



सत्यमेव जयते

रेल भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS



सी ई एन आर आर बी - ०२/२०२४ - CEN RRB - 02/2024

Test Date	30/12/2024
Test Time	4:30 PM - 6:00 PM
Subject	RRB Technicians Grade III

* Note

Correct Answer will carry 1 mark per Question.

Incorrect Answer will carry 1/3 Negative mark per Question.

1. Options shown in green color with a tick icon are correct.

2. Chosen option on the right of the question indicates the option selected by the candidate.

Section : RRB Technicians Grade III

Q.1 In a parallelogram two adjacent sides are in the ratio 2 : 3 and the perimeter is 60 cm. The length of each of the two shorter sides of this parallelogram is:

- Ans**
1. 12 cm
 2. 13 cm
 3. 19 cm
 4. 18 cm

Q.2 1 kW power is equal to _____. (kW stands for kilowatt.)

- Ans**
1. 1 J/s
 2. 1000 J/s
 3. 10 J/s
 4. 100 J/s

Q.3 A and B invest ₹30,000 and ₹24,000, respectively, for one year. If they get a profit of ₹13,500, then the share of A in the profit will be:

- Ans**
1. ₹7,500
 2. ₹9,450
 3. ₹9,000
 4. ₹6,000

Q.4 Which of the following is NOT an example of homogeneous mixture?

- Ans**
1. A mixture of copper sulphate in water
 2. A mixture of sugar in water
 3. A mixture of salt in water
 4. A mixture of iron nails in water

Q.5

Ans

1. $R_{eq} = R_1 + \frac{R_2 R_3}{R_2 + R_3}$

2. $I = I_1 + I_2 + I_3$

3. $\frac{1}{I} = \frac{1}{I_1} + \frac{1}{I_2} + \frac{1}{I_3}$

4. $R_{eq} = R_3 + \frac{R_2 R_1}{R_2 + R_1}$

Q.6

The power input in a circuit P can be expressed in terms of voltage V and current I in the circuit as follows:

Ans

1. $P = V/I$

2. $P = V^2 / I$

3. $P = VI$

4. $P = V^2 I$

Q.7

What is the measure of each exterior angle of a regular octagon?

Ans

1. 30°

2. 60°

3. 45°

4. 80°

Q.8

Who took oath as Chief Minister for the second time and the first to assume office after the scrapping of Article 370 in Jammu and Kashmir?

Ans

1. Mehbooba Mufti

2. Shri Farooq Abdullah

3. Shri Manoj Sinha

4. Shri Omar Abdullah

Q.9

The danger signal lights are usually red in colour because red is:

Ans

1. highest reflected by fog or smoke

2. least scattered by fog or smoke

3. not scattered at all by fog or smoke

4. highest scattered by fog or smoke

Q.10

Which of the following can increase the work done by a force on an object?

Ans

1. Increasing the displacement.

2. Reducing the displacement.

3. Reducing the force.

4. Reducing the mass.

Q.11

- Ans
1. Muscle tissues are made up of cuboidal cells.
 2. Special contractile proteins are present in muscles.
 3. Microscopes reveal alternate light and dark bands in voluntary muscles.
 4. The limbs have voluntary muscles.

Q.12 The average of thirteen consecutive integers is 36. If two times the smallest of these 13 integers is added to the largest of these 13 integers, what will be the sum obtained?

- Ans
1. 102
 2. 115
 3. 121
 4. 110

Q.13 In a certain code language, 'ROAM' is coded as '2835' and 'MORE' is coded as '4538'. What is the code for 'A' in the given code language?

- Ans
- 1.
 2. 8
 3. 5
 4. 2

Q.14 If A means +, B means −, C means ×, D means ÷, then what will come in place of the question mark (?) in the following equation?

$$21 \text{ D } 3 \text{ B } 4 \text{ C } 5 \text{ A } 22 = ?$$

- Ans
1. 10
 2. 8
 3. 9
 4. 7

Q.15 What is the SI unit of universal gravitational constant G?

