of Q is

   (A) 120 Hz .

   (B) 150 Hz .

   (C) 250 Hz .

   (D) 90 Hz .

57. A stone of mass m is tied to one end of a string and revolves in a vertical circle of radius R. If v_1 and v_2 are the velocities at the two points A and B respectively, the net force acting on the stone at the highest point A and the lowest point B of the circle along the vertically downwards direction are

   (A) $F_A = mg + T_1;$ $\quad F_B = mg - T_2.$

   (B) $F_A = mg - T_1;$ $\quad F_B = mg + T_2.$

   (C) $F_A = mg + T_1 + \dfrac{mv_1^2}{R};$ $\quad F_B = mg - T_2 + \dfrac{mv_2^2}{R}.$

   (D) $F_A = mg + T_1 + \dfrac{mv_1^2}{R};$ $\quad F_B = mg - T_2 - \dfrac{mv_2^2}{R}.$