



### Class 11<sup>th</sup> (PCB)

Total Questions : 90

Maximum Marks : 360

Time : 3 Hrs.

#### PAPER PATTERN & MARKING SCHEME

Subject	Physics		Chemistry		Biology
Question type	MCQ	INT	MCQ	INT	MCQ
No. of ques.	20	10	20	10	30
Marks per ques.	4	4	4	4	4
Negative marks per ques.	1	0	1	0	1
"SCQ - Single correct answer type questions & INT - Integer answer					

#### INSTRUCTIONS – 1:

- The question paper consists of **3 parts (1. Physics 2. Chemistry 3. Biology)**. Please fill the **OMR** answer Sheet accordingly and carefully.
- This questions paper contains **70 single correct type questions** and **20 Integer answer type questions**.
- Please ensure that the Question Paper you have received contains All the questions in each Section and Pages. If you found some mistake like missing questions or pages then contact immediately to the Invigilator.

#### INSTRUCTIONS – 2:

- Part – 1 & 2 contains 20 **Single correct type questions** and 10 **Integer type questions**.
- Part – 3 contains 30 **Single correct type questions**.
- Indicate the correct answer for each question by filling appropriate bubble in your answer sheet.
- Use of Calculator, Log Table, Slide Rule and Mobile is not allowed.

**OMR filling instructions for SCQ.**

**OMR filling instructions for INT.**

**INSTRUCTIONS**

- "Think before your ink".
- Marking should be done with Blue/Black Ball Point Pen only.
- Darken only one circle for each question as shown in Example Below.

<b>WRONG METHODS</b>	<b>CORRECT METHOD</b>

- If more than one circle is darkened or if the response is marked in any other way as shown "WRONG" above, it shall be treated as wrong way of marking.
- Make the marks only in the spaces provided.
- Carefully tear off the duplicate copy of the OMR without tampering the Original.
- Please do not make any stray marks on the answer sheet.

<b>Q. 1</b>	<b>Q. 2</b>
47	05

#### MATRIX OLYMPIAD FOUNDATION

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911

Website : [www.mof.matrixedu.in](http://www.mof.matrixedu.in) ; Email : [info@matrixedu.in](mailto:info@matrixedu.in)

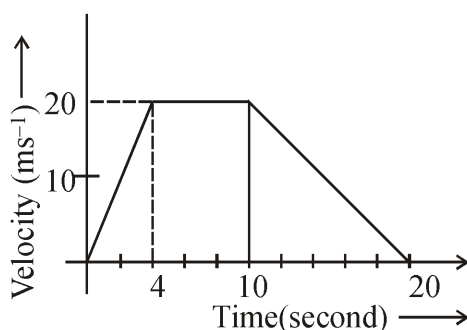


Part – 1 contains 20 Single correct type questions and 10 Integer type questions.

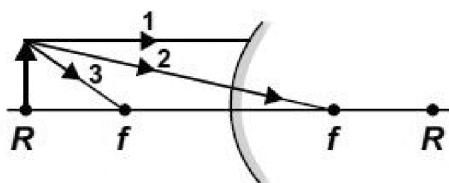
Question No. 1 – 20 are of Single Correct Answer Type Question.

Four options are given in each question out of which only one option is correct.

1. The figure represents the velocity-time graph of body moving in a straight line. How much distance does it travel during the last 10 seconds ?



- (A) 40 m                      (B) 80 m                      (C) 100 m                      (D) 220 m
2. Which pairs of rays from the object in the drawing are used to construct the image location produced by the convex spherical mirror of focal length  $f$  and radius  $R$ ?



- (A) 1 and 3  
(B) 1 and 2  
(C) 2 and 3  
(D) Any pair of rays can be taken among shown

*Space for Rough Work*



3. Match the Column I with Column II.

Column I

(a) Geothermal energy

(b) Nuclear energy

(c) Biomass energy

(A) (a)-(i), (b)-(iii), (c)-(ii)

(C) (a)-(iii), (b)-(ii), (c)-(i)

Column II

(i) Obtained from the splitting of atom

(ii) Obtained from the interior of earth

(iii) Obtained from the decay of organic matter

(B) (a)-(ii), (b)-(i), (c)-(iii)

(D) (a)-(i), (b)-(ii), (c)-(iii)

4. Two bodies of masses  $m_1$  and  $m_2$  are dropped from heights  $h_1$  and  $h_2$  respectively. On reaching the ground they acquire equal momenta. If  $h_1 > h_2$ , the ratio of kinetic energy of  $m_1$  to that of  $m_2$  on reaching the ground will be:

(A) Equal to 1

(B) Greater than 1

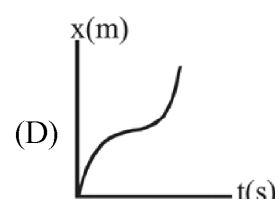
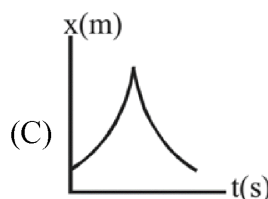
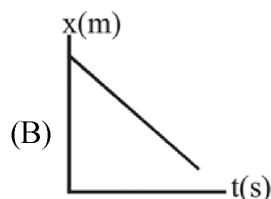
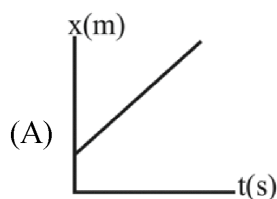
(C) Less than 1

(D) Data is insufficient

5. The position of an object in equal time intervals is shown in figure.



Which graph below correctly represents position versus time for this object ?



