

Part : A

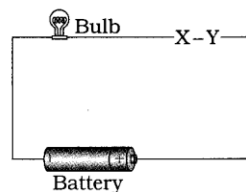
- In which of the following is bile secreted in human digestive system?
A. Liver ☐ B. Kidney ☐ C. Stomach ☐ D. Pancreas ☐
- What is the monomer unit of natural rubber?
A. Ethene ☐ B. Neoprene ☐ C. Tetrafluoroethene ☐ D. Isoprene ☐
- Which of the following is used in preparation of vinegar?
A. Propanone ☐ B. Methanal ☐ C. Acetic acid ☐ D. Ethanol ☐
- Which of the following functional groups constitutes the formation of detergent?
A. -COONa ☐ B. -COOH ☐ C. -OH ☐ D. $\text{-SO}_3\text{Na}$ ☐
- Which of the following is not a fossil fuel?
A. Wood ☐ B. Petroleum ☐ C. Natural gas ☐ D. Mineral coal ☐
- Which of the following is not a neutral oxide?
A. N_2O ☐ B. H_2O ☐ C. SO_2 ☐ D. CO ☐
- Whose formula is C_3H_8 ?
A. Ethane ☐ B. Propane ☐ C. Butane ☐ D. Methane ☐
- Pavan sorts some materials into two different groups and notes down their properties. They are listed in the following table:

Group I	Group II
Cannot be beaten into thin sheets.	Can be beaten into thin sheets.
When one end is in contact with a hot object, the other end does not become hot quickly.	When one end is in contact with a hot object, the other end becomes hot quickly.
Cannot be turned into thin wires.	Can be turned into thin wires.

Which of the following statements could be incorrect?

- Materials of Group I are generally not shiny and hard. ☐
 - Materials of Group I are generally less dense than materials of Group II. ☐
 - Materials of Group II can be used to make materials which are non-conductor of electricity. ☐
 - Materials of Group II can be used to make bells. ☐
- What is used as a catalyst in manufacture of sulphuric acid by contact process?
A. K_2O ☐ B. V_2O_5 ☐ C. Fe ☐ D. Al_2O_3 ☐

10. Who was the scientist to propound proton transfer of acid-base theory?
A. Bronsted-Lowry ☐ B. Robert Boyle ☐ C. Rutherford ☐ D. Arrhenius ☐
11. Which of the following is the formula of the iron ore 'Haematite'?
A. Fe_3O_4 ☐ B. FeCO_3 ☐ C. FeS_2 ☐ D. Fe_2O_3 ☐
12. Which of the following is a strong acid?
A. Acetic acid ☐ B. Tartaric acid ☐ C. Lactic acid ☐ D. Sulphuric acid ☐
13. Which of the following metals exists in nature in liquid state?
A. Copper ☐ B. Aluminium ☐ C. Gallium ☐ D. Iron ☐
14. Which by-product gas is released when an acid reacts with metal?
A. Di-oxygen ☐ B. Di-hydrogen ☐ C. Di-chlorine ☐ D. Di-nitrogen ☐
15. Which alloy is used to prepare scientific balance?
A. Steel ☐ B. Bronze ☐ C. Magnesium ☐ D. Duralumin ☐
16. What is added to the alkaline soil to make it neutral by farmers?
A. Gypsum ☐ B. Common salt ☐ C. Blue vitriol ☐ D. Lime ☐
17. During which process is blood filtered in Bowman's capsule?
A. Secretion ☐ B. Ultrafiltration ☐
C. Reabsorption ☐ D. None of the given ☐
18. Which of the following constitutes male reproductive system?
A. Ovary ☐ B. Fallopian tube ☐ C. Uterus ☐ D. Prostate gland ☐
19. The growth of a pollen tube towards ovule is caused by
A. hydrotropism ☐ B. gravitropism ☐ C. chemotropism ☐ D. phototropism ☐
20. Which valve constitutes its presence between left atrium and left ventricle of human heart?
A. Tricuspid valve ☐ B. Semicircular valve ☐
C. Bicuspid valve ☐ D. None of the given ☐
21. Which of the following brings oxygenated blood into left atrium in heart?
A. Inferior vana cava ☐ B. Pulmonary artery ☐
C. Pulmonary vein ☐ D. Superior vana cava ☐
22. It is a commonly held misconception that the mother's egg is responsible for determining whether the baby will be a boy or a girl. But actually it is the father's sperm, which decides this.
Which of the following makes the sperm the decisive factor?
A. There are more number of chromosomes in sperms compared to eggs. ☐
B. Hormones are secreted only in the males which are present in the sperms. ☐
C. A sperm can have either of the two sex chromosomes, while the egg has only one. ☐
D. A long tail is found only in the sperm which is not present in the egg. ☐
23. The deficiency of which hormone causes diabetes?
A. Insulin ☐ B. Adrenaline ☐ C. Estrogen ☐ D. Thyroxin ☐
24. Which instrument converts mechanical energy to electrical energy?
A. Electric iron ☐ B. Electric generator ☐
C. Electric oven ☐ D. Electric motor ☐
25. Sonika is working with the circuit shown in the figure.
The circuit has two gaps X and Y. She has wires of five different materials I, II, III, IV and V. She knows that the bulb will light up only when both gaps are filled with conducting materials.