- Ans
1. $\text{N m}^2/\text{kg}^{-1}$
 2. $\text{N m}^2/\text{kgs}^{-1}$
 3. N kgm^2
 4. $\text{N m}^2/\text{kg}^2$

Q.16 Which of the following unicellular organism change their shape?

- Ans
1. Yeast
 2. Amoeba
 3. Paramoecium
 4. Bacteria

Q.17

Ans

- 1. $\frac{-53}{13}$
- 2. $\frac{-55}{13}$
- 3. $\frac{-51}{13}$
- 4. $\frac{-54}{13}$

Q.18 Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which pair does not belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster.)

Ans

- 1. OJ-MP
- 2. SN-QU
- 3. QL-OR
- 4. UP-SV

Q.19 Two pipes A and B can fill the tank in 40 and 60 minutes, respectively. Both the pipes are opened together. After how many minutes should the pipe B be turned off, so that the tank be fill in 30 minutes?

Ans

- 1. 15 min
- 2. 25 min
- 3. 20 min
- 4. 28 min

Q.20 What is the title of the book by Nandan Kamath that won the Sports Book of the Year award in 2024?

Ans

- 1. Playing It My Way
- 2. Boundary Lab
- 3. Spirit of Sports
- 4. The Winning Mindset

Q.21 What was India’s rank in the 2024 Global Hunger Index (GHI), a tool used to measure and track hunger at the global, regional and national levels?

Ans

- 1. 105
- 2. 119
- 3. 111
- 4. 110

Q.22 Which of the following is/are called biological catalysts?

Ans

- 1. Digestive juices
- 2. Enzymes
- 3. Hydrochloric acid
- 4. Mucus

Q.23

Ans

1. Neither conclusion (I) nor (II) follows.
2. Only conclusion (I) follows.
3. Only conclusion (II) follows.
4. Both conclusions (I) and (II) follow.

Q.24 The term 'Catenation' is used to define a unique property of carbon. Which of the following gives the correct definition of catenation?

Ans

1. Unique ability to form bonds with other atoms of hydrogen.
2. Unique ability to form bonds with other atoms of carbon.
3. Unique ability to form bonds with other atoms of oxygen.
4. Unique ability to form bonds with other atoms of nitrogen.

Q.25 Which of the following forms a common passage for both the sperms and urine in males?

Ans

1. Scrotum
2. Urethra
3. Urinary bladder
4. Vas deferens

Q.26 The average of Kanchan's marks in 7 subjects is 75. Her average in six subjects excluding Science is 72. How many marks did she get in Science?

Ans

1. 90
2. 93
3. 95
4. 72

Q.27 Which new initiative was launched by the government on National Sports Day 2024?

Ans

1. Retired Sportsperson Empowerment Training (RESET) Programme
2. National Fitness Challenge
3. Fit India Movement
4. National Sports Scholarship Scheme

Q.28 What is the value of x for balanced chemical equation $3\text{Fe} + x\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$?

Ans

1. 5
2. 1
- 3.
- 4.

Q.29

Ans

- 1. $2(a - b)(b - c)(c - a)$
- 2. $(a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$
- 3. $3(a - b)(b - c)(c - a)$
- 4. $(a - b)(b - c)(c - a)$

Q.30

Refer to the given series and answer the question that follows (all numbers are single-digit numbers only, and all counting is to be done from left to right).

(Left) 2 2 4 8 2 4 6 4 2 6 8 8 6 7 4 5 3 6 2 8 7 1 3 3 6 8 6 4 (Right)

How many such odd digits are there, each of which is immediately preceded by a perfect square and immediately followed by an even digit?

(Note: 1 will be considered as a perfect square.)

Ans

- 1. 1
- 2. 0
- 3.
- 4. 2

Q.31

The greatest number among $\sqrt{2}$, $3^{1/3}$, $4^{1/4}$ is:

Ans

- 1. All are equal
- 2. $4^{1/4}$
- 3. $3^{1/3}$
- 4. $\sqrt{2}$

Q.32

Most mature plant cells have a _____ that helps to maintain the turgidity of the cell and store important substances including wastes.

