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CLASS IX
SCIENCE (THEORY)
SUMMATIVE ASSESSMENT TERM II
SAMPLE PAPER II

Time: 3 hours M.M.: 80

General Instructions:

i) The question paper comprises of two sections, A and B, you are to attempt both the sections.
ii) All questions are compulsory.
iii) There is no overall choice. However, internal choice has been provided in all the three questions of five marks category. Only one option in such questions is to be attempted.
iv) All questions of section A and all questions of section B are to be attempted separately.
v) Question numbers1 to 4 in section A are one mark question. These are to be answered in one word or one sentence.
vi) Questions numbers 5 to 13 are two marks questions, to be answered in about 30 words.
vii) Question numbers 14 to 22 are three marks questions, to be answered in about 50 words.
viii) Question numbers 23 to 25 are five marks questions, to be answered in about 70 marks.
ix) Question numbers 26 to 41 in section B are multiple choice questions are based on practical skills. Each question is a one mark question. You are to choose one most appropriate response out of the four provided to you.

SECTION A

1. When do we say that work is done?

2. Joule per second is the unit of which physical quantity?

3. Name two processes that play an important role in oxygen cycle.
4. Name the zone of Earth's atmosphere where ozone is found.

5. Distinguish between loudness and intensity of sound.

6. a. Draw a sketch of Bohr's model of an atom with three shells.
b. If K and L shell of an atom are full, then what would be the total number of electrons in the atom?

7. What is the mass of?
(i) 0.2 mole of oxygen atoms?
(ii) 0.5 mole of water molecules?

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8. The volume of 50 g of a substance is 20 cm^3. If the density of water is 1g/cm^3, will the substance float or sink?

9. (a) How many cotyledons are present in the seeds of monocots and dicots?
(b)Why do bryophytes called as amphibians of the plant kingdom?

10. (a) Name the carbon compound responsible for depletion of ozone.
(b) What are the different states in which water is found during the water cycle?

11. (a) Give one example each of biotic and abiotic components of biosphere.
(b) Define water pollution.

12. Following observations were taken while determining the relative density of a liquid.
Weight of the solid in air = 0.100 kgf
Weight of the solid in liquid = 0.080 kgf
Weight of the solid in water = 0.075 kgf
Calculate:
(a) the apparent loss in weight of solid in liquid
(b) the apparent loss in weight of solid in water

13. List one similarity and one difference between fungi and plant.

14. Draw a neat diagram of human ear and label external ear, middle ear and inner ear.

15. A man whose mass is 50 kg climbs up 30 steps of the stairs in 30 seconds. If each step is 20 cm high, calculate the power used in climbing the stairs.

16. a. Two children are at opposite ends of an aluminium rod. One strikes the end of the rod with a stone. Find the ratio of times taken by the sound wave in air and in aluminium to reach the second child.

b. What is the consequence of two sound waves which arrive at the ear in a time interval shorter than 0.1 s?

17. (a) Who discovered vaccine for the first time?
(b) What is an antibiotic? Give two examples.

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18. (a). What is the significance of symbols?
(b). Define the atomic mass unit.
osbincbse.com (c) Why is it not possible to see an atom with naked eyes?

19. Using the valencies, write down the chemical formulae of the following compounds:

(i) Calcium nitrate (ii) Lead acetate
(iii) Barium chloride (iv) Silica
(v) Phosphine (vi) Baking soda

(Valency of calcium = 2, nitrate = 1, lead = 2, acetate = 1, barium = 2, chlorine = 1, silicon = 4, oxygen = 2, phosphorous = 3, hydrogen = 1, sodium = 1, bicarbonate = 1)

20. (a) Give one word for:

i. Diseases which can spread from one person to another.

ii. Diseases which are present since birth.

iii. Diseases which last for short duration.

iv. Diseases which last for longer duration.

(b) What is vaccination?

21. (a) Which chordate character has evolved has vertebral column in higher vertebrates? Define it.
(b) Why coelom is absent in diploblastic organisms?

22. (a) Define
i) Vector
ii) Carrier
(b) What are the modes of transmission of AIDS?

