

Science



1. What happens to the gravitational potential at the centre of the uniform spherical shell which shrinks gradually?

- (a) Remains constant
- (b) Decreases
- (c) Increases
- (d) Oscillates

Answer: (b) Decreases

2. What is the relation between the escape velocity and orbital velocity of a satellite, if the satellite is close to the earth's surface?

- (a) $v_e = 2v_0$
- (b) $v_e = \sqrt{2}v_0$
- (c) $v_0 = 2v_e$
- (d) $v_0 = v_e$

Answer: (b) $v_e = \sqrt{2}v_0$

3. What happens to the weight of the body if the weight becomes 116 at a certain. Also, consider the radius of the earth to be R.

- (a) 4R
- (b) 15R
- (c) 5R
- (d) 3R

Answer: (d) 3R

4. What is the maximum height attained by the rocket above the surface of the earth if the mass of the rocket is M, and the initial speed to be V. Assume that R is the radius of the earth.

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(a) RgR^2V^2-1

(b) R^2gRV^2-1

(c) $R(gR^2V^2-1)$

(d) $R(2gRV^2-1)$

Answer: (b) R^2gRV^2-1

5. What is the increase in the potential energy of the body with mass m if the body is taken at the height h which is equal to the radius of the earth?

(a) mgR

(b) $2mgR$

(c) $12mgR$

(d) $14mgR$

Answer: (c) $12mgR$

6. Consider a body of mass m which needs to be moved from an orbit of radius $2R$ to $3R$. What is the energy required

(a) $GMm/2R^2$

(b) $GMm/6R$

(c) $GMm/8R$

(d) $GMm/3R^2$

Answer: (b) $GMm/6R$

7. The distance between the closest planet and the sun is r_1 while the distance between the farthest planet and the sun is r_2 . The linear velocities of these planets is v_1 and v_2 respectively. What is the ratio of v_1/v_2

(a) $(r_1/r_2)^2$

(b) $(r_1 r_2)$

(c) $(r_2 r_1)$

(d) $(r_2 r_1)^2$

Answer: (c) $(r_2 r_1)$

8. Choose the factor on which the orbital velocity does not depend when the satellite is orbiting close to the earth's surface

(a) The mass of the earth

(b) The mass of the satellite

(c) The orbital radius

(d) The radius of the earth

Answer: (b) The mass of the satellite

9. If a satellite takes time T for revolution, the the kinetic energy is proportional to

(a) $1/T$

(b) T^{-2}

(c) $1/T^2$

(d) $1/T^3$

Answer: (b) T^{-2}

10. The atmosphere around the earth is held by

(a) Gravity

(b) Winds

(c) Clouds

(d) None of the above

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Answer: (a) Gravity

11. Elements X and Y combine to form two compounds XY and X₂Y. Find the atomic weight of X and Y, if the weight of 0.1 moles of XY is 10g and 0.05 moles of X₂Y is 9g

(a) 30, 20

(b) 80, 20

(c) 60, 40

(d) 20, 30

Answer: (b)

12. Which one will have maximum numbers of water molecules?

(a) 18 molecules of water

(b) 1.8 grams of water

(c) 18 grams of water

(d) 18 moles of water

Answer: (d)

13. The number of atoms present in 0.1 moles of a triatomic gas is

(a) 1.806×10^{23}

(b) 1.806×10^{22}

(c) 3.600×10^{23}

(d) 6.026×10^{22}

Answer: (a)

14. Find the volume of O₂ required to burn 1 L of propane completely, measured at 0°C temperature and 1 atm pressure

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(a) 10 L

(b) 7 L

(c) 6 L

(d) 5 L

Answer: (d)

15. A gas X has C_p and C_v ratio as 1.4, at NTP 11.2 L of gas X will contain _____ number of atoms

(a) 1.2×10^{23}

(b) 3.01×10^{23}

(c) 2.01×10^{23}

(d) 6.02×10^{23}

Answer: (d)

16. Which of the species is not paramagnetic?

(a) As^+

(b) Cl^-

(c) Ne^{2+}

(d) Be^+

Answer: (b)

17. Pressure has the same dimension as _____

(a) energy per unit volume

(b) energy

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(c) force per unit volume

(d) force

Answer: (a)

18. A container has an equal mass of H_2 , O_2 and CH_4 at $27^\circ C$, the ratio of their volume is

(a) 16:8:1

(b) 8:1:2

(c) 16:1:2

(d) 8:16:1

Answer: (c)

19. There are two chlorides of sulphur S_2Cl_2 and SCl_2 . What is the equivalent mass of S in SCl_2

(a) 64.8 g/mole

(b) 32 g/mole

(c) 16 g/mole

(d) 8 g/mole

Answer: (c)

20. Boron exists as two stable isotopes; ^{10}B (19%) and ^{11}B (81%). Find out the average atomic weight of boron in the periodic table

(a) 10.0

(b) 11.2

(c) 10.2

(d) 10.8

Answer: (d)

21. Which is the best-suited method for the separation of para and ortho-nitrophenols from 1:1 mixture?

- (a) crystallisation
- (b) chromatography
- (c) sublimation
- (d) steam distillation

Answer: (d)

22. Find the incorrect statement for a nucleophile

- (a) A nucleophile is a Lewis acid
- (b) Nucleophiles do not seek electron
- (c) Ammonia is a nucleophile
- (d) Nucleophiles attack low electron density sites

Answer: (a)

23. Which among the following is the most deactivating meta-directing group in aromatic substitution reaction?

- (a) -COOH
- (b) -SO₃H
- (c) -NO₂
- (d) -CN

Answer: (c)

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24. Ammonia evolved from 0.75 g of the soil sample in the Kjeldahl's method for nitrogen estimation, neutralises 10 ml of 1M H₂SO₄. Find the percentage of nitrogen present in the soil

- (a) 35.33
- (b) 37.33
- (c) 43.33
- (d) 45.33

Answer: (b)

25. The correct order of increasing nucleophilicity is

- (a) Cl⁻ < Br⁻ < I⁻
- (b) Br⁻ < Cl⁻ < I⁻
- (c) I⁻ < Br⁻ < Cl⁻
- (d) I⁻ < Cl⁻ < Br⁻

Answer: (a)

26. Which of the following are energy foods?

- (a) Carbohydrates and fats
- (b) Proteins and mineral salts
- (c) Vitamins and minerals
- (d) Water and roughage

Answer: (a)

27. In which mode of nutrition an organism de-rives its food from the body of another living organism without killing it?

