(d) 4

# MATHEMATICS

Α

- 1. If  $\frac{x^2 x + 1}{x^2 + x + 1} = \frac{2}{3}$  then the value of  $x + \frac{1}{x}$  is: (a) 6 (b) 5 (c) 8
- 2. If  $p^4 + q^4 + p^2q^2 = 273$  and  $p^2 + q^2 pq = 21$ , then one of the values of  $\left(\frac{1}{p} + \frac{1}{q}\right)$  is:

(a) 
$$-\frac{9}{4}$$
 (b)  $-\frac{3}{4}$  (c)  $\frac{9}{8}$  (d)  $\frac{3}{2}$ 

- 3. Let  $S_n$  be the sum of the first n terms of an A.P. If  $S_{3n} = 3S_{2n}$ , then the value of  $\frac{S_{4n}}{S_{2n}}$  is:
  - (a) 6 (b) 7 (c) 8 (d) 9
- 4. In a right angled  $\triangle ABC$ , a circle with side AB as diameter is drawn to intersect the hypotenuse AC at R. Given that, PQ is a tangent to the circle at R,  $\angle BAC = \theta$  and BP = 13 then the length of PC is:



- 5. The ratio of the monthly incomes of Vijay and Rakesh is 3 : 4 and the ratio of their monthly expenditures is 5 : 7. If the ratio of their monthly savings is 3 : 2 and Vijay saves ₹ 500 more than Rakesh per month, then the monthly income of Rakesh is:
  (a) ₹ 35000
  (b) ₹ 32000
  (c) ₹ 26000
  (d) ₹ 22000
- 6. Find the area of the shaded region, given that the radius of each circle is equal to 5 cm:



- (a)  $(400 100 \pi) \text{ cm}^2$  (b)  $(360 100 \pi) \text{ cm}^2$  (c)  $231 \text{ cm}^2$  (d)  $(400 50 \pi) \text{ cm}^2$ 7. The area of a triangle formed by the lines 4x - y - 8 = 0, 2x + y - 10 = 0 and y = 0 is: (a) 5 (b) 6 (c) 4 (d) 3
- 8. What is the probability that a leap year has 52 Mondays?
  - (a)  $\frac{2}{7}$  (b)  $\frac{4}{7}$  (c)  $\frac{5}{7}$  (d)  $\frac{6}{7}$
- **9.** Two bells toll in every 45 seconds and 60 seconds respectively. If they toll together at 8:00 am, then which of the following is the probable time at which they can toll together?
  - (a) 8:55 am (b) 8:50 am
  - (c) 8:45 am (d) 8:40 am



Let  $f_k(x) = \frac{1}{k} (\sin^k x + \cos^k x)$  for  $k = 1, 2, 3, \dots$ . Then for all the real values of x, the value of 10.  $f_6(x) - f_4(x)$  is equal to: (a)  $\frac{1}{12}$ (b)  $\frac{1}{4}$ (c)  $-\frac{1}{12}$ (d)  $\frac{5}{12}$ If  $15\sin^4\theta + 10\cos^4\theta = 6$  for some real values of  $\theta$ , then the value of  $27\sec^6\theta + 8\csc^6\theta$  is equal to: 11. (a) 350 (b) 500 (c) 400 (d) 250 Two vertical poles of heights, 20 m and 60 m stand apart on a horizontal plane. The height (in metres) 12. of the point of intersection of lines joining the top of each pole to the foot of the other, from this horizontal plane is: (b) 18 (c) 12 (d) 16 (a) 15 The value of  $3 + \frac{1}{4 + \frac{1}{3 + \frac{1}{4 + \frac{1}{3 + \frac{$ 13. (b)  $2 + \sqrt{3}$ (c)  $3+2\sqrt{3}$  (d)  $4+\sqrt{3}$ (a)  $1.5 + \sqrt{3}$ If  $\alpha \neq \beta$  but  $\alpha^2 = 5\alpha - 3$  and  $\beta^2 = 5\beta - 3$  then the equation having  $\frac{\alpha}{\beta}$  and  $\frac{\beta}{\alpha}$  as its roots is: 14.

(a) 
$$3x^2 + 19x + 3 = 0$$
 (b)  $3x^2 + 19x - 3 = 0$  (c)  $3x^2 - 19x + 3 = 0$  (d)  $x^2 - 5x + 3 = 0$ 

- **15.** Different A.P's are constructed with the first term 100, the last term 199, and integral common differences. Then the sum of the common differences of all such, A.P's having at least 3 terms and at most 33 terms is:
  - (a) 83 (b) 43 (c) 63 (d) 53

### CHEMISTRY

Α

- 16. Which of the following compounds is used in the preparation of borax?
  - (a) Baking Soda (b) Caustic Soda (c) Bleaching Powder (d) Washing Soda
- **17.** Some common examples of colloids are given in the table below. Choose the incorrect option among the following:

	Dispersed phase	Dispersing medium	Туре	Example
(a)	Liquid	Gas	Aerosol	Smoke
(b)	Gas	Liquid	Foam	Shaving Cream
(c)	Liquid	Liquid	Emulsion	Milk
(d)	Solid	Liquid	Sol	Milk of Magnesia

- 18. Considering the following statements. Which of the following sets of statements is correct?
  - (I) Only magnesium and manganese react with concentrated nitric acid to give hydrogen gas.
  - (II) In Chlor-alkali process hydrogen gas is given off at the cathode and chlorine gas at the anode along with sodium hydroxide solution formed near anode.
  - (III) 15-18% solution of acetic acid in water is also called as vinegar.
  - (IV) Tincture of iodine is a solution of Iodine in ethanal.
  - (V) Cinnabar is a carbonate ore of Zinc.
  - (a) I, III, IV, V (b) I, II, III, V (c) I, II, IV (d) All are incorrect



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**A**]

**19.** In the table given below some alloys are given along with their composition. Choose the correct response from the given codes:

	Alloy		Composition
Р	Brass	(i)	Cu and Sn
Q	Bronze	(ii)	Pb and Sn
R	Solder	(iii)	Fe and C
S	Steel	(iv)	Fe, Ni and Cr
		(v)	Cu and Zn

(a) P-(i); Q-(v); R-(ii); S-(iv)

(b) P-(v); Q-(i); R-(iv); S-(iii)

(c) P-(i); Q-(v); R-(iv); S-(iii)