6. As the frequency of a source decreases in a given medium, the wavelength of a periodic longitudinal wave

(A) increases, but the speed of the wave remains constant.

(B) increases, and the speed of the wave increases.

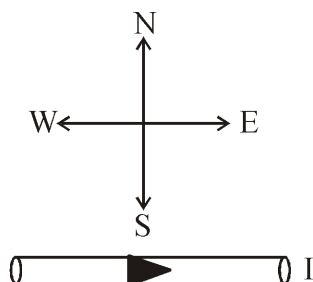
(C) decreases, but the speed of the wave remains constant.

(D) decreases, and the speed of the wave decreases.

*Space for Rough Work*



7. A constant current  $I$  flows in a horizontal wire in the plane of the paper from west to East as shown in the figure. The direction of magnetic field at a point will be South to North :

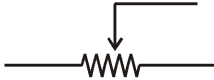


- (A) Directly above the wire  
(B) Directly below the wire  
(C) At a point located in the plane of the paper on the north side of the wire  
(D) At a point located in the plane of the paper, on the south side of the wire
8. Neglecting the rotation of the earth, if suddenly the attractive power of the earth drops to Zero, a man standing on the earth will .....
- (A) Fly up  
(B) Slide along the surface  
(C) Move out tangentially  
(D) Stand unaffected

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*Space for Rough Work*



9. According to law of floatation weight of a floating body is –  
(A) Equal to the weight of liquid displaced  
(B) Equal to the volume of liquid displaced  
(C) Is greater than the weight of liquid displaced  
(D) Is less than the weight of liquid displaced
10.  this symbol represents :  
(A) Galvanometer (B) Fixed resistance (C) Rheostat (D) Filament bulb
11. Two heater wires of equal length are first connected in series and then in parallel with a battery. The ratio of heat produced in the two cases is :  
(A) 2 : 1 (B) 1 : 2 (C) 4 : 1 (D) 1 : 4
12. A current carrying power line carries current from west to east. What will be the direction of magnetic field 1m above it ?  
(A) North to south (B) South to west (C) East to west (D) West to east
13. A wire of length 0.04m is placed perpendicular to a uniform magnetic field of magnitude 0.30 T. Calculate the force on the wire when the current flowing through it is 5.0 A.  
(A) 10 N (B) 0.06 N (C) 0.01 N (D) 0.02 N

*Space for Rough Work*



14. A convex lens forms a virtual image when an object is placed at a distance of 18 cm from it. The focal length must be :  
(A) greater than 36 cm (B) greater than 18 cm (C) less than 36 cm (D) less than 18 cm
15. An object is placed before a concave lens. The image formed :  
(A) is always erect (B) may be real or virtual  
(C) is always virtual (D) is always erect
16. When white light passes through a prism, it splits into its component colours. This phenomenon is called-  
(A) spectrum (B) reflection (C) refraction (D) dispersion
17. The number of surfaces bounding a prism is :  
(A) 3 (B) 4 (C) 5 (D) 6
18. A deviation in the path of a ray of light can be produced :  
(A) by a glass prism but not by a rectangular glass slab  
(B) by a rectangular glass slab but not by a glass prism  
(C) by a glass prism as well as a rectangular glass slab  
(D) neither by a glass prism nor by a rectangular glass slab
19. A solar cell convert heat and light energy into :  
(A) heat energy (B) sound energy (C) electrical energy (D) nuclear energy
20. Choose the source of energy which is different from others :  
(A) Wood (B) Falling water (C) Wind (D) Petroleum

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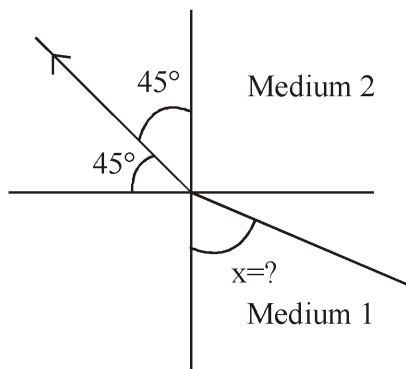
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**Question No. 21 – 30 are of Integer Answer Type Question.**

Answer of these question will come from **00** to **99**.