Ans

- 1. small ribosome
- 2. large central vacuole
- 3. leucoplasts
- 4. chromoplasts

Q.33

Find one-third part of a number whose one-third part exceeds the one-fifth part by 6.

Ans

- 1. 24
- 2. 15
- 3. 5
- 4. 45

Q.34

- Ans
1. NK-PL-QR
 2. OK-PL-QS
 3. NK-PM-QS
 4. OK-PM-QR

Q.35 If the roots of a plant always grow downwards due to geotropism, then the growth of pollen tubes towards ovules is due to _____.

- Ans
1. phototropism
 2. geotropism
 3. hydrotropism
 4. chemotropism

Q.36 Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(12, 38, 26)

(50, 75, 25)

- Ans
1. (8, 32, 7)
 2. (21, 40, 15)
 3. (9, 28, 16)
 4. (14, 42, 28)

Q.37 Which of the following is NOT an abiotic component of the ecosystem?

- Ans
1. Rainfall
 2. Grass
 3. Wind
 4. Soil

Q.38 The fragmentation method of reproduction is shown in _____.

- Ans
1. Spirogyra
 2. Amoeba
 3. Plasmodium
 4. Hydra

Q.39

- Ans
- 1. (100, 16, 64)
 - 2. (80, 16, 60)
 - 3. (80, 16, 64)
 - 4. (80, 14, 64)

Q.40 At which event was Ram Charan awarded the title of Ambassador for Indian Art and Culture?

- Ans
- 1. Cannes Film Festival 2024
 - 2. Toronto International Film Festival 2024
 - 3. Indian Film Festival of Melbourne (IFFM) 2024
 - 4. International Film Festival of India 2024

Q.41 ATP is broken down giving rise to a fixed amount of energy that can drive the endothermic reactions taking place in which cell organelle of a cell?

- Ans
- 1. Mitochondria
 - 2. Ribosome
 - 3. Chloroplast
 - 4. Lysosome

Q.42 Refer to the given series and answer the question that follows (all numbers are single-digit numbers only, and all counting is to be done from left to right).

(Left) 2 1 6 8 3 9 5 2 7 6 3 2 9 9 7 3 9 6 4 6 3 2 6 2 2 0 3 4 7 2 (Right)

How many such even digits are there, each of which is immediately preceded by an odd digit and also immediately followed by an odd digit?

- Ans
- 1. 5
 - 2.
 - 3. 2
 - 4.

Q.43 $\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2\text{(aq)} + \text{Heat}$, this reaction is called:

- Ans
- 1. decomposition reaction
 - 2. combination reaction
 - 3. Wurtz fittig reaction
 - 4. Wurtz reaction

Q.44 In a certain code language, 'BEAM' is coded as '9483' and 'DAME' is coded as '9683'. What is the code for 'B' in the given code language?

- Ans
- 1.
 - 2. 8
 - 3. 9
 - 4.

Q.45

- Ans
- 1.
 2. Violet
 3. Yellow
 4. Blue

Q.46 When three parallel lines are cut by two transversals and the intercepts made by the first transversal are in the ratio 3 : 5, then the intercepts made by the second transversal are in the ratio _____.

- Ans
1. 3 : 5
 2. 9 : 25
 3. 3 : 2
 4. 1 : 1

Q.47 If the matrix of bone cells contains calcium and phosphorus compounds, then what do we find in the matrix of cartilage?

- Ans
1. Proteins and sugars
 2. Proteins and fats
 3. Phosphorus and sugars
 4. Calcium and sugars

Q.48 Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster does not belong to that group?

(Note: The odd man out is not based on the number of consonants/vowels or their position in the letter cluster)

- Ans
1. EMS
 2. AHO
 3. HOV
 4. VCJ

Q.49 The simplified value of $\sqrt{1.0816}$ is:

- Ans
1. 0.904
 2. 1.35
 3. 1.286
 4. 1.04

Q.50 At what rate (in percentage) per annum will ₹1,300 give ₹520 as simple interest in 8 years?

- Ans
1. 8%
 2. 7%
 3. 4%
 4. 5%

Q.51 Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?