23. (a) What is transformation of energy? Explain with any two suitable examples.

(b) What must be the velocity of a moving body of mass 2 kg so that its K.E. is 25 J?
(c) Represent graphically a constant force acting on a body producing a displacement along the direction of motion on a force-displacement graph. What is the significance of force-displacement graph?

Or

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(a) Define potential energy. Give two examples.

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(b) Two bodies of different masses m_1 and m_2 ($m_1 > m_2$) have same kinetic energy. They are stopped by applying same retarding force. Which body will stop first?

24. (a) What would be the impact of increase in the concentration of carbon dioxide in the atmosphere?

(b)

(i) What do you mean by biogeochemical cycles? Name any two of the Biogeochemical cycles.

(ii) Nitrogen cycle is called a perfect cycle in nature. Explain.

Or

(a)

i. Name two agents of soil erosion

ii. Write any two steps used to control soil erosion.

(b) A forest area has cleaned by cutting trees for industrialisation purpose. List any two changes that will be brought in the water cycle of that area.

25. (a) How are electrons arranged around the nucleus in an atom?

(b) If an atom of an element has atomic number 11 and mass number 23, find the number of protons electrons and neutrons in its atoms.

Or

(a) The average atomic mass of a sample of an element X is 16.2 u. What are the percentages of isotopes $^{16}_{8}X$ and $^{18}_{8}X$ in the sample?

(b) Complete the following table.

Element	Atomic Number	Mass Number	Protons	Neutrons	Electrons
A	11	-	-	12	-
B	-	35	-	-	17
C	-	-	9	10	-
D	-	20	-	-	10

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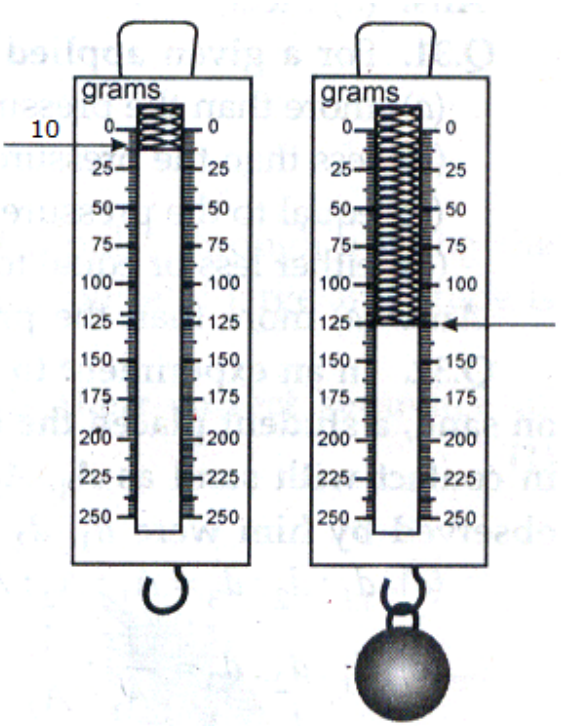
26. S.I. unit of weight is
(a) 1 kg (b) 1 g
(c) 1 g wt (d) 1 N

27. A spring balance
(a) Can measure weight only.
(b) Is used to determine density.
(c) May be used to determine mass as well as weight.
(d) Is used to measure mass only.

28. The spring balance shown here is used to measure the mass of a given solid. The mass of a solid is:



(a) 115 g (b) 118g
(c) 120 g (d) 125 g

29. Density of salty water as compared to the density of pure water
(a) is less (b) is always more
(c) is equal (d) may be less or more

30. Which principle tells us about the decrease in weight of a body when immersed in a liquid?
(a) Pascal's law (b) Avogadro's law
(c) Boyle's law (d) Archimedes' law

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31. Sound waves in air are:
(a) Longitudinal waves (b) Transverse waves
(c) Shock waves (d) Radio waves

32. The thread used to tie a solid should be
(a) As fine as possible (b) Fine but strong enough
(c) Thick (d) A metallic wire

33. If we want to determine the volume of a solid by immersing it in water, the solid should be
(a) Any solid (b) Heavier than water
(c) Insoluble in water (d) Heavier than water and insoluble in it

34. A metallic disc is gently placed on sand and disc exerts a pressure on sand. If another disc of same radius and mass is gently placed over the first metal disc, then
(a) Pressure is doubled.
(b) Pressure remains unchanged.
(c) Pressure is reduced to half.
(d) Pressure is quadrupled.