- (d) P-(v); Q-(i); R-(ii); S-(iii)
- **20.** When 1 gram of a mixture of magnesium and aluminium metals was treated with HCl, a gas was liberated. At the end of the reaction, the volume of the liberated gas was found to be 1120ml, under STP conditions. The individual weights of magnesium and aluminium metal in the mixture, respectively, are
  - (a) 0.2g and 0.8g (b) 0.1g and 0.9g
  - (c) 0.4g and 0.6g (d) 0.3g and 0.7g
- 21. Which one of the following statements in not true regarding micelle?
  - (a) The micelles stay in solution as colloid.
  - (b) Micelle will not come together to precipitate.
  - (c) There is ion-ion repulsion between micelles.
  - (d) The dirt suspended in the micelles is very difficult to get rinsed off
- 22. How many structural isomers are possible for bromohexane?
  - (a) 9 (b) 12 (c) 15 (d) 17
- **23.** In a gaseous mixture of carbon monoxide (CO), methane (CH<sub>4</sub>) and propane (C<sub>3</sub>H<sub>8</sub>), the % by volume of methane is 20 and remaining carbon monoxide and propane are present in the ratio of 3 : 5 by volume. When 200 ml of the mixture is burnt in excess of oxygen. The volume of carbon dioxide produced is:
  - (a) 416 ml (b) 392 ml (c) 380 ml (d) 400 ml
- 24. Atomic radii of Be, O, C, N, B are respectively (in pm):
  - (a) 111, 66, 77, 74, 88 (b) 74, 84, 111, 77, 66
    - (c) 111, 88, 77, 74, 66 (d) 111, 66, 88, 77, 74
- **25.** The IUPAC name of the given compound is?

$$CH_{3}$$

$$CI - CH_{2} - CH_{2} - CH_{3}$$

$$CH_{3} - CH - CH_{2} - CH - CH_{2} - CH_{3}$$

$$H_{3} - CH - CH_{2} - CH_{3} - CH_{3}$$

$$H_{3} - CH_{3} - CH_{3}$$

$$CH_{3} - CH_{3} - CH_{3}$$

- (a) 6-Chloro-5,6-diethyl-3-methylheptan-4-ol
- (b) 2-Chloro-2,3-diethyl-5-methylheptan-4-ol
- (c) 3,6-Dimethyl-3-chloro-5-ethyloctan-5-ol
- (d) 6-Chloro-5-ethyl-3,6-dimethyloctan-4-ol



# PHYSICS

(a) 5 A

26. What will be the value of the current flowing through the  $6\Omega$  resistor in the given circuit?



27. A uniform conducting wire of resistance  $20 \Omega$  is cut into four equal parts by its length and all these parts are connected in parallel. Then equivalent resistance of that parallel combination will be:

(a) 
$$5 \Omega$$
 (b)  $4 \Omega$  (c)  $\frac{4}{5} \Omega$  (d)  $\frac{5}{4} \Omega$ 

**28.** A person moves from point A to point B with speed 6 m/s and returns to initial point A with speed 3 m/s following the same path. Average speed of the person for the round trip is:

- (a) 4 m/s (b) 2 m/s (c) 4.5 m/s (d) 9 m/s
- **29.** Consider the universal law of gravitation for two particles of mass  $m_1$  and  $m_2$  with separation between them as r.

With the variation of mass  $m_1$  as given in column (1) and variation of mass  $m_2$  as given in column (2) and variation in separation r between them given in column (3), match the variation in force F acting between them given in column (4).

	Column-1 Column-2		Column-3	Column-4
	$m_{i}$	$m_2$	r	F
(i)	gets doubled	remain same	gets doubled	remain same
(ii)	gets doubled	gets doubled	gets doubled	remain same
(iii)	gets quadrupled	remain same	gets doubled	remain same
(iv)	remain same	gets quadrupled	gets doubled	remain same

Select the correct option given

(a) (i) and (ii) are correct

(b) (ii), (iii) and (iv) are correct

(c) (i), (ii) and (iv) are correct

- (d) (i) and (iii) are correct
- **30.** If light rays coming from the sun converge at a distance of 20 cm from a concave mirror then find the image distance after reflection formed by the mirror for an object placed at 30 cm from the pole of the mirror.
  - (a) 20 cm (b) 60 cm (c) 40 cm (d) 10 cm

(b) 60 cm

**31.** To get the real and 3 times magnified image by a concave mirror of focal length 15 cm, the object distance should be:

(c) 45 cm

- (a) 20 cm
- 32. A light ray takes time T<sub>1</sub> to cover a distance of  $\ell$  in water (refractive index of water  $=\frac{4}{3}$ ) and takes

time  $T_2$  to cover a distance of  $\frac{3\ell}{2}$  in glass slab (refractive index of glass  $=\frac{3}{2}$ ). Then  $\frac{T_1}{T_2}$  will be: (a)  $\frac{27}{16}$  (b)  $\frac{16}{27}$  (c)  $\frac{8}{9}$  (d)  $\frac{9}{8}$ 



(d) 5 cm

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**33.** Consider the given statements:

Α

- (A) Convex mirror is converging when in air
- (B) Concave mirror is converging when in air
- (C) Convex lens is diverging when in air
- (D) Concave lens is diverging when in air
- Which of the statement given above are NOT CORRECT?

(a) A and C (b) A and D

(c) B and D

(d) B and C

34. A light bulb (100W, 50V) is connected in series with a resistor of  $15\Omega$  as shown in diagram.



What should be the voltage of the connected battery so that bulb glows with maximum brightness? (a) 50 V (b) 100 V (c) 30 V (d) 80 V

**35.** What will be the reading in the ideal ammeter in the given circuit?



# BIOLOGY

**36.** Which of the following is a dioecious organism?



- 37. Read the following statements and select the correct option:
  Statement 1: In gymnosperms, endosperm is formed before fertilization and is haploid.
  Statement 2: In angiosperms, endosperm is formed after fertilization and is diploid.
  Statement 3: In gymnosperms, endosperm is formed after fertilization and is diploid.
  Statement 4: In angiosperms, endosperm is formed before fertilization and is triploid.
  (a) Only statement (2) is correct
  (b) Only statement (3) is correct
  (c) Only statement (1) is correct
  (d) Bath statements (2) and (4) are a
  - (c) Only statement (1) is correct (d) Both statements (3) and (4) are correct