HLG, KOJ, NRM, QUP, ?

- Ans
1. TXS
 2. XST
 - 3.
 - 4.

Q.52

- Ans
- 1. 10 cm
 - 2. 25 cm
 - 3. 30 cm
 - 4. 20 cm

Q.53 By which unit do the successive members of the homogenous series CH₄, C₂H₆, and C₃H₈ differ from each other?

- Ans
- 1. CH₃
 - 2. CH
 - 3. CH₄
 - 4. CH₂

Q.54 Parbati Baruah was awarded the Padma Shri-2024. For which achievement is she known?

- Ans
- 1. Lion conservation
 - 2. Rhino conservation
 - 3. First woman mahout
 - 4. Tiger conservation

Q.55 Two numbers are respectively 30% and 37% less than a third number. What percentage of the first number is the second number?

- Ans
- 1. 10%
 - 2. 80%
 - 3. 90%
 - 4. 20%

Q.56 Nayab Singh Saini was appointed the Chief Minister of _____ in October 2024.

- Ans
- 1. Himachal Pradesh
 - 2. Haryana
 - 3. Jharkhand
 - 4. Punjab

Q.57 Simplify the given expression.

$10 + 8 + 6 - 48 \div (4 \times 6)$

- Ans
- 1. -1
 - 2. 22
 - 3. 26
 - 4. 12

Q.58 Seven people, A, B, E, G, P, Q and R, are sitting in a row, facing north. Only two people sit to the left of B. Only three people sit between B and R. P sits second to the right of B. Only two people sit between P and A. G sits at some place to the right of E but at some place to the left of Q. How many people sit to the right of G?

- Ans
- 1. Three
 - 2. Four
 - 3. One
 - 4.

Q.59

- Ans
1. Four
 2. Three
 3. One
 - 4.

Q.60 Which of the following options should come in place of the question mark (?) in the given series based on the English alphabetical order?

MPL, ORN, QTP, SVR, ?

- Ans
1. UXT
 2. XTU
 3. UTX
 4. XUT

Q.61 After fertilisation, which of the following develops a tough coat, is gradually converted into a seed and the zygote divides several times to form an embryo within it?

- Ans
1. Ovary
 2. Gynoecium
 3. Ovule
 4. Pistil

Q.62 Which of the following reactions is an example of double displacement reaction?

- Ans
1. $\text{Fe(s)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{FeSO}_4 \text{ (aq)} + \text{Cu(s)}$
 2. $\text{Na}_2 \text{SO}_4 \text{ (aq)} + \text{BaCl}_2 \text{ (aq)} \rightarrow \text{BaSO}_4 \text{ (s)} + 2\text{NaCl (aq)}$
 3. $\text{Pb(s)} + \text{CuCl}_2 \text{ (aq)} \rightarrow \text{PbCl}_2 \text{ (aq)} + \text{Cu(s)}$
 4. $\text{Zn(s)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{ZnSO}_4 \text{ (aq)} + \text{Cu(s)}$

Q.63 The value of $\sin^2 \theta + \cos^2 \theta - (\sec^2 \theta - \tan^2 \theta) + \tan \theta \cos \theta + \sin \theta$ is _____.

- Ans
1. $\sec^2 \theta$
 2. $2\sin \theta$
 3. -1
 4. 0

Q.64 Ramesh has borrowed an amount of ₹2,00,000 from a bank to start a business. How much simple interest will he pay at a rate of 11% per annum after 2 years?

- Ans
1. ₹44,000
 2. ₹44,600
 3. ₹45,500
 4. ₹46,000

Q.65

Ans

1. 25%
2. 20%
3. 15%
4. 12%

Q.66 Which of the following banks launched a special debit card for visually impaired customers in October 2024?

Ans

1. State Bank of India
2. Punjab National Bank
3. HDFC Bank
4. Canara Bank

Q.67 The cause of being the refractive index(μ) of transparent medium > 1 , is:

Ans

1. Speed of light in vacuum $>$ speed of light in transparent medium
2. Speed of light in vacuum $<$ speed of light in transparent medium
3. Wavelength of light gets change as it moves from denser to rarer medium
4. Speed of light in vacuum = speed of light in transparent medium

Q.68 If the cross-sectional area of a conductor is doubled, other factors remaining the same, the resistivity of the conductor will be:

Ans

1. same
2. one fourth
3. halved
4. doubled

Q.69 Which of the following statements is correct for a homogeneous mixture of sugar in water?