35. Which of the following statement is wrong?
(a) Sound travels as waves.
(b) Sound can be reflected.
(c) Sound is a form of energy.
(d) Sound travels faster in vacuum than in air.

36. Thallophyta is a group of plants which:
(a) Bear flowers
(b) Have well developed roots, stem and leaves.
(c) Do not have well differentiated body.
(d) Have naked seeds.

37. The exoskeleton of cockroach is made up of:
(a) Cartilage (b) Calcium and phosphorous
(c) Chitin (d) Cellulose

38. Bala observed the position of mouth in a bony fish as:
(a) Dorsally placed (b) Ventrally placed
(c) Terminal placed (d) Anteriorly placed

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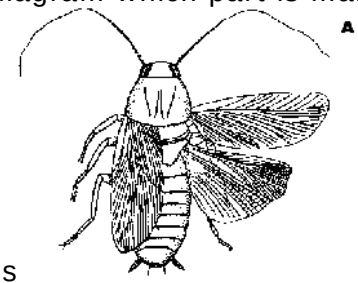
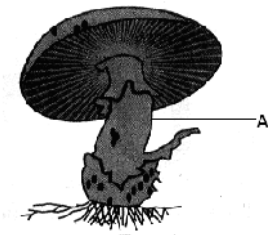
39. In the given diagram which part is marked A?



(a) Jointed legs
(b) Antenna
(c) Mouth part
(d) Spiracle

40. Four students label part A of the given figure. Which is the correct labeling?

(a) Gills (b) Pilius
(c) Stipe (d) Annulus



41. The sub division of Spirogyra is:

(a) Algae (b) Fungi
(c) Bryophyta (d) Pteridophyta

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Marking Scheme
Science (Theory)
Second Term (SA-II)
Class –IX
2010-2011

SECTION A

Ans. 1. When a force acts on an object and displacement occurs in the direction of force, we say that work is done. 1

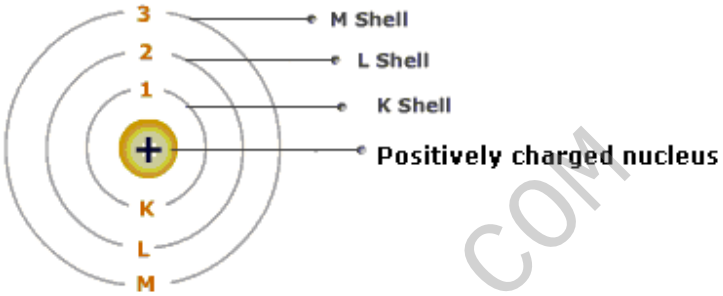
Ans.2. It is the unit of power. 1

Ans.3. i. Photosynthesis ½
ii.Respiration ½

Ans.4. Stratosphere. 1

Ans. 5. Intensity of sound is the amount of sound energy passing each second through unit area. 1
Loudness is the measure of response of the ear to the sound. 1

Ans. 6. a.



1

b. Number of electrons in fully filled K shell = 2
Number of electrons in fully filled L shell = 8
Therefore, total number of electrons in an atom = 2 + 8 = 10 electrons 1

Ans.7. (i) Mass = Number of moles x Atomic mass 1/2

∴ Mass of oxygen atoms = 0.2 x 16 = 3.2 g 1/2

Mass of water molecules = Number of moles x Molar mass of water (H_2O) 1/2

= 0.5 x (2 x 1 + 16) = 0.5 x 18 = 9.0 g 1/2

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Ans.8. Density of water ρ_w = 1 g cm^{-3}
Mass of substance m = 50 g
Volume of substance v = 20 cm^3
∴Density of substance ρ_s = m/v = 50g/ 20cm^3 = 2.5 g cm^{-3} 1