- **38.** The organelles that are included in the endomembrane system are:
  - (a) Golgi complex, mitochondria, ribosome and lysosome
  - (b) Golgi complex, endoplasmic reticulum, mitochondria and lysosome
  - (c) Endoplasmic reticulum, mitochondria, ribosome and lysosome
  - (d) Endoplasmic reticulum, Golgi complex, lysosome and vacuole
- **39.** Which of the following is an incorrect statement?
  - (a) The perinuclear space forms a barrier between the materials present inside the nucleus and that of the cytoplasm.
  - (b) Nuclear pore acts as a passage for proteins and the RNA molecules in both the directions between nucleus and cytoplasm.
  - (c) Mature sieve tube elements possess a conspicuous nucleus and all cytoplasmic organelles.
  - (d) Microbodies are present both in plant and animal cells.
- 40. Match the items in column-I with those in column-II and select the correct option given below:

	Column-I (Function)		Column-II (Parts of Excretory System)
(1)	Ultrafiltration	(i)	Henle's Loop
(2)	Concentration of urine	(ii)	Ureter
(3)	Transport of urine	(iii)	Urinary Bladder
(4)	Storage of urine	(iv)	Malpighian Corpuscle
		(v)	Proximal Convoluted Tubule

	1	2	3	4
(a)	v	iv	i	ii
(b)	iv	i	ii	iii
(c)	iv	v	ii	iii
(d)	v	iv	i	iii

41. Match the items in Column-I with those in Column-II and select the correct option given below:

	Column-I		Column-II
(1)	Pituitary gland	(i)	Grave's Disease
(2)	Thyroid gland	(ii)	Diabetes Mellitus
(3)	Adrenal gland	(iii)	Diabetes Insipidus
(4)	Pancreas	(iv)	Addison's Disease

	1	2	3	4
(a)	iv	iii	i	ii
(b)	iii	iv	i	ii
(c)	iii	i	iv	ii
(d)	ii	i	iv	iii



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**42.** Column-I contains name of the sphincter muscles of the alimentary canal and column-II contains their locations. Match them properly and choose the correct answer.

	Column-I		Column-II
(1)	Cardiac sphincter	(i)	Between duodenum and posterior stomach
(2)	Sphincter of oddi	(ii)	Between small intestine and large intestine
(3)	Ileocaecal sphincter	(iii)	Between oesophagus and anterior stomach
(4)	Pyloric sphincter	(iv)	Opening of hepatopancreatic duct into duodenum

	1	2	3	4
(a)	iii	ii	iv	i
(b)	i	ii	iv	iii
(c)	i	iv	ii	iii
(d)	iii	iv	ii	i

- **43.** Mother and father of a person with 'O' blood group have 'A' and 'B' blood group respectively. What would be the genotype of both mother and father?
  - (a) Mother is homozygous for 'A' blood group and father is heterozygous for 'B'.
  - (b) Mother is heterozygous for 'A' blood group and father is homozygous for 'B'.
  - (c) Both mother and father are heterozygous for 'A' and 'B' blood groups.
  - (d) Both mother and father are homozygous for 'A' and 'B' blood groups.
- 44. Which pathway is correct for blood clotting?
  - (a) Thromboplastin or Thrombokinase (from injured platelets/tissues)



(b) Thromboplastin or Thrombokinase (from injured platelets/tissues)

Thrombin 
$$\longrightarrow$$
 Prothrombin  
 $\downarrow$  Ca<sup>+2</sup>  
Fibrin  $\longrightarrow$  Fibrinogen  
 $\downarrow$  + dead and damaged  
formed elements  
Clot



Α

(c) Thromboplastin or Thrombokinase (from injured platelets/tissues) Fibrinogen  $\longrightarrow$  Fibrin Thrombin  $\leftarrow$  Ca<sup>+2</sup> Prothrombin

Α

- ♦ Thrombin + dead and damaged + dead and damaged formed elements
- (d) Thromboplastin or Thrombokinase (from injured platelets/tissues) Prothrombin  $\xrightarrow{Ca^{+2}}$  Thrombin Fibrinogen  $\xrightarrow{Fibrin}$ Clot  $\leftarrow$  Fibrin + dead and damaged

formed elements

**45.** The following is a simplified scheme showing the fate of glucose during aerobic and anaerobic respiration. Identify the end products that are formed at stages indicated as A, B, C and D. Identify the correct option from those given below:



	1	2	3	4	5	6	7
(a)	Pyruvic acid (3C) (2 molecules)	Kreb's cycle	$\frac{\text{CO}_2}{^{(3\text{molecules})}} + \text{H}_2\text{O} + \\ \text{energy}$	Absence of oxygen	$\begin{array}{c} Ethanol + \\ CO_2 + \\ energy \end{array}$	Lack of oxygen	Lactic acid (3C) + energy
(b)	Pyruvic acid (3C) (2 molecules)	Kreb's cycle	$\frac{\text{CO}_2}{(2 \text{ molecules})} + \text{H}_2\text{O} + \\ \text{energy}$	Absence of oxygen	$\begin{array}{c} Ethanol + \\ CO_2 + \\ energy \end{array}$	Lack of oxygen	$\begin{array}{c} \text{Lactic acid} \\ {}_{(3C)} \\ + \text{ energy } + \\ \text{CO}_2 \end{array}$



A

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(c)	Pyruvic acid (3C) (2 molecules)	Kreb's cycle	$\frac{\text{CO}_2}{(2 \text{ molecules})} + \text{H}_2\text{O} + \\ \text{energy}$	Absence of oxygen	$\begin{array}{c} Ethanol + \\ CO_2 + \\ energy \end{array}$	Lack of oxygen	Lactic acid (3C) + energy
(d)	Pyruvic acid (3C) (2 molecules)	Kreb's cycle	$\frac{\text{CO}_2}{(3 \text{ molecules})} + \text{H}_2\text{O} + \\ \text{energy}$	Absence of oxygen	$\begin{array}{c} Ethanol + \\ CO_2 + \\ energy \end{array}$	Lack of oxygen	Lactic acid (3C) + energy

46. Of the total amount of energy that passes from one trophic level to another, about 10% is:

(a) respired and becomes heat

(b) passed out as faeces or urine

(c) stored in body tissue

(d) recycled to autotrophs

**47.** A person has problems with calcium and phosphorus metabolism in his body. Which one of the following glands may not be functioning properly?