Ans

1. Water is the solvent.
2. Sugar is the solvent.
3. Water is the solute.
4. Both water and sugar are solvents.

Q.70 Evaluate the given expression.

$$5 \times 3 - 12 \div 4 + 8$$

Ans

- 1.
- 2.
3. 20
4. 14

Q.71 Swarna runs at a speed of 10 km/h. How long will she take to cover 200 m?

Ans

1. 120 seconds
2. 54 seconds
3. 90 seconds
- 4.

Q.72

- Ans
- 1.
 2. Helium
 3. Nitrogen
 4. Oxygen

Q.73 Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts and decide which conclusion(s) logically follow(s) from the given statements.

Statements:

Some games are boards.

No board is a dice.

No remote is a game.

Conclusions:

(I) No game is a dice.

(II) Some remotes are boards.

- Ans
1. Only conclusion (II) follows.
 2. Both conclusions (I) and (II) follow.
 3. Neither conclusion (I) nor (II) follows.
 4. Only conclusion (I) follows.

Q.74 A retailer permits a trade discount of 25%, followed by a cash discount of 8%, on an article. The net percentage of discount is:

- Ans
1. 33%
 2. 34%
 3. 32%
 4. 31%

Q.75 Lavanya got married 10 years ago. Now her age is $1\frac{1}{5}$ times her age at the time of marriage. Her son's present age is one-tenth of her present age. Find her son's present age.

- Ans
1. 6 years
 2. 5 years
 3. 20 years
 4. 12 years

Q.76 Which of the following scientists proposed the 'Law of Constant Proportions'?

- Ans
1. JJ Thomson
 2. Joseph Proust
 3. Ernest Rutherford
 4. E Goldstein

Q.77

- Ans
- 1. 0
 - 2. 2
 - 3.
 - 4.

Q.78 Which of the following describes dendrites?

- Ans
- 1. Short and branched
 - 2. Long and branched
 - 3. Short and unbranched
 - 4. Long and unbranched

Q.79 In which of the following situations is potential energy being stored?

- Ans
- 1. Pushing a vehicle on the plane road
 - 2. Moving a pencil across a table
 - 3. Stretching a rubber band
 - 4. Lighting a matchstick

Q.80 Two numbers are less than a third number by 30% and 37%, respectively. By what percentage is the second number less than the first?

- Ans
- 1. 15%
 - 2. 8%
 - 3. 12%
 - 4. 10%

Q.81 On 30th September 2024, Union Minister for Information and Broadcasting Ashwini Vaishnaw announced that the jury had selected veteran film actor _____ as the recipient of the prestigious Dadasaheb Phalke Lifetime Achievement Award for 2022.

- Ans
- 1. Rajinikanth
 - 2. Mithun Chakraborty
 - 3. Shah Rukh Khan
 - 4. Asha Bhosle

Q.82

Ans

- 1. Wife's mother
- 2. Mother's sister
- 3. Mother's mother
- 4. Father's mother

Q.83 The centre of curvature of a concave mirror lies _____ the mirror, whereas it lies _____ the mirror for a convex mirror.

Ans

- 1. behind, behind
- 2. behind, in front of
- 3. in front of, in front of
- 4. in front of, behind

Q.84 Which of the following options represents the number of neutrons present in aluminium?

Ans

- 1. 13
- 2. 14
- 3. 15
- 4. 27

Q.85 SDFG is related to YJKM in a certain way based on the English alphabetical order. In the same way, QBZE is related to WHEK. To which of the following options is ITOW related, following the same logic?

Ans

- 1. OZTC
- 2. HBCT
- 3. RYOM
- 4. MJVY

Q.86 Identify the name of an alloy formed when mix of copper and tin (Cu and Sn)?