As the density of the substance is greater than that of water, the given substance will sink in water. 1

Ans. 9. (a) Monocots have one cotyledon where as Dicots have two cotyledons. 1
(b)Bryophytes are called amphibians amongst plants because they live in damp areas as:
i. The plant body of bryophytes is devoid of vascular tissues, roots, etc. ½
ii. Like amphibians of animal kingdom, the sperms require an external supply of water for swimming and reaching the eggs for fertilizing the same. ½

Ans.10. (a) CFC's (Chloro fluoro carbons) 1
(b) The different states in which water is found during the water cycle are liquid (water), gas (water vapour) and solid (snow). 1

Ans.11.
(a) Biotic components – plants and animals any one; ½
Abiotic components – air and water. any one;½
(b) Any physical, chemical or biological change in the quality of water that makes it unsuitable for use and affects the living organisms adversely is called water pollution. 1

Ans. 12. (a) The apparent loss in weight of solid in liquid = weight in air - weight in liquid = 0.100 - 0.08 = 0.02 kgf 1
(b) Apparent loss in weight of solid in water = weight in air - weight in water
= 0.100 - 0.075
= 0.025 kgf 1

Ans.13. Similarity: Both fungi and plant cell have an outermost covering of cell wall. 1

Difference
- In fungi cell wall is made up of Chitin. ½
- In plants cell wall is made up of Cellulose. ½

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Ans.14.

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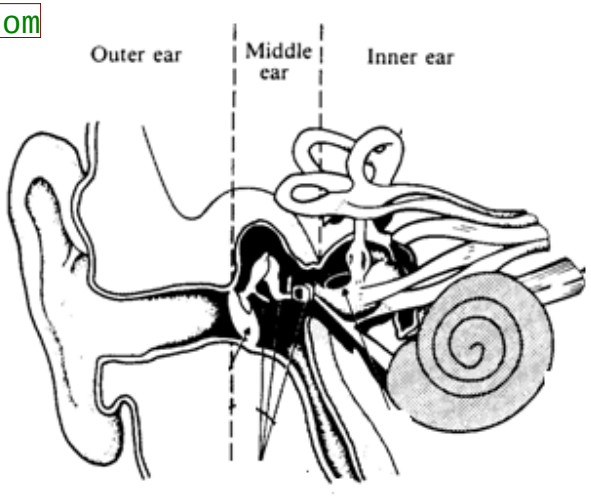

1 mark for each correct labelling

15. Given mass of man = 50 kg
Total height through which the man climbs = 30 steps ×20 cm
= 600 cm = 6 m 1
time taken = 30 seconds
Increase in potential energy
U = mgh
U = 50 × 10 × 6 = 3000 J 1
Power used $= \frac{U}{t} = \frac{3000}{30} = 100\,W$

or $P = \frac{100}{1000} = 0.1\,kW$

1

16. a. Speed of sound through air: 346 m/s
Speed of sound through aluminium : 6420 m/s

$$t_{al} = \frac{L}{6420}\ sec$$

$$t_{air} = \frac{L}{346}\ sec$$

$$\frac{t_{al}}{t_{air}} = \frac{346}{6420}$$

2

b. If the time interval between direct and the reflected sound is less than 0.1 s, it mingles with the direct sounds and the human ear will be unable to distinguish between the two. 1

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Ans. 17.

(a) Edward Jenner 1

(b)Antibiotic is a chemical substance that kills pathogens. They are secreted by microorganisms like fungi and bacteria. 1

Example- Penicillin and streptomycin. ½ , ½

Ans. 18. (a)

(i) It represents the name of the element. ½

(ii) It represents one atom of the element. ½

(b) One atomic mass unit is the mass unit equal to exactly one – twelfth the mass of one atom of carbon - 12. 1