- (a) Adrenal (b) Parathyroid (c) Parotid (d) Pancreas
- **48.** Which of the following statements are correct?
  - (i) Somatic nervous system-Conducts impulses from CNS to skeletal muscles and vice versa.
  - (ii) Autonomic nervous system-Conduct impulses from CNS to involuntary organ and smooth muscles.
  - (iii) Central nervous system-Consists of brain and spinal cord.
  - (iv) Peripheral nervous system-Consists of nerves carrying impulses to brain and spinal cord only.
  - (a) Only (ii) and (iii) (b) Only (iii) and (iv) (c) Only (i), (ii) and (iii) (d) All of these
- **49.** Read the flow chart carefully and identify (1), (2), (3), (4) and (5).



I am a type of '(2)'. I am found between the skin and muscles, around blood vessels and nerves and in the bone marrow. I fill the space inside the organs, support internal organs and help in repair of tissues. My name is (5).

	1	2	3	4	5
(a)	Epithelial tissue	Cuboidal Epithelium	Osteoblast	Water canal	Columnar Epithelium
(b)	Connective tissue	Bone	Canaliculus	Haversian Canal	Areolar tissue
(c)	Connective tissue	Bone	Haversian Canal	Canaliculus	Adipose tissue
(d)	Connective tissue	Bone	Osteoblast	Haversian Canal	Areolar tissue



- **50.** Geitonogamy refers to :
  - (a) It is the transfer of pollen grains from the anther of a flower to the stigma of the same flower of the same plant.
  - (b) It is the transfer of pollen grains from the anther of a flower to the stigma of different flower of the same plant.
  - (c) It is the transfer of pollen grains from the anther of a flower to the stigma of different flower of different plant.
  - (d) It is the transfer of pollen grains from the anther of a flower to the anther of the another flower of the same plant.

\* \* \* \* \*



# **DETAIL SOLUTION OF SET-A**

# MATHEMATICS

**1.** (b)

A

 $\frac{x^2 - x + 1}{x^2 + x + 1} = \frac{2}{3}$ 

Divided by x in numerator and denominator, we have

$$\frac{x-1+\frac{1}{x}}{x+1+\frac{1}{x}} = \frac{2}{3}$$

$$\Rightarrow \frac{\left(x+\frac{1}{x}\right)-1}{x+\frac{1}{x}+1} = \frac{2}{3}$$

$$\Rightarrow 3\left(x+\frac{1}{x}\right)-3 = 2\left(x+\frac{1}{x}\right)+2$$

$$\Rightarrow \left(x+\frac{1}{x}\right)=5$$

$$p^{4} + q^{4} + p^{2}q^{2} = 273$$

$$\Rightarrow (p^{2})^{2} + (q^{2})^{2} + 2p^{2}q^{2} - p^{2}q^{2} = 273$$

$$\Rightarrow (p^{2} + q^{2})^{2} - (pq)^{2} = 273$$

$$\Rightarrow (p^{2} + q^{2} + pq)(p^{2} + q^{2} - pq) = 273$$

$$\Rightarrow (p^{2} + q^{2} + pq) \times 21 = 273$$

$$p^{2} + q^{2} + pq = 13 \qquad \dots(i)$$

$$p^{2} + q^{2} - pq = 21 \qquad \dots(ii) \qquad (given)$$

Adding equation (i) and (ii), we get

 $2(p^{2} + q^{2}) = 34$   $p^{2} + q^{2} = 17$  pq = -4 (from equation (i))  $(p+q)^{2} = p^{2} + q^{2} + 2pq$   $\Rightarrow (p+q)^{2} = 17 + 2(-4)$   $\Rightarrow (p+q)^{2} = 17 - 8$ 



$$\Rightarrow (p+q)^2 = 9$$

 $\implies p+q=\pm 3$ 

Dividing by pq on both side, we get

$$\Rightarrow \frac{p+q}{pq} = \frac{\pm 3}{(pq)}$$
$$= \pm \frac{3}{(-4)}$$
[put pq = -4 from equation (i)]
$$= \pm \frac{3}{4}$$

Hence one of the values =  $-\frac{3}{4}$ 

#### **3.** (a)

Let a be first term and d be common difference of AP

Given 
$$S_{3n} = 3S_{2n}$$
  
 $\frac{3n}{2} [2a + (3n - 1)d] = 3\frac{2n}{2} [2a + (2n - 1)d]$   
 $2a + (3n - 1)d = 2[2a + (2n - 1)d]$   
 $\Rightarrow 2a + (3n - 1)d = 4a + 2(2n - 1)d$   
 $\Rightarrow 2a + (3n - 1)d = 4a + 4nd - 2d$   
 $\Rightarrow 2a + 3nd - d = 4a + 4nd - 2d$   
 $\Rightarrow 2a + 4nd - 2d - 3nd + d = 0$   
 $\Rightarrow 2a + nd - d = 0$   
 $\Rightarrow 2a + (n - 1)d = 0$   
 $\frac{S_{4n}}{S_{2n}} = \frac{\frac{4n}{2} [2a + (4n - 1)d]}{\frac{2n}{2} [2a + (2n - 1)d]}$   
 $= \frac{2[2a + (n - 1)d + 3nd]}{[2a + (n - 1)d + nd]}$   
 $= \frac{2[3nd]}{nd}$  {:  $2a + (n - 1)d = 0$ }  
 $= 2 \times 3 = 6$   
(c)  
Given :  $\angle BAC = \theta$   
 $\angle ABC = 90^{\circ}$ 

In  $\triangle ABC$ 



4.

 $\angle ABC + \angle BCA + \angle BAC = 180^{\circ}$  $\angle BCA = 180^{\circ} - 90^{\circ} - \theta$  $\Rightarrow$  $\angle BCA = 90^{\circ} - \theta$ ...(i)  $\angle ARB = 90^{\circ}$ (angle in semi circle)  $\angle ABR = 90^{\circ} - \theta$  $\angle \text{RBP} = 90^\circ - (90^\circ - \theta) = \theta$ BP = PR...(ii) (length of tangents drawn from P to the circle are equal)  $\therefore \ \angle PRB = \angle RBP = \theta$  $\angle ARB + \angle BRC = 180^{\circ}$ (Linear pair)  $\therefore \angle BRC = 90^{\circ}$  $\Rightarrow \angle PRC + \angle PRB = 90^{\circ}$  $\angle PRC = 90^{\circ} - \theta$  $\Rightarrow$  $\angle BCA = \angle PCR = 90^{\circ} - \theta$ (from equation (i)) In  $\triangle PRC$ PR = PC... (iii) from (ii) and (iii) BP = PR = PCPC = 13 $\Rightarrow$ (d) Let the monthly income of Vijay and Rakesh be 3x, 4x and monthly expenditures be 5y, 7y Savings of Vijay = 3x - 5ySavings of Rakesh = 4x - 7yGiven,  $\frac{3x-5y}{4x-7y} = \frac{3}{2}$ 6x - 10y = 12x - 21y6x - 11y = 0...(i)

and

5.

