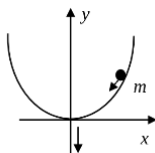


53) The polarizability of the hydrogen atom in unit of  $(C^2m/N)$  is

- a)  $2.0 \times 10^{-40}$
- b)  $1.4 \times 10^{-41}$
- c)  $1.4 \times 10^{-40}$
- d)  $2.0 \times 10^{-39}$

**Statement for Linked Answer Questions 54 and 55:**

A particle of mass  $m$  slides under the gravity without friction along the parabolic path  $y = ax^2$  as shown in the figure. Here  $a$  is a constant.



54) The Lagrangian for this particle is given by,

- a)  $L = \frac{1}{2}m\dot{x}^2 - mgax^2$
- b)  $L = \frac{1}{2}m(1 + 4a^2x^2)\dot{x}^2 - mgax^2$
- c)  $L = \frac{1}{2}m\dot{x}^2 + mgax^2$
- d)  $L = \frac{1}{2}m(1 + 4a^2x^2)\dot{x}^2 + mgax^2$

55) The Lagrange's equation of motion of the particle is

- a)  $\ddot{x} = 2gax$
- b)  $m(1 + 4a^2x^2)\ddot{x} = -2mgax - 4ma^2x\dot{x}^2$
- c)  $m(1 + 4a^2x^2)\ddot{x} = 2mgax + 4ma^2x\dot{x}^2$
- d)  $\ddot{x} = -2gax$

56) Choose the grammatically **INCORRECT** sentence:

- a) They gave us the money back less the service charges of Three Hundred rupees.
- b) This country's expenditure is not less than that of Bangladesh.
- c) The committee initially asked for a funding of Fifty Lakh rupees, but later settled for a lesser sum.
- d) This country's expenditure on educational reforms is very less.

57) Which one of the following options is the closest in meaning to the word given below?

**Mitigate**

- a) Diminish

- b) Divulge
- c) Dedicate
- d) Denote

- 58) Choose the most appropriate alternative from the options given below to complete the following sentence: **Despite several \_\_\_\_\_ the mission succeeded in its attempt to resolve the conflict.**
- a) attempts
  - b) setbacks
  - c) meetings
  - d) delegations
- 59) The cost function for a product in a firm is given by  $5q^2$ , where  $q$  is the amount of production. The firm can sell the product at a market price of Rs.50 per unit. The number of units to be produced by the firm such that the profit is maximized is:
- a) 5
  - b) 10
  - c) 15
  - d) 25
- 60) Choose the most appropriate alternative from the options given below to complete the following sentence: **Suresh's dog is the one \_\_\_\_\_ was hurt in the stampede.**
- a) that
  - b) which
  - c) who
  - d) whom
- 61) Which of the following assertions are CORRECT?
- P: Adding 7 to each entry in a list adds 7 to the mean of the list.  
 Q: Adding 7 to each entry in a list adds 7 to the standard deviation of the list.  
 R: Doubling each entry in a list doubles the mean of the list.  
 S: Doubling each entry in a list leaves the standard deviation of the list unchanged.
- a) P, Q
  - b) Q, R
  - c) P, R
  - d) R, S
- 62) An automobile plant contracted to buy shock absorbers from two suppliers X and Y. X supplies 60% and Y supplies 40% of the shock absorbers. All shock absorbers are subjected to a quality test. The ones that pass the quality test are considered reliable. Of X's shock absorbers, 96% are reliable. Of Y's shock absorbers, 72% are reliable. The probability that a randomly chosen shock absorber, which is found to be reliable, is made by Y is:
- a) 0.288
  - b) 0.334
  - c) 0.667
  - d) 0.720
- 63) A political party orders an arch for the entrance to the ground in which the annual

convention is being held. The profile of the arch follows the equation  $y = 2x - 0.1x^2$  where  $y$  is the height of the arch in meters. The maximum possible height of the arch is:

- a) 8 meters
  - b) 10 meters
  - c) 12 meters
  - d) 14 meters
- 64) Wanted Temporary, part-time persons for the post of Field Interviewer to conduct personal interviews to collect and collate economic data. Requirements: High school pass, must be available for day, evening, and Saturday work. Transportation paid, expenses reimbursed. Which one of the following is the best inference from the above advertisement?
- a) Gender-discriminatory
  - b) Xenophobic
  - c) Not designed to make the post attractive
  - d) Not gender-discriminatory
- 65) Given the sequence of terms: AD, CG, FK, JP, the next term is:
- a) OV
  - b) OW
  - c) PV
  - d) PW