(c) Because the size of an atom is too small. 1

Ans. 19. ½ * 6

(i) Calcium nitrate

Ca NO_3

2 1

Formula : $Ca(NO_3)_2$

Lead acetate

Pb CH_3COO

2 1

Formula : $(CH_3COO)_2Pb$

(Iii) Barium chloride

Ba Cl

2 1

Forrmula : $BaCl_2$

Sillica (Silicon dioxide)

Si O

4 2

Formula : SiO_2

(v) Phosphine

P H

3 1

Formula : PH_3

Baking soda (Sodium bicarbonate)

Na HCO_3

1 1

Formula : $NaHCO_3$

Ans. 20. (a) i. Infectious diseases or communicable diseases ½

ii. Congenital diseases ½

iii. Acute diseases ½

iii. Chronic diseases ½

(b) The process of injecting killed or attenuated microbes in order to activate the immune system against disease causing microbes to prevent from diseases is vaccination. 1

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Ans 21. (a) Notochord is the chordate character which has evolved as vertebral column in higher vertebrates. 1 s

Notochord is an elastic, solid, flexible rod like structure lying below the nerve cord and above the alimentary canal. It is found in all the embryos of chordates that forms the supporting axis of the body. 1

In diploblastic organisms only to germ layers are present endoderm and ectoderm. In them mesoderm is absent. So they do not have coelom. 1

Ans. 22. (a)

(i) Vectors: Organisms which carry disease causing organism from person to person. Pathogen completes some part of its life cycle in vector's body. Example: Mosquito. 1

(ii) Carrier: Organisms which carry pathogens from one person to another. Pathogens are not able to complete their life cycle in carriers. Example: Housefly 1

(b) Modes of transmission of AIDS are:

(i) Blood transfusion ½

(ii) Unprotected sexual contact. ½

Ans. 23. (a) The change of one form of energy into other form of energy is called transformation of energy.

1

Examples:

1. An electric motor converts electrical energy into mechanical energy.
2. A cell or a battery converts chemical energy into electrical energy. ½ *2

(b) Given, mass of body (m) = 2 Kg

K.E. = 25 J

Velocity (v) =?

K.E. = ½ mv^2

25 = ½ x 2 x v^2

v^2 = 25

v = 5 m/s 1

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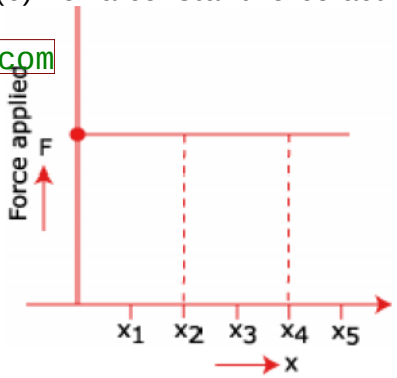
(c) For a constant force acting on the body producing a motion along a straight line,



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The significance of F-x graph:
The area enclosed by the graph and the position axis gives the total work done on the body.
For instance, work done during the motion from x_2 to x_4 is
$W = F \times (x_4 - x_2)$
$W = F \times \Delta x$
Here Δx represents the displacement undertaken. 1

OR

(a) The energy possessed by a body by the virtue of its position or shape is called potential energy.

1

Examples:

1. Water stored in a dam has potential energy. 1/2

2. A stone lying on the roof of the building. 1/2

(b) Given that
$KE_1 = KE_2$

$$\text{or } \frac{1}{2} m_1 u_1^2 = \frac{1}{2} m_2 u_2^2$$

force applied $F_1 = F_2 = F$ is same to bring them to rest.

If time taken to stop the masses m_1 and m_2 are t_1 and t_2 respectively, the retardation produced in each case is,

$$a_1 = \frac{u_1}{t_1} \text{ and } a_2 = \frac{u_2}{t_2}, \text{ respectively.}$$

Also $F = m_1 a_1 = m_2 a_2$

$$\Rightarrow a_1 = \frac{F}{m_1} \text{ and } a_2 = \frac{F}{m_2}$$

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Substituting for a_1 and a_2.