 $\Rightarrow -x + 2y = 500 \qquad \dots (ii)$ 

Solve equation (i) and (ii), we get

x = 5500, y = 3000

3x - 5y = 4x - 7y + 500

:. Monthly income of Rakesh =  $4x = 4 \times 5500$ 

=₹22000

**6.** (a)





Area of square formed by joining the centre of all outer circles =  $(20)^2$ = 400

The required area = Area of the square -  $16\left(\frac{1}{4} \times \text{Area of circle}\right)$ 

$$= 400 - 16 \left( \frac{\pi (5)^2}{4} \right)$$
$$= 400 - \frac{16 \times 25}{4} \pi$$

$$= (400 - 100 \pi) \text{ cm}^2$$

**7.** (b)

 $4x - y - 8 = 0 \qquad \qquad \dots (i)$ 

2x + y - 10 = 0 ...(ii)

Solving equation (i) and (ii), we get

x = 3, y = 4

4x - y - 8 = 0 and y = 0

intersect at (2, 0)

2x + y - 10 = 0 and y = 0

intersect at (5, 0)





**8.** (c)



14

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Total number of days in leap year is 366 days.

Hence number of weeks in a leap year is  $\frac{366}{7} = 52$  weeks and 2 days

In a leap year we have 52 complete weeks and 2 days which can be any pair of the day of the week i.e. (SUN, MON), (MON, TUE), (TUE, WED), (WED, THU), (THU, FRI), (FRI, SAT), (SAT, SUN) to make 52 Mondays the additional days should not include Monday.

Hence Probability =  $\frac{5}{7}$ 

**9.** (c)

L.C.M (45, 60) = 180 seconds

= 3 minutes

Therefore they will toll together in every 3 minutes.

Hence, option (c) is correct.

**10.** (c)

$$(\sin^{2} x + \cos^{2} x)^{2} = \sin^{4} x + \cos^{4} x + 2\sin^{2} x \cos^{2} x$$
  

$$\Rightarrow \sin^{4} x + \cos^{4} x = 1 - 2\sin^{2} x \cos^{2} x$$
  

$$(\sin^{2} x + \cos^{2} x)^{3} = \sin^{6} x + \cos^{6} x + 3\sin^{2} x \cos^{2} x (\sin^{2} x + \cos^{2} x))$$
  

$$\Rightarrow \sin^{6} x + \cos^{6} x = 1 - 3\sin^{2} x \cos^{2} x$$
  

$$f_{6}(x) - f_{4}(x)$$
  

$$= \frac{1}{6} (\sin^{6} x + \cos^{6} x) - \frac{1}{4} (\sin^{4} x + \cos^{4} x)$$
  

$$= \frac{1}{6} (1 - 3\sin^{2} x \cos^{2} x) - \frac{1}{4} (1 - 2\sin^{2} x \cdot \cos^{2} x)$$
  

$$= \frac{1}{6} - \frac{1}{2} \sin^{2} x \cos^{2} x - \frac{1}{4} + \frac{1}{2} \sin^{2} x \cdot \cos^{2} x$$
  

$$= \frac{1}{6} - \frac{1}{4}$$
  

$$= \frac{2 - 3}{12}$$
  

$$= -\frac{1}{12}$$

**11.** (d)

 $15\sin^{4}\theta + 10\cos^{4}\theta = 6 \times 1$   $15\sin^{4}\theta + 10\cos^{4}\theta = 6\left(\sin^{2}\theta + \cos^{2}\theta\right)^{2}$  $\Rightarrow 15\sin^{4}\theta + 10\cos^{4}\theta = 6\left(\sin^{4}\theta + \cos^{4}\theta + 2\sin^{2}\theta \cdot \cos^{2}\theta\right)$ 



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$$\Rightarrow 9\sin^4 \theta + 4\cos^4 \theta - 12\sin^2 \theta \cos^2 \theta = 0$$
  

$$\Rightarrow (3\sin^2 \theta - 2\cos^2 \theta)^2 = 0$$
  

$$\Rightarrow 3\sin^2 \theta = 2\cos^2 \theta$$
  

$$\tan^2 \theta = \frac{2}{3}$$
  

$$\cot^2 \theta = \frac{3}{2}$$
  

$$27 \sec^6 \theta + 8 \csc^6 \theta$$
  

$$= 27 (\sec^2 \theta)^3 + 8 (\csc^2 \theta)^3$$
  

$$= 27 (1 + \tan^2 \theta)^3 + 8 (1 + \cot^2 \theta)^3$$
  

$$= 27 \left(1 + \frac{2}{3}\right)^3 + 8 \left(1 + \frac{3}{2}\right)^3$$
  

$$= 27 \left(\frac{5}{3}\right)^3 + 8 \left(\frac{5}{2}\right)^3$$
  

$$= \frac{27 \times 125}{27} + \frac{8 \times 125}{8}$$
  

$$= 125 + 125$$
  

$$= 250$$

**12.** (a)



 $\frac{EF}{AB} = \frac{FC}{BC}$   $\frac{H}{20} = \frac{b}{a+b} \qquad \dots (i)$   $\Delta EBF \sim \Delta DBC \qquad (by AA)$   $\frac{EF}{DC} = \frac{BF}{BC}$ 



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$$\Rightarrow \frac{H}{60} = \frac{a}{a+b} \qquad \dots (ii)$$

Adding equation (i) and (ii), we get

$$\frac{H}{20} + \frac{H}{60} = \frac{b}{a+b} + \frac{a}{a+b}$$
$$\Rightarrow \frac{3H+H}{60} = \frac{a+b}{a+b}$$
$$\Rightarrow 4H = 60$$
$$\Rightarrow H = 15$$

Let 
$$x = 3 + \frac{1}{4 + \frac{1}{3 + \frac{1}{4 + \frac{1}{3 + \dots,\infty}}}}$$
  