21. Two metallic wires A and B are connected in series. Wire A has length  $l$  and radius  $r$ , while wire B has length  $2l$  and radius  $2r$ . If both the wires are of same material then find the ratio of the total resistance of series combination to the resistance of the wire A.
22. Figure shows a ray of light as it travels from medium 1 to medium 2. If refractive index of medium 1 with respect to medium 2 is  $\frac{\sqrt{2}}{\sqrt{3}}$  then the value of angle  $x$  is :

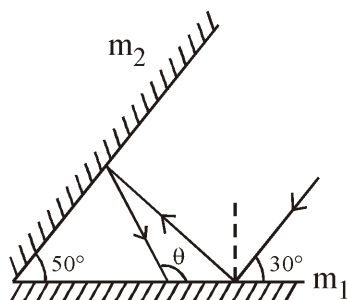


23. If the current through a resistor is increased by 50% the increase in power dissipated will be (assume the temperature remains constant)
24. A boy is rotating in a circular motion, a stone of mass 500 gm by using a string of length 50 cm with a speed 10 cm/s. What will be the work done by the force applied by the boy.

*Space for Rough Work*



25. To convert temperature in  $^{\circ}\text{F}$  into  $^{\circ}\text{C}$  we use the formula –
26. What is heterogeneous medium, explain.
27. According to given figure what angle does the reflected ray from mirror  $m_2$ , make with mirror  $m_1$  ?



28. Calculate the work done in taking a charge of  $0.02\text{C}$  from A to B. if the potential at A is  $20\text{V}$ , and that at B is  $30\text{V}$ .
29. A  $6\text{V}$  battery is connected across a  $5\Omega$  resistor. Calculate the current passing through the resistor.
30. In an experiment, the current flowing through a resistor and the potential difference across it are measured. The values are given below. Show that these values confirm Ohm's law, and find the resistance of the resistor.

$i$ (ampere)	1.0	1.5	2.0	2.5	3.0
$V$ (volt)	4.0	6.0	8.0	10.0	12

*Space for Rough Work*





Part – 2 contains 20 Single correct type questions and 10 Integer type questions.

Question No. 31 – 50 are of Single Correct Answer Type Question.

Four options are given in each question out of which only **one** option is correct.

31. Which of the following is responsible for the blackening of silver jewellery on prolonged exposure to air ?  
(A) Ag<sub>3</sub>N                      (B) Ag<sub>2</sub>O                      (C) Ag<sub>2</sub>S and Ag<sub>3</sub>N                      (D) Ag<sub>2</sub>S
32. The value of x and y in the following reaction is ....  
 $x \text{CaCO}_3 + y \text{H}_3\text{PO}_4 \rightarrow \text{Ca}_3(\text{PO}_4)_2 + x\text{H}_2\text{O} + x \text{CO}_2$   
(A) 2, 3                      (B) 3, 3                      (C) 3, 2                      (D) 1, 3
33. Identify x in the following reaction  
 $\text{CH}_3 - \text{CH}_2 - \text{OH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{Hot, Conc.}} (\text{X}) + \text{H}_2\text{O}$   
(A) Ethane                      (B) Methane                      (C) Ethene                      (D) Ethanol
34. Which of the following is a straight chain hydrocarbon ?  
(A)  $\begin{array}{c} \text{CH}_3 - \text{CH}_2 \\ | \\ \text{CH}_3 - \text{CH} - \text{CH}_3 \end{array}$                       (B)  $\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$   
(C)  $\begin{array}{c} \text{CH}_3 \qquad \qquad \text{CH}_3 \\ | \qquad \qquad \qquad | \\ \text{CH}_2 - \text{CH}_2 - \text{CH} - \text{CH}_2 \\ | \\ \text{CH}_3 \end{array}$                       (D)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 \\ | \\ \text{CH}_3 \end{array}$
35. The correct order increasing acidic nature of SO<sub>2</sub>, SiO<sub>2</sub>, P<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub> is -  
(A) Al<sub>2</sub>O<sub>3</sub> < SiO<sub>2</sub> < P<sub>2</sub>O<sub>3</sub> < SO<sub>2</sub>                      (B) SO<sub>2</sub> < P<sub>2</sub>O<sub>3</sub> < SiO<sub>2</sub> < Al<sub>2</sub>O<sub>3</sub>  
(C) Al<sub>2</sub>O<sub>3</sub> < SiO<sub>2</sub> < P<sub>2</sub>O<sub>3</sub> < SO<sub>2</sub>                      (D) SiO<sub>2</sub> < SO<sub>2</sub> < Al<sub>2</sub>O<sub>3</sub> < P<sub>2</sub>O<sub>3</sub>