$$a_1 = \frac{F}{m_1} = \frac{u_1}{t_1}$$

$$\text{and } a_2 = \frac{F}{m_2} = \frac{u_2}{t_2}$$

1

$$\Rightarrow t_1 = \frac{u_1 m_1}{F} \text{ and } t_2 = \frac{u_2 m_2}{F}$$

$$\Rightarrow \frac{t_1}{t_2} = \frac{u_1 m_1}{u_2 m_2}$$

1

From $\frac{1}{2} m_1 u_1^2 = \frac{1}{2} m_2 u_2^2$

$$\frac{u_1}{u_2} = \sqrt{\frac{m_2}{m_1}}$$

Hence $\frac{t_1}{t_2} = \frac{m_1}{m_2}\sqrt{\frac{m_2}{m_1}} = \sqrt{\frac{m_2}{m_1} \times \frac{m_1^2}{m_2^2}}$

$$\frac{t_1}{t_2} = \sqrt{\frac{m_1}{m_2}}$$

as $m_1 > m_2$

$t_1 > t_2$

$\Rightarrow$ heavier body will take longer to stop than the lighter body. 1

Ans.24 (a)). An increase in the percentage of carbon dioxide in the atmosphere would cause the average temperature of the world go up leading to global warming. 1

(b) (i) Biogeochemical cycle or nutrient cycle is a pathway by which a chemical element or molecule moves through both biotic (biosphere) and abiotic (lithosphere, atmosphere, and hydrosphere) compartments of earth. 1

Some of the biogeochemical cycles are water cycle, nitrogen cycle, carbon cycle, sulphur cycle, phosphorous cycle. (Any two, ½, ½)

(ii) Nitrogen cycle is considered as the perfect cycle in nature because overall amount of nitrogen in atmosphere and water bodies is maintained. 1

Use of chemical fertilizers also maintains its concentration in the biosphere. Nothing is lost, hence nitrogen cycle is considered as a perfect cycle. 1

Or

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(a)

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(i) Two agents of soil erosion are:

a) Water ½

b) Wind ½

(ii) The following steps are used to control soil erosion:

a) Grazing of animals should be prevented. 1

b) Prevention of deforestation and increase of afforestation. 1

(b) Following changes will take place in the water cycle of that area:

a. It will cause reduction in the rainfall of that area.

b. It will lower down the level of water table of that area.

c. There will be frequent floods in that area leading to soil erosion.

d. Temperature of that area will increase.

(any two, 1 X2=2)

25 (a) "The arrangements of electrons in different orbits around the nucleus in an atom is called the electronic configuration of the element".

The following general rules used to right the electronic configuration of an element are:

(i) The shells of energy levels are represented by circles. Electrons are filled in order of increasing energy levels of shells. e.g, first K, then L, and then M and so on. 1

(ii) The maximum number of electrons which can be accommodated in any shell is $2n^2$ where n is the shell number 1

(iii) The outermost shell cannot accommodate more than eight electrons, even if if it has the capacity to accommodate more electrons. 1

(b) Atomic number = 11

Mass number = 23

∴ Number of protons = 11 1/2

Number of electrons = 11

Mass number = P + N 1/2

23 = 11 + N 1/2

N = 23 – 11 = 12 1/2

Or

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(a) Let isotope $^{16}_{8}X$ is a%, hence isotope $^{18}_{8}X$ is 100 – a%. 1/2

Average atomic mass = $\frac{16 * a + 18 \times (100 - a)}{100}$ 1/2

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$16.2 = \frac{16a + 1800 - 18a}{100}$ 1/2

$1620 = -2a + 1800$ 1/2

$2a = 1800 - 1620$

$2a = 180$ 1/2

$a = 90$ 1/2

Hence, isotope $^{16}_{8}X$ is 90 % and isotope $^{18}_{8}X$ is 10 %

(b)

Element	Atomic Number	Mass Number	Protons	Neutrons	Electrons
A	11	23	11	12	11
B	17	35	17	18	17
C	9	19	9	10	9
D	10	20	10	10	10

2

SECTION B

16 x 1 = 16

26.d
27.c
28.a
29.b
30.d
31.a
32.b
33.d
34.a
35.d
36.c
37.c
38.c
39.b
40.c
41.a

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