So  $x = 3 + \frac{1}{4 + \frac{1}{x}}$   
 $\Rightarrow x = 3 + \frac{1}{\frac{4x + 1}{x}}$   
 $\Rightarrow x = 3 + \frac{x}{4x + 1}$   
 $\Rightarrow x = \frac{12x + 3 + x}{4x + 1}$   
 $\Rightarrow 4x^2 + x = 13x + 3$   
 $\Rightarrow 4x^2 - 12x - 3 = 0$   
 $\Rightarrow x = \frac{12 \pm \sqrt{(12)^2 + 4 \times 4 \times 3}}{2 \times 4}$   
 $\Rightarrow x = \frac{12 \pm \sqrt{(12)^2 + 4 \times 12}}{8}$   
 $\Rightarrow x = \frac{12 \pm \sqrt{12(12 + 4)}}{8}$   
 $\Rightarrow x = \frac{12 \pm \sqrt{12(12 + 4)}}{8}$   
 $\Rightarrow x = \frac{12 \pm \sqrt{12(12 + 4)}}{8}$ 



$$\Rightarrow x = \frac{3 \pm \sqrt{12}}{2}$$
$$\Rightarrow x = \frac{3 \pm 2\sqrt{3}}{2}$$
$$\Rightarrow x = \frac{3 \pm 2\sqrt{3}}{2}$$
$$\Rightarrow x = \frac{3}{2} \pm \sqrt{3}$$
$$\Rightarrow x = 1.5 \pm \sqrt{3}$$

But only positive value is accepted

So, 
$$x = 1.5 + \sqrt{3}$$

**14.** (c)

Given that  $\alpha^2 = 5\alpha - 3$  and  $\beta^2 = 5\beta - 3$ 

 $\Rightarrow \alpha$  and  $\beta$  are roots of equation  $x^2 = 5x - 3$ 

$$x^2 - 5x + 3 = 0$$

 $\therefore \alpha + \beta = 5$ 

$$\alpha\beta = 3$$

Thus the equation whose roots are  $\frac{\alpha}{\beta}$  and  $\frac{\beta}{\alpha}$  is

$$x^{2} - x\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right) + \frac{\alpha}{\beta} \times \frac{\beta}{\alpha} = 0$$

$$x^{2} - x\left(\frac{\alpha^{2} + \beta^{2}}{\alpha\beta}\right) + 1 = 0$$

$$x^{2} - x\left(\frac{(\alpha + \beta)^{2} - 2\alpha\beta}{\alpha\beta}\right) + 1 = 0$$

$$x^{2} - x\left(\frac{25 - 2 \times 3}{3}\right) + 1 = 0$$

$$\Rightarrow x^{2} - x\left(\frac{19}{3}\right) + 1 = 0$$

$$\Rightarrow 3x^{2} - 19x + 3 = 0$$

**15.** (d)

Let first term, common difference and number of terms of the AP be a, d and n respectively.

$$a_n = a + (n - 1)d$$

$$199 = 100 + (n - 1)d$$

$$\Rightarrow d = \frac{99}{n - 1}$$

Now checking for what value of n we have integral common difference,



For	n = 4,	$d = \frac{99}{3} = 33$	(which is integer)
For	n = 10,	$d = \frac{99}{9} = 11$	(which is integer)
For	n = 12,	$d = \frac{99}{11} = 9$	(which is integer)

So, sum of all common difference that are integer will be

= 33 + 11 + 9= 53

### CHEMISTRY

16. (d) Washing Soda

#### **Explanation**:

Washing Soda is used in the manufacture of sodium compounds such as borax.

	(Class-10 <sup>th</sup> NCERT Page no. 32)
<b>17.</b> (a)	(Class-9 <sup>th</sup> NCERT Page no. 18)

18. (d)

#### **Explanation**:

Only magnesium and manganese react with very dilute Nitric acid to evolve H<sub>2</sub> gas. (I)

		(Class-10 <sup>th</sup> NCERT Page no. 44)
(II)	In chlor-alkali process hydrogen gas is given off at the cathode	and chlorine gas at the anode
	along with sodium hydroxide solution formed near cathode.	(Class-10 <sup>th</sup> NCERT Page no. 30)
(III)	5-8% solution of acetic acid in water is also called as Vinegar.	(Class-10 <sup>th</sup> NCERT Page no. 73)
(IV)	Tincture of iodine is a solution of <i>iodine in ethanol</i> .	(Class-10 <sup>th</sup> NCERT Page no. 72)
(V)	Cinnabar is a sulphide ore of mercury (HgS).	(Class-10 <sup>th</sup> NCERT Page no. 51)

- (V) Cinnabar is a sulphide ore of mercury (HgS).
- 19. (d)

### **Explanation:**

- Brass: It is an alloy of copper and zinc (Cu and Zn)
- Bronze: It is an alloy of copper and Tin (Cu and Sn)
- It is an alloy of lead and tin (Pb and Sn) Solder:
- It is an alloy of Iron and small amount of carbon (0.05%)Steel:

(Class-10<sup>th</sup> NCERT Page no. 54) {*Mole Concept Based*}

20. (c)

Let mass of magnesium metal in mixture is xg.

 $\therefore$  mass of aluminium metal in mixture will be (1 - x)g

When magnesium and aluminium is treated with HCl following reaction will take place:-

 $\texttt{ Mg(s)} + 2\text{HCl(aq)} \longrightarrow \text{MgCl}_2 + \text{H}_2$ 

 $\left(\frac{x}{24}\right)$  mole

1 mole of mg given 1 mole of  $H_2$  gas.

$$\therefore \frac{x}{24}$$
 mole will give  $\frac{x}{24}$  mole H<sub>2</sub>.