- (a) Saprotrophic nutrition

- (b) Parasitic nutrition
- (c) Holozoic nutrition
- (d) Autotrophic nutrition

Answer: (b)

28. The mode of nutrition found in fungi is:

- (a) Parasitic nutrition
- (b) Holozoic nutrition
- (c) Autotrophic nutrition
- (d) Saprotrophic nutrition

Answer: (d)

29. Roots of the plants absorb water from the soil through the process of:

- (a) diffusion
- (b) transpiration
- (c) osmosis
- (d) None of these

Answer: (c)

30. The site of photosynthesis in the cells of a leaf is

- (a) chloroplast
- (b) mitochondria
- (c) cytoplasm
- (d) protoplasm

Answer: (a)

31. In amoeba, food is digested in the:

- (a) food vacuole
- (b) mitochondria
- (c) pseudopodia
- (d) chloroplast

Answer: (a)

32. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?

- (a) Starch breaking down into sugars.
- (b) Proteins breaking down into amino acids.
- (c) Absorption of vitamins.
- (d) Fats breaking down into fatty acids and glycerol.

Answer: (a)

33. Which plant hormone promotes dormancy in seeds and buds?

- (a) Auxin
- (b) Gibberellin
- (c) Cytokinin
- (d) Abscisic acid

Answer: (d)

34. Roots of plants are:

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- (a) positively geotropic
- (b) negatively geotropic
- (c) positively phototropic
- (d) None of these

Answer: (a)

35. Response of plant roots towards water is called:

- (a) Chemotropism
- b) Phototropism
- (c) Hydrotropism
- (d) Geotropism

Answer: (c)

36. Movement of sunflower in accordance with the path of Sun is due to

- (a) Chemotropism
- (b) Geotropism
- (c) Phototropism
- (d) Hydrotropism

Answer: (c)

37. Which plant hormone promotes cell division?

- (a) Auxin
- (b) Gibberellin
- (c) Cytokinin

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(d) Absciscic acid

Answer: (c)

38. During favourable conditions, Amoeba reproduces by

(a) multiple fission

(b) binary fission

(c) budding

(d) fragmentation

Answer: (b)

39. A feature of reproduction that is common to Amoeba, Yeast and Spirogyra is that

(a) they reproduce asexually

(b) they are all unicellular

(c) they reproduce only sexually

(d) they are all multicellular

Answer: (a)

40. The ability of a cell to divide into several cells during reproduction in Plasmodium is called

(a) budding

(b) multiple fission

(c) binary fission

(d) reduction division

Answer: (b)

41. Bryophyllum can be propagated vegetatively by the

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(a) stem

(b) leaf

(c) root

(d) flower

Answer: (b)

42. Vegetative propagation refers to formation of new plants from

(a) stem, flowers and fruits

(b) stem, leaves and flowers

(c) stem, roots and flowers

(d) stem, roots and leaves

Answer: (d)

43. Process of selecting individuals with desired characters by man is called

(a) Hybridization

(b) Reproduction

(c) Artificial selection

(d) Natural selection

Answer: (c)

44. Which one of the following pairs are homologous organs?

(a) Forelimbs of a bird and wings of a bat.

(b) Wings of a bird and wings of a butterfly.

(c) Pectoral fins of a fish and forelimbs of a horse.

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(d) Wings of a bat and wings of a cockroach.

Answer: (a)

45. The theory of evolution of species by natural selection was given by

(a) Mendel

(b) Darwin

(c) Lamarck

(d) Weismann

Answer: (b)

46. A cross between a tall pea-plant (TT) and a short pea-plant (tt) resulted in progenies that were all tall plants because

(a) tallness is the recessive trait.

(b) shortness is the dominant trait.

(c) height of pea-plant is not governed by gene T or t.

(d) tallness is the dominant trait.

Answer: (b)

47. The number of pairs of sex chromosomes in the zygote of a human being is

(a) 2

(b) 3

(c) 1

(d) 4

Answer: (c)

48. Which of the following is biodegradable?

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- (a) Aluminium can
- (b) Polythene bag
- (c) Cowdung
- (d) DDT

Answer: (c)

49. Which of the following is an abiotic component of an ecosystem?

- (a) Humus
- (b) Bacteria
- (c) Plants
- (d) Fungi

Answer: (a)

50. Which one of the following pairs belong to the category of primary consumers?

- (a) Eagle and snake
- (b) Grasshoppers & cattle
- (c) Snake and frog
- (d) Water beetles & fish

Answer: (b)

51. Which of the following chemicals causes depletion of the ozone layer?

- (a) Carbon tetrachloride
- (b) Methane
- (c) Chloro fluoro carbon

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(d) Carbon monoxide

Answer: (c)

52. In a food chain, the third trophic level is always occupied by

(a) herbivore

(b) carnivore

(c) decomposer

(d) producer

Answer: (b)