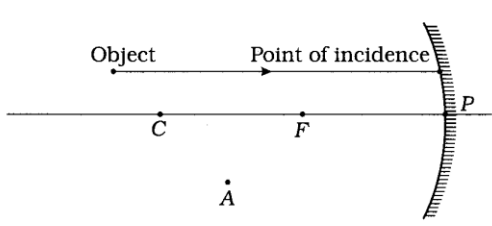
She records her observations in a table. After completing the experiment, ink fell on the paper and she lost entries in row 3.

	Material in X	Material in Y	Bulb (On / Off)
1	I	II	Off
2	I	IV	On
3			Off
4	III	V	On

Based on the rest of the information in the table, what could be the materials in row 3?

- A. II and III ☐ B. III and IV ☐ C. IV and V ☐ D. I and III ☐

26. Who gave the principle of electromagnetic induction?
A. Oersted ☐ B. Ampere ☐ C. Volta ☐ D. Faraday ☐
27. Which of the following is a satellite of Neptune?
A. Phobos ☐ B. Deimos ☐ C. Triton ☐ D. Titan ☐
28. Which of the following represents Ohm's law?
A. $I = V \cdot R$ ☐ B. $I = \frac{R}{V}$ ☐ C. $I = \frac{V}{R}$ ☐ D. $I = Q \cdot t$ ☐
29. Raghu learnt something in school and he told his friends "An object can appear smaller or bigger in size depending on its distance from you. So, an elephant can be looked as small as a cat if it is far away."
Based on this, his friends said the following:
Kabir: "All stars are of the same size."
Raina: "All other stars are definitely smaller than the Sun."
Karen: "The Sun and the Moon are definitely of the same size."
Shifa: "There could be a star which is bigger than the Moon."
Who is correct?
A. only Raina. ☐ B. only Kabir and Karen. ☐
C. only Kabir and Raina. ☐ D. only Shifa. ☐
30. Which of the following is not a member of solar system?
A. Shooting star ☐ B. Sun ☐ C. Artificial satellite ☐ D. Asteroid ☐
31. Which of the following detects the presence of electrical energy?
A. Battery ☐ B. Voltmeter ☐ C. Galvanometer ☐ D. Fuse ☐
32. Which artificial satellite is responsible for weather forecast?
A. INSAT ☐ B. CARTOSAT ☐ C. EDUSAT ☐ D. METSAT ☐
33. Which of the following is responsible for the 80 % depreciation in the ozone layer?
A. Chloride ion ☐ B. Sulphide ion ☐
C. Magnesium ion ☐ D. Chlorofluorocarbon ☐
34. By the process of artificial selection evolution, which of the following is developed for sterile flowers?
A. Cauliflower ☐ B. Kohlrabi ☐ C. Kale ☐ D. Broccoli ☐
35. Which leaves are used in the manufacture of bidis?
A. Tendu ☐ B. Eucalyptus ☐ C. Banyan ☐ D. Khakro ☐
36. Which of the following is an example of biodegradable waste?
A. Metal ☐ B. Plastic ☐ C. Fruits ☐ D. Glass ☐