*Space for Rough Work*



36. Cl, Br, I, If this is a Dobereiner's triad and the atomic masses of Cl and I are 35.5 and 127 respectively. Then the atomic mass of Br is :
- (A) 162.5                      (B) 91.5                      (C) 81.25                      (D) 45.625
37. Corrosion of silver occurs due to the formation of -
- (A) Ag<sub>2</sub>O                      (B) AgCl                      (C) Ag<sub>2</sub>CO<sub>3</sub>                      (D) Ag<sub>2</sub>S
38. Identify the correct oxidant and reductant in the following reaction ?
- $$\text{PbS} + 4\text{H}_2\text{O}_2 \rightarrow \text{PbSO}_4 + 4\text{H}_2\text{O}$$
- (A) PbS - oxidant, H<sub>2</sub>O<sub>2</sub> - Reductant                      (B) PbS - Reductant PbSO<sub>4</sub> - Oxidant  
(C) PbS - Reductant, H<sub>2</sub>O<sub>2</sub> - Oxidant                      (D) H<sub>2</sub>O<sub>2</sub> - Oxidant, H<sub>2</sub>O - Reductant
39. In the balanced chemical equation :
- a lead nitrate + b aluminium chloride → c aluminium nitrate + d lead chloride
- Which of the following alternative is correct ?
- (A) a = 1, b = 2, c = 2, d = 1                      (B) a = 4, b = 3, c = 3, d = 4  
(C) a = 2, b = 3, c = 2, d = 3                      (D) a = 3, b = 2, c = 2, d = 3
40. On reacting a compound of calcium X with water compound Y is obtained boiling with NH<sub>4</sub>Cl gas Z is obtained. X, Y and Z respectively are :
- (A) CaCO<sub>3</sub>, CaO, NH<sub>3</sub>                      (B) CaCO<sub>3</sub>, CaO, Cl<sub>2</sub>  
(C) CaO, CaCl<sub>2</sub>, Cl<sub>2</sub>                      (D) CaO, Ca(OH)<sub>2</sub>, NH<sub>3</sub>
41. Which on of the following reaction is not possible :
- (A) Ca + H<sub>2</sub>SO<sub>4</sub> → CaSO<sub>4</sub> + H<sub>2</sub>                      (B) Cu + H<sub>2</sub>SO<sub>4</sub> → CuSO<sub>4</sub> + H<sub>2</sub>  
(C) Zn + H<sub>2</sub>SO<sub>4</sub> → ZnSO<sub>4</sub> + H<sub>2</sub>                      (D) Mg + H<sub>2</sub>SO<sub>4</sub> → MgSO<sub>4</sub> + H<sub>2</sub>

*Space for Rough Work*



42. Sodium Bicarbonate on decomposition forms :
- (A)  $\text{NaHCO}_3$                       (B)  $\text{Na}_2\text{CO}_3$                       (C)  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$                       (D)  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
43. The pH value of the three solution X, Y and Z are 6, 4 and 8 respectively. Which of the following is the correct order of decreasing acidic strength ?
- (A)  $X > Y > Z$                       (B)  $Z > Y > X$                       (C)  $Z > X > Y$                       (D)  $Y > X > Z$
44. Arrange the following metals in the order of their decreasing reactivity ?  
Fe, Cu, Mg, Ca, Zn, Ag
- (A)  $\text{Ca} > \text{Zn} > \text{Mg} > \text{Cu} > \text{Ag} > \text{Fe}$                       (B)  $\text{Ca} > \text{Zn} > \text{Cu} > \text{Mg} > \text{Ag} > \text{Fe}$   
(C)  $\text{Ca} > \text{Mg} > \text{Zn} > \text{Fe} > \text{Cu} > \text{Ag}$                       (D)  $\text{Ca} > \text{Mg} > \text{Fe} > \text{Zn} > \text{Cu} > \text{Ag}$
45. A metal X is placed below Al and above Pb. The extraction of metal is done by reacting carbon with its oxide. Metal oxide is used to join cracks of Machine parts and rail line by reacting it with Al. The metal is :
- (A) Zn                      (B) Cu                      (C) Fe                      (D) Mg
46. Which of the following series represent only unsaturated hydrocarbons ?
- (A)  $\text{C}_2\text{H}_6, \text{C}_3\text{H}_8, \text{C}_4\text{H}_{10}$                       (B)  $\text{C}_2\text{H}_6, \text{C}_3\text{H}_6, \text{C}_4\text{H}_{10}$   
(C)  $\text{C}_2\text{H}_4, \text{C}_3\text{H}_6, \text{C}_4\text{H}_6$                       (D)  $\text{C}_2\text{H}_4, \text{C}_3\text{H}_8, \text{C}_4\text{H}_6$

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*Space for Rough Work*



47. What is IUPAC name of the following compound ?



- (A) 2-amino pent-3-enoic acid                      (B) 4-amino pent-2-enoic acid  
(C) 3-ene-2-amino pentanoic acid                (D) 2-ene-4-amino pentanoic acid
48. A hydrocarbon having one double bond has 100 carbon atoms in its molecule. The number of hydrogen atoms in its molecule will be :  
(A) 196                      (B) 198                      (C) 200                      (D) 202
49. An element 'X' has six electrons in the 'M' shell. It belongs to :  
(A) 3<sup>rd</sup> period, 16<sup>th</sup> group                      (B) 2<sup>nd</sup> period, 14<sup>th</sup> group  
(C) 3<sup>rd</sup> period, 13<sup>th</sup> group                      (D) 2<sup>nd</sup> period, 15<sup>th</sup> group
50. Soaps are sodium salt of fatty acids.  $\text{RCOONa}$ , e.g.  $\text{C}_{17}\text{H}_{35}\text{COO}^-\text{Na}^+$ . It gives an insoluble precipitate / layer with  
(A)  $\text{Ca}^{2+}(\text{aq})$                       (B)  $\text{Mg}^{2+}(\text{aq})$   
(C) Both (A) & (B)                      (D) None of these

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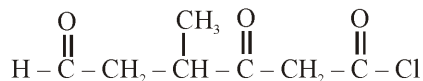
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Question No. 51 – 60 are of Integer Answer Type Question.

