Case Study on Exponents

Passage 1:

In a class, science teacher give some information to all students about Solar system in following manner.
Distance of earth from sun = 149600000 km
Mass of earth = 597000000000000000000000 kg
Mass of Mars = 642000000000000000000000000000 kg
Mass of sun = 199000000000000000000000000000 kg
Mass of moon = 735000000000000000000 kg

Based on the above information, answer the following questions:

Q. 1. Write distance of earth from sun in standard form?
(a) 1.496×10^{8} km
(b) 14.96×10^{8} km
(c) 1.496×10^{9} km
(d) 14.96×10^{9} km

Q. 2. Write mass of sun in standard notation?
(a) 19.9×10^{28} kg
(b) 1.99×10^{28} kg
(c) 1.99×10^{30} kg
(d) 19.9×10^{30} kg

Q. 3. Mass of earth in standard notation:
(a) 5.97×10^{24} kg
(b) 59.7×10^{24} kg
(c) 5.97×10^{26} kg
(d) 59.7×10^{26} kg

Q.4. Mass of the moon in standard notation:
(a) 7.35×10^{22} g
(b) 7.35×10^{20} g
(c) 7.35×10^{25} g
(d) 73.5×10^{25} g

Q. 5. Find the total mass of earth and moon in standard form.

Q. 6. Find difference of mass of mars from mass of sun in standard form.

Case Study on Direct and Inverse Proportion

Passage 2.

A hotel has 320 rooms and 32 cleaners to maintain them. With full capacity of staff, it took 2 hours to clean all the rooms. Equal number of rooms are allocated for each staff member for cleaning.

Q. 1. On Monday 25% of the cleaners were not available. Will the cleaning of all rooms take more than 2 hours? How can you say so? Also find the required time to clean all the rooms in this case.

Q. 2. Ishan says, "The number cleaners available in the hotel is directly proportional to the time taken by them to clean the rooms."
Mira says, "The number of cleaners available in the hotel is inversely proportional to the time taken by them to clean the rooms."
Who is correct? Give reason.

Q. 3. The hotel administration hired 8 more cleaners. What is the change in number of rooms maintained by each cleaner?

Q. 4. How many rooms has to be cleaned in an hour by each cleaner after the increase in the number of staff?
(a) 1
(b) 4
(c) 8
(d) 10

Q.5 Guests are arriving within 40 minutes. Then how many more cleaners must be hired to clean all the rooms on time?