Ans

- 1. Brass
- 2. Solder
- 3. Gold
- 4. Bronze

Q.87 Which of the following options should come in place of the question mark (?) in the given series to make it logically complete?

81, 108.6, 136.2, 163.8, ?

Ans

- 1. 198.2
- 2. 191.4
- 3. 183.6
- 4.

Q.88

Ans

1. Centripetal force
2. Coriolis force
3. Coulomb force
4. Centrifugal force

Q.89 Select the correct statement related to the characteristics of prokaryotic cell.

Ans

1. It has more than one chromosome.
2. Nuclear region is well defined and surrounded by nuclear membrane.
3. It has a single chromosome.
4. Membrane bound cell organelles are present.

Q.90 Gautam starts from Point A and drives 30 km towards South. He then takes a left turn, drives 15 km, turns left and drives 42 km. He then takes a left turn and drives 7 km. He takes a final left turn, drives 12 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again?

(All turns are 90 degree turns only unless otherwise specified.)

Ans

1. 5 km towards West
2. 8 km towards West
3. 10 km towards West
4. 10 km towards East

Q.91 Which of the following chemical reactions represents the displacement reaction?

Ans

1. $2\text{AgCl(s)} \rightarrow 2\text{Ag(s)} + \text{Cl}_2\text{(g)}$
2. $\text{C(s)} + \text{O}_2\text{(g)} \rightarrow \text{CO}_2\text{(g)}$
3. $\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2\text{(aq)}$
4. $\text{Zn(s)} + \text{CuSO}_4\text{(aq)} \rightarrow \text{ZnSO}_4\text{(aq)} + \text{Cu(s)}$

Q.92 What will come in the place of the question mark '?' in the following equation, if '+' and '÷' are interchanged and '×' and '-' are interchanged?

$$11 \div 12 + 4 - 5 \times 6 = ?$$

Ans

1. 22
2. 28
3. 16
4. 20

Q.93 B, C, D, E, F, K and L are sitting around a circular table, facing the centre. D sits to the immediate right of E. Only three people sit between E and L. B sits to the immediate right of C. Only three people sit between D and F when counted from the left of D. How many people sit between K and C when counted from the left of C?

Ans

1. Four
2. One
- 3.
4. Three

Q.94

- Ans
1. 10 crore
 2. 20 crore
 3. 5 crores
 4. 15 crore

Q.95 Which of the following after fertilisation grows rapidly and ripens to form a fruit. Meanwhile, the petals, sepals, stamens, style and stigma may shrivel and fall off?

- Ans
1. Ovule
 2. Ovary
 3. Gynoecium
 4. Pistil

Q.96 In this question, a statement is followed by two courses of actions, numbered I and II. You must assume everything in the statement to be true and on the basis of the information given in the statement, decide which of the course of action/s logically follow for pursuing.

Statement – In City X, the number of car accidents has spiked recently due to poor road conditions and lack of adequate signage.

I. The city should launch an awareness campaign to educate drivers on safe driving practices.

II. Immediate Road repair and installation of proper signage should be carried out.

- Ans
1. Only I follows
 2. Neither I nor II follows
 3. Both I and II follow
 4. Only II follows

Q.97 TakeMe2Space (TM2Space), an innovative space technology firm, is based in which city of India?

- Ans
1. New Delhi
 2. Kolkata
 3. Hyderabad
 4. Chennai

Q.98 Where should the object be placed around the concave mirror to ensure that the size of the image is the same as the size of the object?

- Ans
1. Between focus F and centre of curvature C
 2. At focus F
 3. At C, centre of curvature
 4. Between focus F and pole P

Q.99

- Ans**
1. 5 hours
 2. 6 hours
 3. 8 hours
 4. 7 hours

Q.100 A student in a lab noted the pH value of a solution to be 10. Which of the following statements is correct about a solution?

- Ans**
1. A solution is basic with a high hydrogen ion concentration.
 2. A solution is acidic with a high hydrogen ion concentration.
 3. A solution is basic with a high hydroxide ion concentration.
 4. A solution is acidic with a high hydroxide ion concentration.