Answer of these question will come from 00 to 99.

51. The equation  $\text{Cu} + x \text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + y \text{NO}_2 + 2\text{H}_2\text{O}$ . The value of  $x + y$  is ?
52.  $10^{-3}$  mole of KOH is added to 10 litres of pure water at  $25^\circ\text{C}$ . The pH will change by (assume no change in volume occurs)
53. No. of valence electrons in an element  ${}_{17}\text{X}$  is ?
54. How many isomers are possible for an alkane having molecular formula  $\text{C}_6\text{H}_{14}$  ?
55. Total No. of C – H bonds in propane ( $\text{C}_3\text{H}_8$ ) molecule is ?
56. How many organic acid in given acids ?  
(i) HCl                      (ii)  $\text{H}_2\text{SO}_4$                       (iii)  $\text{HNO}_3$                       (iv)  $\text{H}_2\text{CO}_3$                       (v)  $\text{H}_3\text{PO}_4$
57. In balanced chemical equation  $a \text{Cu} + b \text{HNO}_3 (\text{dil}) \rightarrow c \text{Cu}(\text{NO}_3)_2 + d \text{H}_2\text{O} + e \text{NO}$ . Find the value of  $a + c + e$  is ?
58. Calculate the number of moles in 72g of water ?
59. How many dibasic acid are present in given acids ?  
(i)  $(\text{COOH})_2$                       (ii)  $\text{HCOOH}$                       (iii)  $\text{CH}_3\text{COOH}$                       (iv)  $\text{HBr}$                       (v)  $\text{HCl}$   
(vi)  $\text{HNO}_3$                       (vii)  $\text{H}_2\text{CO}_3$                       (viii)  $\text{Hf}$                       (ix)  $\text{H}_2\text{SO}_3$  (x)  $\text{H}_3\text{PO}_4$  (xi)  $\text{H}_2\text{SO}_4$
60. How many functional group present in given compound.



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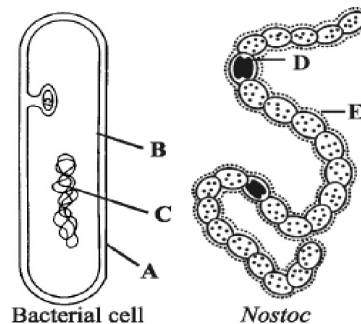


**Part – 3 contains 30 Single correct type questions**

**Question No. 61 – 90 are of Single Correct Answer Type Question.**

**Four options are given in each question out of which only one option is correct.**

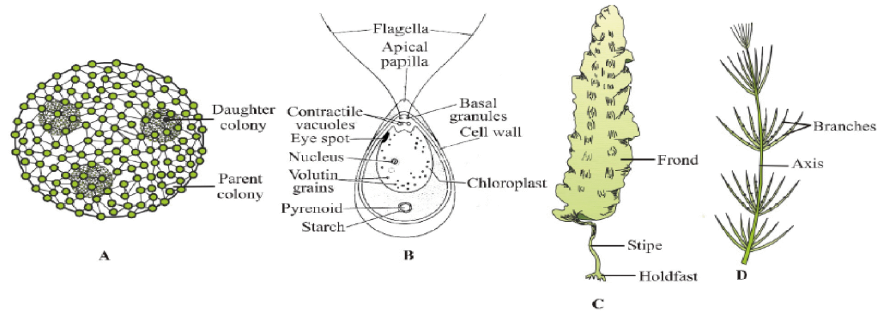
61. Which of the following are unique features of living organisms?
- (A) Growth and reproduction (B) Reproduction and ability to sense environment  
(C) Metabolism and interaction (D) All of the above
62. Which of the following characteristic(s) is/are used by Whittaker for the classification of organisms ?
- (A) Mode of nutrition (B) Thallus organisation  
(C) Phylogenetic relationships (D) All of the above
63. Refer to the given figures of bacteria cell and *Nostoc* and choose the option which shows correct label for the structures marked as A, B, C, D and E ?



- (A) A – Cell wall, B – Cell membrane, C – Heterocyst, D – DNA, E – Mucilaginous sheath  
(B) A – Cell wall, B – Cell membrane, C – DNA, D – Heterocyst, E – Mucilaginous sheath  
(C) A – Mucilaginous sheath, B – Cell membrane, C – DNA, D – Heterocyst, E – Cell wall  
(D) A – Cell membrane, B – Cell wall, C – DNA, D – Heterocyst, E – Mucilaginous sheath

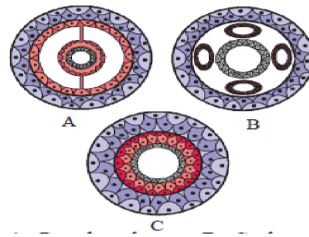
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64. Refer to the given figure (A, B, C and D) and answer the question. Which of the following figures are the members of green alga?



