Important Assertion and Reason Questions on Surface Areas and Volumes

Directions: In the following questions a statement of assertion (A) is followed by a statement of reason(R). Mark the correct choice as:

Choose the correct option for the following questions:

- (A). Both Assertion (A) and Reason (R) are true, and Reason is the correct explanation of Assertion.
- (B). Both Assertion (A) and Reason (R) are true, but Reason is not the correct explanation of Assertion.
- (C). Assertion (A) is true, but Reason (R) is false.
- (D). Assertion (A) is false, but Reason (R) is true.

Question 1:

Assertion (A): The volume of a cube is given by: $V=a3$

Reason (R): All edges of a cube are equal.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 2:

Assertion (A): The curved surface area of a cylinder is: $CSA=2\pi rh$

Reason (R): The curved surface of a cylinder forms a rectangle when opened.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 3:

Assertion (A): The volume of a cone is one-third the volume of a cylinder having the same base and height.

Reason (R): A cone occupies less space than a cylinder with the same dimensions.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (B). Both A and R are true, but R is not the correct explanation of A.

Question 4:

Assertion (A): The total surface area of a sphere is: TSA=4πr2

Reason (R): A sphere has only one curved surface.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (B). Both A and R are true, but R is not the correct explanation of A.

Question 5:

Assertion (A): The slant height of a cone is given by: l=r2+h2

Reason (R): The radius, height, and slant height form a right triangle.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 6:

Assertion (A): The volume of a sphere is: $V=43\pi r3$

Reason (R): The volume of a sphere depends on the cube of its radius.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 7:

Assertion (A): A hemisphere is half of a sphere.

Reason (R): A sphere divided by a plane through its center forms two hemispheres.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 8:

Assertion (A): The total surface area of a cuboid is: $TSA=2(lb+bh+hl)$

Reason (R): A cuboid has six rectangular faces.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 9:

Assertion (A): The curved surface area of a cone is: $CSA=\pi rl$

Reason (R): The curved surface depends on radius and slant height.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 10:

Assertion (A): The volume of a cylinder is: V=πr2h

Reason (R): Volume equals base area multiplied by height.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 11:

Assertion (A): The total surface area of a hemisphere is: TSA=3πr2

Reason (R): The total surface area includes the curved surface area and the circular base.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 12:

Assertion (A): If the radius of a sphere doubles, its volume becomes eight times.

Reason (R): Volume depends on the cube of the radius.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 13:

Assertion (A): The volume of a cuboid is: $V=l\times b\times h$

Reason (R): Volume measures the space occupied by a solid.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (B). Both A and R are true, but R is not the correct explanation of A.

Question 14:

Assertion (A): The curved surface area of a hemisphere is: $CSA=2\pi r2$

Reason (R): A hemisphere has half the curved surface area of a sphere.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 15:

Assertion (A): The total surface area of a cone is: $TSA=\pi r(l+r)$

Reason (R): Total surface area includes the curved surface area and the base area.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.

(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

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