37. Who was the first scientist to perform series of experiments to study acquired and inherited traits?
A. Sutton ☐ B. Mendel ☐ C. Khurana ☐ D. Wattson ☐
38. Chipko-Andolan (Hug the trees movement) is the well-known example of conservation of which form of nature?
A. Water ☐ B. Coal ☐ C. Petroleum ☐ D. Jungle ☐
39. Which colour of light deviates the maximum in the dispersion of white light by a prism?
A. Blue ☐ B. Green ☐ C. Red ☐ D. Violet ☐
40. In which part of the body is the blood purified?
A. Atrium ☐ B. Lungs ☐ C. Ventricle ☐ D. Heart ☐
41. Find the focal length of a convex lens, if its power is +2.0 D.
A. -0.5 m ☐ B. 1 m ☐ C. -1 m ☐ D. 0.5 m ☐
42. What are the components of water gas?
A. Carbon and Hydrogen ☐ B. Carbon monoxide and Hydrogen ☐
C. Ammonia and Hydrogen ☐ D. Carbon dioxide and Hydrogen ☐
43. What is the diameter of Hydrogen atom in nm?
A. 10 ☐ B. 0.1 ☐ C. 0.01 ☐ D. 1 ☐
44. Which type of coal is used in thermal power plants?
A. Lignite ☐ B. Bitumen ☐ C. Anthracite ☐ D. Peat ☐
45. What is the maximum capacity of a normal human eye to see small objects?
A. 10 micrometre ☐ B. 100 micrometre ☐
C. 1000 micrometre ☐ D. 10,000 micrometre ☐
46. From the listed electrical devices, which of these releases heat energy that is not appreciated?
A. Electric motor ☐ B. Electric heater ☐ C. Oven ☐ D. Water heater ☐
47. Bi-focal lenses consist of both concave and convex lenses. Glasses using bi-focal lenses are needed by people who have
P. nearsightedness Q. farsightedness R. night blindness
A. only Q ☐ B. only R ☐ C. both P and Q ☐ D. only P ☐
48. A point object emits rays in all directions. Consider one ray that the object emits which is parallel to the principal axis of a concave mirror as shown in the following figure. One of the points required to draw the reflected ray is the point of incidence itself which is labelled in the figure. Select the point in the figure given here through which the reflected ray passes.
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- A. C ☐ B. F ☐ C. A ☐ D. P ☐
49. What is the time difference between actual sunset and apparent sunset?
A. 20 seconds ☐ B. 2 minutes ☐ C. 20 minutes ☐ D. 2 seconds ☐

50. What is the main principle involved in Voltaic cell?
- Conversion of heat energy to electrical energy. ☐
 - Conversion of chemical energy to electrical energy. ☐
 - Conversion of electrical energy to chemical energy. ☐
 - Conversion of chemical energy to heat energy. ☐

Part : B

SECTION A

Answer the following question in short (within the limit of 30 words):
[2 marks each] 10

1. State the future challenges using Nanotechnology.

OR

- Explain the benefits of Nanotechnology to the health sector of human beings.
- By passing 240 volt in an electric heater, 2 A current passes through it. Find the current passed in the heater if 120 volt is passed; and also calculate the resistance of the coil of heater.
- Write the industrial name of ethyne with its uses.

OR

- What is isomerism? Write the name and the formula of isomers of butane.
- Explain the flow of blood in heart. (Figure not required)
- By which method is the domestic garbage disposed?

SECTION B

Answer the following questions in short (within the limit of 30 words):
[2 marks each] 10

- Describe briefly about planet Mars.
- 4.9 gm of H_2SO_4 is mixed with water to form 5 litres of aqueous solution. Find its concentration. (Molecular weight of H_2SO_4 is 98 gm/mole.)
- Write the characteristics of hormonal secretions.
- Explain the importance of homologous organs in process of evolution. OR
- Write a short note on heredity.
- What steps should be taken for conservation of energy resources?

SECTION C

Answer the following questions in briefly (within the limit of 50 words):
[3 marks each] 15

- State the defects of vision in human eyes and its remedies. Explain the defect of myopia and remedies to control it.
 - Explain the construction and working of electric bell with a diagram.
- OR
- What safety measures should be taken during the use of electricity?
 - Explain the industrial preparation of ammonia by Haber's process. Write two physical properties of ammonia.
 - Define functional group. Write any four organic functional groups with their formulae.

OR

14. Describe Fisher Tropsch process in the manufacture of propanone with equations and two uses.
15. With the help of a diagram, explain sexual reproduction in flowering plants.

SECTION D

Answer the following questions in detail (within the limit of 100 words):
[5 marks each] 15

16. What is mirror formula? Derive the relation $\frac{1}{u} + \frac{1}{v} = \frac{2}{R}$ for concave mirror.
17. What is refining of metals? Explain with diagram the method of electrolysis by which copper is purified.

OR

17. What is concentration of ores? Explain the process with diagram by which metallic ore with sulphide as an impurity is purified.
18. What is respiration? Explain the process of respiration in human beings. (Figure not required)

OR

18. What is nutrition? Explain with diagram the process of nutrition in amoeba.