\* 2 Al(s) + 6 HCl(aq) 
$$\longrightarrow$$
 2AlCl<sub>3</sub> + 3H<sub>2</sub>



$$\left(\frac{1-x}{27}\right)$$
 mole

2 mole of Al gives 3 mole of  $H_2$  gas.

$$\therefore \quad \left(\frac{1-x}{27}\right) \text{ mole will give } \frac{3}{2} \times \left(\frac{1-x}{27}\right) \text{ mole } H_2.$$

According to question-

1120 ml of  $H_2$  gas liberated at S.T.P condition.

$$\therefore \text{ moles of } H_2 \text{ gas} = \frac{\text{Given Volume}}{\text{Molar Volume}}$$

$$\therefore \text{ moles of } H_2 \text{ gas} = \frac{1120}{22400}$$

$$=\frac{1}{20}$$
 mole

According to question:

$$\frac{x}{24} + \frac{3}{2}\frac{(1-x)}{27} = \frac{1}{20}$$

$$\Rightarrow \frac{x}{24} + \frac{(1-x)}{18} = \frac{1}{20}$$

$$\Rightarrow \frac{3x+4-4x}{72} = \frac{1}{20}$$

$$\Rightarrow \frac{(4-x)}{72} = \frac{1}{20}$$

$$\Rightarrow 4-x = \frac{72}{20}$$

$$\Rightarrow x = 4 - \frac{72}{20}$$

$$\Rightarrow x = \frac{80-72}{20}$$

$$\Rightarrow x = \frac{80-72}{20}$$

$$\Rightarrow x = 0.4 \text{ gram}$$

$$\therefore \text{ mass of mg} = 0.4 \text{ g,}$$
(d)
(d)
for Bromohexane 17 structures

ructural isomers will be possible.

~---

~ . .

mass of Al = 0.6 g

1. 
$$CH_{3} - CH_{2} - CH_{2} - CH_{2} - CH_{2} - CH_{2} - CH_{2} - Br$$
  
2.  $CH_{3} - CH_{2} - CH_{2} - CH_{2} - CH_{3} - CH_{3}$   
3.  $CH_{3} - CH_{2} - CH_{2} - CH_{2} - CH_{3}$   
Br  
4.  $CH_{3} - CH_{3} - CH_{2} - CH_{2} - CH_{2} - Br$   
 $CH_{3} - CH_{3} - CH_{3}$ 

{AT STP 1 mole of any gas occupies 22400 mL)

(Class-10<sup>th</sup> NCERT Page no. 75)



21. 22.

A

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**A** 6.  $CH_3 - CH - CH - CH_2 - CH_3$  $CH_3 Br$ Br 7.  $CH_3 = CH_2 = CH_2 = CH_3$ CH. 8.  $CH_3 - CH - CH_2 - CH_2 - CH_3$ CH<sub>2</sub>—Br 9.  $CH_3 - CH_2 - CH - CH_2 - CH_2 - Br$  $CH_3$ 10.  $CH_3 - CH_2 - CH - CH_3 - CH_3$  $CH_3 Br$ Br 11.  $\operatorname{CH}_3 - \operatorname{CH}_2 - \overset{|}{\underset{c}{\operatorname{CH}}} - \operatorname{CH}_2 - \operatorname{CH}_3$ 12.  $CH_3 - CH_2 - C - CH_2 - CH_3$  $\downarrow$  $CH_2 - Br$ 13.  $CH_3 = CH_3 = CH_2 = CH_2 = Br$ CH<sub>3</sub> 14.  $CH_3 \xrightarrow[]{} CH_3$   $C \xrightarrow[]{} CH_3 CH_3$   $CH_3 Br$ CH<sub>3</sub> 15. Br - CH<sub>2</sub> -  $\overset{|}{C}$  - CH<sub>2</sub> - CH<sub>3</sub> CH<sub>3</sub> 16.  $CH_3 - CH - CH - CH_2 - Br$  $| H_3 - CH_3 - CH_3$ 17.  $CH_3 - CH_1 - CH_3$ CH<sub>2</sub> CH<sub>2</sub>

**23.** (d)

#### Explanation:

200 ml of the mixture of CO,  $CH_4$  and  $C_3H_8$  is given-% by volume of  $CH_4$  is 20 {Based on burning of carbon compound}



(Class-10<sup>th</sup> NCERT Page no. 88, Activity 5.7)

 $\Rightarrow$  Volume of CH<sub>4</sub> =  $\frac{20}{100} \times 200$  ml

Volume of  $CH_4 = 40 \text{ ml}$ 

- $\Rightarrow$  Volume of remaining mixture = (200 40) = 160 ml
- and remaining CO and  $C_3H_8$  are present in ratio of 3 : 5 by volume
- $\therefore$  Volume of CO = 60 ml

and Volume of  $C_3H_8 = 100 \text{ ml}$ 

when these gases are burnt in exess of oxygen following reactions will take place.

$$CO + \frac{1}{2}O_2 \longrightarrow CO_2$$

 $60\ ml$  of CO gives  $60\ ml$  of CO\_2

 $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$ 

40 ml of CH<sub>4</sub> gives 40 ml of CO<sub>2</sub>

 $C_3H_8 + 5O_2 \longrightarrow 3CO_2 + 4H_2O$ 

100 ml of  $C_3H_8$  gives  $3 \times 100$  ml of  $CO_2$ 

 $\therefore \text{ Total volume of CO}_2 \text{ produced}$  $= (60 + 40 + 3 \times 100)$ = 400 ml

**24.** (a)

**25.** (d)

Explanation:

$$CH_{3} = CH_{2} = CH_{2} = CH_{2} = CH_{3} = CH_{2} = CH_{2} = CH_{3} = CH_{2} = CH_{2} = CH_{2} = CH_{2} = CH_{3} = CH_{2} = CH_{3} = CH_{2} = CH_{3} = C$$

In the above compound numbering will be done as shown because (— OH) will get the lowest possible number as it is a functional group (Alcohol)

At carbon number 5 ethyl group is present

At carbon number 3 and 6 methyl group is present

At carbon number 6 - Chloro group is present

 $\therefore$  IUPAC name of the above compound is 6 – Chloro – 5 – ethyl – 3, 6 – dimethyloctan – 4 – ol.