- (A) A, B and D      (B) A, B and C      (C) B, C and D      (D) C, D and A

65. Identify the figures and select the correct option.

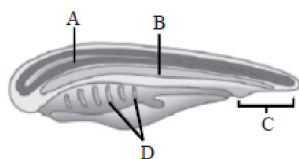


- (A) A - Pseudocoelomate; B - Coelomate, C-Acoelomate  
 (B) A - Coelomate, B - Pseudocoelomate, C-Acoelomate  
 (C) A - Coelomate; B- Acoelomate; C - Pseudocoelomate  
 (D) A - Coelomate; B- Acoelomate; C-Euocoelomate

*Space for Rough Work*



66. The given figure shows some characteristic features marked as chordates. Identify the correct labelling A,B,C and D.



- (A) A-Notochord; B-Post-anal part; C-Gill slits; D-Nerve cord  
(B) A-Nerve cord; B-Notochord; C-Post-anal part; D-Gill slits  
(C) A-Notochord; B-Nerve cord; C-Gill slits; D-Post-anal part  
(D) A-Gill slits; B-Post-anal part; C-Nerve cord; D Notochord
67. Identify the different types of aestivation (A, B, C and D) in corolla and select the correct option.



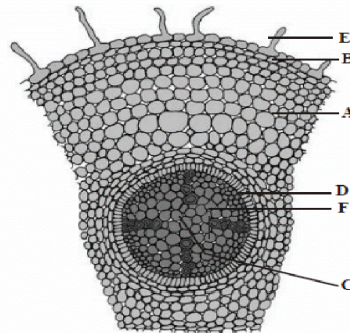
- (A) A-Valvate, B-Twisted, C-Imbricate, D-Vexillary  
(B) A-Vexillary, B-Valvate, C-Twisted, D-Imbricate  
(C) A-Imbricate, B-Vexillary, C-Valvate, D-Twisted  
(D) A-Twisted, B-Imbricate, C-Vexillary, D-Valvate

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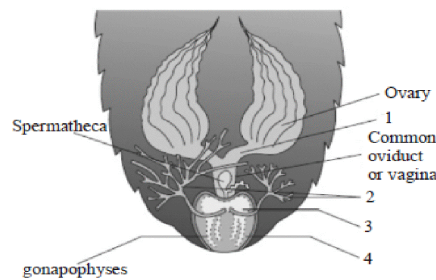




68. The given figure shows the T.S of dicot root. Some parts are marked as A, B, C, D, E, & F. Choose the option which shows the correct labelling of marked part.



- (A) A – Epiblema, B – Root hair, C – Cortex, D – Endodermis, E – Pith, F – Pericycle  
(B) A – Cortex, B – Pith, C – Epiblema, D – Endodermis, E – Root hair, F – Pericycle  
(C) A – Epiblema, B – Endodermis, C – Cortex, D – Root hair, E – Pith, F – Pericycle  
(D) A – Cortex, B – Epiblema, C – Pith, D – Endodermis, E – Root hair, F – Pericycle
69. Refer the given figure of female reproductive system of cockroach and identify the correct labels (marked as 1, 2, 3 and 4) which are collectively called genital pouch.

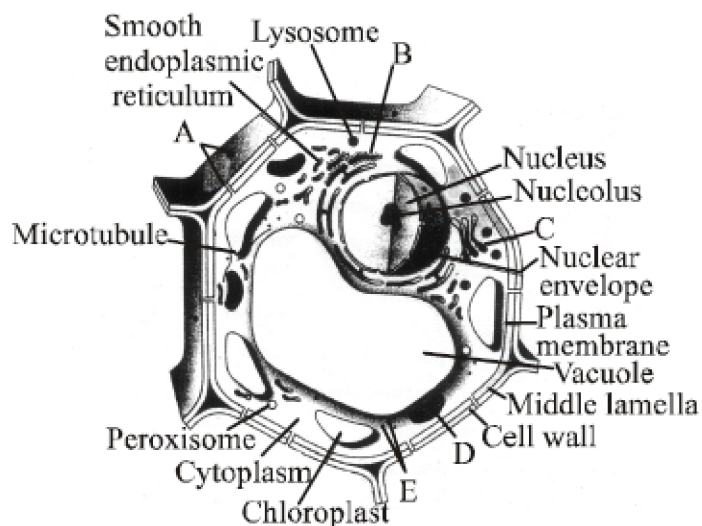


- (A) 1 & 2                      (B) 1 & 3                      (C) 2 & 4                      (D) 3 & 4

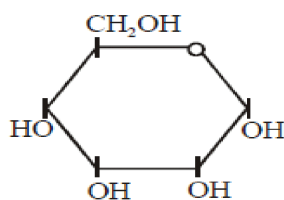
*Space for Rough Work*



70. The following diagram shows some of the missing structures in a plant cell marked as A, B, C, D and E. Choose the option with their correct names.



- (A) A - Plasmodesmata, B - Rough endoplasmic reticulum, C - Golgi apparatus, D - Mitochondrion, E - Ribosomes  
 (B) A - Desmosome, B - Rough endoplasmic reticulum, C - Golgi apparatus, D - Mitochondrion, E - Ribosomes  
 (C) A - Plasmodesmata, B - Smooth endoplasmic reticulum, C - Golgi apparatus, D - Mitochondrion, E - Ribosomes  
 (D) A - Tight junction, B - Rough endoplasmic reticulum, C - Golgi apparatus, D - Mitochondrion, E - Ribosomes
71. The structural formula given below belongs to

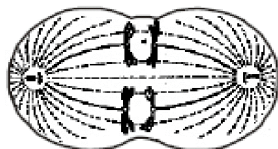


- (A) glucose                      (B) ribose                      (C) sucrose                      (D) deoxyribose

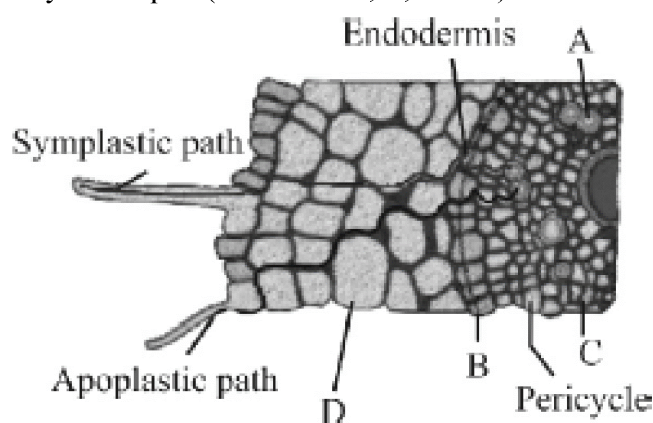
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72. The diagram shows a cell whose diploid chromosome number is four. Which one of the following option shows correct stage of cell ?



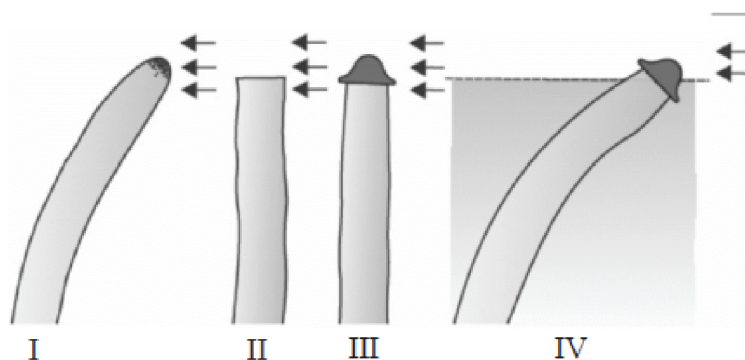
- (A) Metaphase  
(B) Anaphase of mitosis  
(C) Anaphase I of meiosis  
(D) Anaphase II of meiosis
73. The given figure represents symplastic and apoplastic pathways of water & ion absorption & movement in roots. Few parts are marked as A, B, C & D. At the endodermis, water movement through the apoplast pathway is obstructed by which part (marked as A, B, C & D)?



- (A) A                      (B) B                      (C) C                      (D) D

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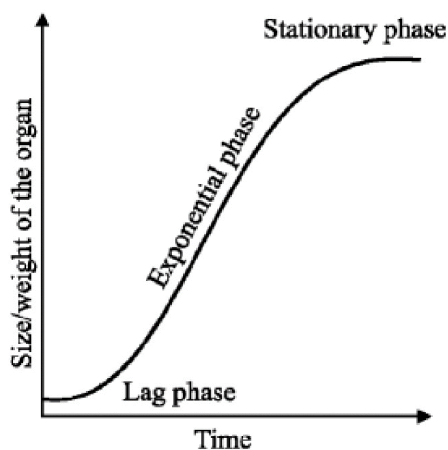
74. The following diagram shows four coleoptiles set up (I, II, III & IV) at the start of an experiment.



**Fig :** Experiment used to demonstrate that tip of the coleoptile is the source of auxin. Arrows indicate direction of light. Which two coleoptiles will both bend towards the light source?

- (A) I and II                      (B) I and IV                      (C) II and III                      (D) III and IV

75. The graph given below shows a geometrical growth rate.

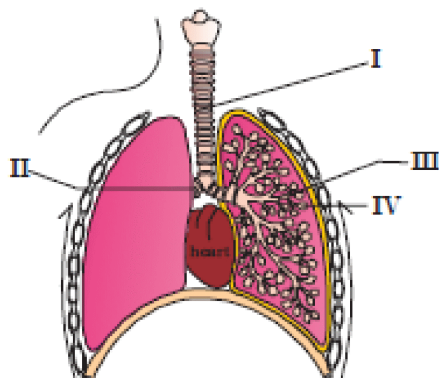


Which of the following statements regarding the above graph is incorrect?

- (A) The initial growth is slow, thereafter exponential phase and then stationary phase.  
 (B) A sigmoidal curve is a characteristic of living organisms growing in a natural environment.  
 (C) With limited nutrient supply, the growth rate increases rapidly leading to an exponential phase.  
 (D) Geometrical growth is typical for all cells, tissues and organs of a plant.

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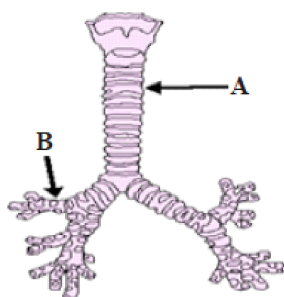
76. The given diagram represents the human respiratory system with few structures labelled as I, II, III and IV.