## PHYSICS

**26.** (c)

 $3~\Omega$  and  $6~\Omega$  are in parallel

$$\therefore \text{ their equivalent is } \frac{3 \times 6}{3 + 6} = 2 \Omega$$
  
And  $R_{eq} = 8 \Omega$   
$$\therefore \quad i_{total} = \frac{40}{8} = 5 A$$
  
$$\therefore \quad i_{through 6\Omega} = \frac{3}{3 + 6} \times 5 = \frac{5}{3} A$$
  
**27.** (d)



22

Resistance of each part = 5  $\Omega$ Their equivalent in parallel =  $\frac{5}{4}\Omega$ **28.** (a) Average speed =  $\frac{\text{total distance}}{1}$ time  $=\frac{\left(d+d\right)}{\frac{d}{6}+\frac{d}{3}}=\frac{2d}{\frac{3d}{6}}$ = 4 m/s**29.** (b)  $F = \frac{Gm_1m_2}{r^2}$ **30.** (b) f = -20 cm $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$  $\frac{1}{v} + \frac{1}{-30} = \frac{1}{-20}$  $\frac{1}{v} = \frac{-1}{20} + \frac{1}{30}$  $\frac{1}{v} = \frac{-3+2}{60}$ v = -60 cm**31.** (a) f = -15 cm $m=\,-\,3=\,\frac{v}{u}$  $\Rightarrow$  v = 3u  $\Rightarrow \quad \frac{1}{3u} + \frac{1}{u} = \frac{1}{-15}$  $\Rightarrow \quad \frac{4}{3u} = \frac{1}{-15}$ 3u = -60 $\Rightarrow$ u = -20 cm**32.** (b)  $\frac{V_{water}}{V_{glass}} = \frac{\frac{\ell}{T_1}}{\frac{3\ell}{2T_2}} = \frac{\mu_{glass}}{\mu_{water}}$  $\Rightarrow \quad \frac{2T_2}{3T_1} = \frac{\frac{3}{2}}{\frac{4}{3}}$  $\Rightarrow \quad \frac{T_2}{T_1} = \frac{27}{16}$  $\frac{T_1}{T_2} = \frac{16}{27}$ ÷ 33. (a)





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Convex mirror : diverging Concave mirror : converging Convex lens : converging Concave lens : diverging **34.** (d)

Resistance of bulb,  $R = \frac{V^2}{P}$ 

$$R = \frac{\left(50\right)^2}{100} = 25\Omega$$

 $\therefore \qquad R_{eq} \text{ in circuit} = 15\Omega + 25\Omega \\ = 40\Omega$ 

Since bulb and resistor are connected in series.

 $\therefore$  Voltage  $\propto$  Resistance

For maximum brightness, voltage across bulb should be 50V

- $\Rightarrow$  if 25 $\Omega$  gets 50V
- $\Rightarrow$  15 $\Omega$  gets 30V
- $\therefore \quad \text{Voltage of battery required} \\ = 50V + 30V = 80V$

**35.** (c)

 $12\,\Omega$  and  $4\,\Omega$  in parallel

 $\therefore$  their equivalent  $\frac{12 \times 4}{12 + 4} = 3 \Omega$ 

$$\therefore$$
 R<sub>eq</sub> = 2 + 3 = 5  $\Omega$ 

$$\therefore$$
 i = 2 A

Current through Ammeter is

$$=\frac{4}{4+12} \times 2 \text{ A} = \frac{2 \text{ A}}{4} = 0.5 \text{ A}$$

# BIOLOGY

- **36.** (d) Organism shown in figure (d) is Nereis Dioecious : (A plant or invertebrate animal) having the male and female reproductive organs in separate individuals.
  - $\rightarrow$  (a) is Earthworm, which are Hermaphrodite = Monoecious
  - $\rightarrow$  (b) is Chara, which is Monoecious
  - $\rightarrow$  (c) is Liverfluke, which are Hermaphrodite = Monoecious.
  - \* Monoecious = Hermaphrodite: A plant or an animal having both the male and female reproductive organs in the same individual.
- **37.** (c) Only statement (1) is correct.
  - \* In gymnosperms, endosperm is formed before fertilization and is haploid.
  - \* In angiosperms, endosperm is formed after fertilization and is triploid.
- **38.** (d) The organelles that are included in endomembrane system are-

Endoplasmic reticulum, Golgi complex, Lysosome and Vacuole.

**39.** (c) The sieve tubes of the phloem in angiosperms consist of sieve tube elements. These are cells which lose their nucleus, ribosomes and vacuoles at maturity.

They of course have cytoplasm and it is connected by channels to companion cells. The sieve tube elements retain mitochondria and plastids.

- **40.** (b)
- **41.** (c)



### **42.** (d)

A

- **43.** (c) Both mother and father are heterozygous for 'A' and 'B' blood group respectively.
  - \* When a cross is carried out between heterozygous father (for blood group B) and heterozygous mother (of blood group A) to get four children with different blood groups.



All the four blood groups are controlled by three allelic gene  $I^A$ ,  $I^B$ ,  $I^O$  and thus it shows phenomenon of multiple allelism. Both  $I^A$  and  $I^B$  is dominant over  $I^O$ .

**44.** (d) The process of blood clotting is a complex process which is mainly initiated and maintained by the platelets which circulate around the body along with other blood component.

In the region of injury, the platelets rupture and release a substance called <u>thromboplastin</u>. It converts protein <u>prothrombin</u> into <u>thrombin</u>. Thrombin then changes soluble fibrinogen protein into <u>fibrin</u>. The latter undergoes rapid polymerization to form long fibres. The fibres form a network over the damaged (injured) region, entrap blood corpuscles and form a blood clot.

- **45.** (d)
  - During the process of glycolysis, from 1 molecule of glucose (6C), 2 molecule of Pyruvic acid (3C) is formed.
  - \* In the presence of oxygen, breakdown of pyruvic acid takes place in mitochondria (Kreb's cycle), as a result 3 molecules of carbondioxide, water and energy is formed.
  - \* In absence of oxygen, the pyruvic acid is converted into Ethanol (2C), carbondioxide and energy.
  - \* In lock of oxygen, pyruvate is converted into lactic acid (3C) molecule and energy. The lactic acid in our muscle during sudden activity causes cramps.
- **46.** (c) Stored as body tissues.
- **47.** (b) Parathyroid gland

Parathyroid gland secretes parathormone (PTH). When the blood calcium level is below normal, then parathormone is selected. Parathormone from parathyroid glands and calcitonin from thyroid gland act antagonistically to regulate the calcium phosphorus balance in the blood.

```
48. (c)
```

**49.** (b)

- \* The cells of <u>connective tissue</u> are loosely spaced and embedded in an intracellular matrix (1)
- \* <u>Bone</u> (2) is a type of connective tissue, which is a non-flexible tissue. Bone cells are embedded in a hand matrix.
- \* Canaliculus (3), contains slender process of bone cell or osteocyte.
- \* In the matrix of bone are present longitudinal canals (4) called <u>Haversian Canals</u>, which contains blood vessels and nerve fibres.
- \* <u>Areolar tissue</u> (5) is a type of connective tissue found between the skin and muscles, around blood vessels and nerves and in the bone marrow.

**50.** (b)





\* \* \* \* \*