The exchange of gases takes place in which labelled structure?

(A) I → trachea      (B) II → Bronchi      (C) III → bronchioles      (D) IV → alveoli

77. In the given figure, label A represents \_\_\_\_\_ while label B represents \_\_\_\_\_.



(A) A- Trachea, B- Bronchus

(B) A- Alveolus, B- Bronchiole

(C) A- Bronchiole, B- Trachea

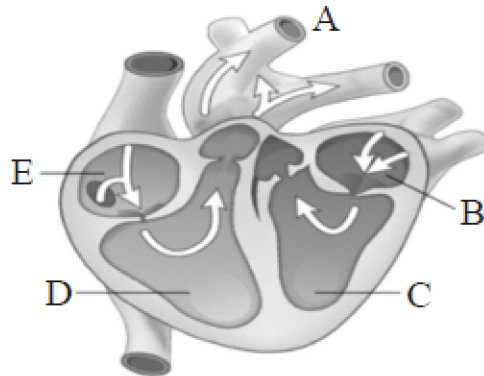
(D) A- Trachea, B- Bronchiole

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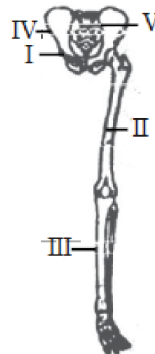
78. In the human heart, blood from the lungs enters the heart through the left atrium, pumps into the left ventricle, out the aorta and through the body, and then returns into the right atrium, pumps into the right ventricle and exits to the lungs.

Using the diagram, which set of letters (A, B, C, D, E) correctly represents the process describe above?



- (A) E, D, A, B, C      (B) B, C, A, E, D      (C) C, D, A, B, E      (D) D, C, A, E, B

79. The diagram given below shows the pelvic girdle and lower limb.

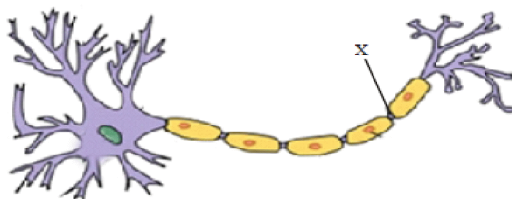


Parts labelled as 'I', 'II', 'III', 'IV' and 'V' respectively indicate

- (A) Ilium, Femur, Tibia, Pubis and Sacrum      (B) Pubis, Tibia, Femur, Ilium and Sacrum  
(C) Ilium, Femur, Tibia, Pubis and Sacrum      (D) Pubis, Femur, Tibia, Ilium and Sacrum

*Space for Rough Work*

80. What is the function of label X in the given diagram?



- (A) It speeds up the impulse transmission.  
(B) It provides electrical insulation.  
(C) It conducts impulse towards the nerve cell body  
(D) It is the functional unit of nerve.
81. Contribution of Ingen-Housz in elucidation of process of photosynthesis is that
- (A) only green parts of plants exposed to light can convert foul air ( $\text{CO}_2$ ) into pure air ( $\text{O}_2$ ).  
(B) green plants convert light energy into chemical energy  
(C) plants have the capacity to purify foul air.  
(D) sunlight is the ultimate source of energy for plants and animals.
82. Glycolysis occurs in the \_\_\_\_\_ and produces \_\_\_\_\_, which in the presence of  $\text{O}_2$  enters the \_\_\_\_\_.
- (A) cytosol; pyruvate; mitochondrion      (B) cytosol; glucose; mitochondrion  
(C) mitochondrion; pyruvate; chloroplast      (D) chloroplast; glucose; cytosol
83. The measure of the ability of the plant to produce new plant material is referred as —
- (A) efficiency index      (B) absolute growth rate  
(C) arithmetic growth      (D) linear growth

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*Space for Rough Work*



84. The innermost layer of the digestive tract is the  
(A) serosa membrane (B) mucosa membrane (C) submucosa membrane (D) lumen
85. Intercostal muscles are found attached with  
(A) diaphragm (B) ribs (C) pleura (D) lungs
86. What is true about leucocytes ?  
(A) Their sudden fall in number is indication of blood cancer  
(B) These are produced in thymus  
(C) These are enucleated  
(D) These can squeeze out through the capillary walls
87. Excretion of nitrogenous waste product in semi-solid form occur in  
(A) amniotes (B) desert animals (C) ureotelic animals (D) uricotelic animals
88. Striations in the striated muscles are due to  
(A) absence of myofilaments. (B) presence of myofilaments.  
(C) specialized arrangement of myofilaments. (D) projections of myosin.
89. During conduction of nerve impulse  
(A)  $\text{Na}^+$  moves into axoplasm (B)  $\text{Na}^+$  moves out of axoplasm  
(C)  $\text{K}^+$  moves into axoplasm (D)  $\text{Ca}^{++}$  moves into axoplasm
90. Oxytocin hormone is produced by  
(A) pituitary (B) adrenals (C) hypothalamus (D) thyroid

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*Space for Rough Work*