

Please mark with an "X" the letter corresponding to the right answer

1 Which among the following acids is present in a human stomach?

- A Sulphuric acid
- B Hydrochloric acid
- C Nitric acid
- D Picric acid
- E None of the above

2 The major role of the white blood cell is

- A To defend from the infections
- B To provide energy
- C To help in blood clotting
- D To help in breathing
- E None of the above

3 Malfunctioning of causes diabetes

- A Heart
- B Kidneys
- C Pancreas
- D Spleen
- E None of the above

4 Which among the following terms define the scientific study of teeth?

- A Odontology
- B Ophthalmology
- C Omithology
- D Osteology
- E None of the above

5 Which among the following is invented by Edward Jenner?

- A Inoculation of TB
- B Inoculation of yellow fever
- C Inoculation of polio
- D Inoculation of smallpox
- E None of the above

6 Who among the following has discovered penicillin?

- A Alexander Fleming
- B Robert Hook
- C Christopher Columbus
- D Pierre Simon Laplace
- E None of the above

7 Chromosomes are:

- A Found only in the cytoplasm of a cell
- B The highest in number in human cells
- C Carrying genetic information in the form of genes
- D Visible in all cells at every time
- E None of the above

8 In the process of photosynthesis, chlorophyll ...

- A Absorbs sunlight
- B Absorbs water
- C Absorbs carbon dioxide
- D Releases oxygen
- E None of the above

9 Which among the following correctly defines the sea horse?

- A Fish class
- B Mammals class
- C Reptiles class
- D Mollusk class
- E None of the above

10 The Hepatitis-B, which affects the human liver, is a ...

- A Virus
- B Bacterium
- C Protozoan
- D Helminth
- E None of the above

- 11 Which among the following hormones controls production of the thyroid?**
- A Melatonin
 B TS hormone
 C Progesterone
 D Testosterone
 E None of the above
- 12 Which among the following is accountable for the maximum fixation of solar energy?**
- A Bacteria
 B Protozoa
 C Fungi
 D Green plants
 E None of the above
- 13 Which among the following blood groups is a universal donor?**
- A Blood group AB
 B Blood group A
 C Blood group B
 D Blood group O
 E None of the above
- 14 Consider the following statements:**
1. RNA is ribonucleic acid.
 2. RNA is used for information transport (known as mRNA).
- Choose the correct answer from the given codes:
- A Only 1
 B Only 2
 C Both
 D Neither 1 nor 2
 E None of the above
- 15 Which among the following is essential in food digestion?**
- A Enzyme
 B Water
 C Air
 D Mineral
 E None of the above
- 16 Which among the following is a hereditary disease?**
- A Cholera
 B TB
 C Haemophilia
 D Cancer
 E None of the above
- 17 Consider the following statements:**
1. The best-known role of proteins in the cell is as enzymes.
 2. Enzymes catalyze chemical reactions.
- Choose the correct answer from the given codes:
- A Only 1
 B Only 2
 C Both
 D Neither 1 nor 2
 E None of the above
- 18 Thrombosis is ...**
- A Formation of a blood clot in a blood vessel
 B Contagious virus disease
 C Skin disease
 D Heart disease
 E None of the above
- 19 The organism that eats everything is known as ...**
- A Herbivores
 B Carnivores
 C Autotrophs
 D Omnivores
 E None of the above

- 20 Consider the following statements:**
 1. Cells are of two types, eukaryotic and prokaryotic.
 2. Plants consist eukaryotic cells and animals consist prokaryotic cells.
 Choose the correct answer from the given codes:
 A Only 1
 B Only 2
 C Both
 D Neither 1 nor 2
 E None of the above
- 21 A cheetah can accelerate from rest to a speed of 30.0 m/s in 7.00 s. What is its acceleration?**
 A 0.23 m/s^2
 B 21 m/s^2
 C 4.29 m/s^2
 D 9.8 m/s^2
 E None of the above
- 22 Starting from the rest, an ambulance with an acceleration of 2.50 m/s^2 , in 10 seconds cover a distance of?**
 A 125 m
 B 62.5m
 C 62.5 m/s
 D 62.5 m/s^2
 E 25 m
- 23 A 63.0-kg sprinter starts a race with an acceleration of 4.20 m/s^2 . What is the net external force on him?**
 A 1111 N
 B 265 N
 C 0.07 N
 D 15 N
 E None of the above
- 24 In a uniform circular motion..**
 A there is a constant velocity
 B there is not a constant speed
 C the velocity is zero
 D there is no acceleration
 E None of the above
- 25 A car travels 2 km in 100 s. What is the average speed?**
 A 20 m / s
 B 50 m / s
 C 0,02 m / s
 D -0,02 m / s
 E 5 m / s
- 26 What is the energy needed to lift a 30 kg box by one meter?**
 A 30 J
 B 294 J
 C 300 W
 D 30W
 E None of the above
- 27 What is the power output in watts of a shot-putter who takes 1.20 s to accelerate the 7.27-kg shot from rest to 14.0 m/s, while raising it 0.8 meters?**
 A 641J
 B 98J
 C 98W
 D 641W
 E None of the above
- 28 How high must climb the stairs, an 80 kg man, to burn 1000kj (about 250 Kcal) of a chocolate bar?**
 A 1.275m
 B 12.75m
 C 127.5m
 D 1275m
 E 12750m
- 29 Select the correct expression equivalent to $5^2 + 2^2$**
 A $(5 + 2)^2$
 B 7^2
 C $(5 + 2)^4$
 D $\sqrt{29^2}$
 E None of the above

- 30 If $e = mc^2$, then c is given by
- A e/m
 B $(e/m)^{1/2}$
 C $(m/e)^{1/3}$
 D $(m/e)^{1/2}$
 E None of the above
- 31 If $x=0.2456E+01$ (output of your scientific calculator), select the correct approximation with rounding up to two significant digits
- A $0.24E+01$
 B $0.246E+01$
 C $0.245E+01$
 D $0.25E+01$
 E None of the above
- 32 Let x be a concentration of a certain quantity given by the solution of $x^2 - K = 0$. Select the correct answer.
- A $x = \pm\sqrt{K}$
 B $x = \sqrt{|K|}$ for any K
 C $x = \sqrt{K}$, if $K > 0$
 D $x=K$
 E None of the above
- 33 Mark the correct solution of the equation $e^x = -1$
- A $-1/e$
 B $\ln(-1)$
 C no solution
 D $x = \log_{10}e$
 E None of the above
- 34 Compute the sum of $5/9 + 8/15$
- A $49/45$
 B $13/24$
 C $13/15$
 D $50/45$
 E None of the above
- 35 $x^4 - y^4$ is equivalent to
- A $(x - y)(x + y)(x^2 + y^2)$
 B $(x^2 - y^2)^2$
 C $y^4 - x^4$
 D $(x - y)^4$
 E None of the above
- 36 In alkali solutions, hydrogen peroxide (H_2O_2) converts the sulphide anion (S^{2-}) into sulphate anion (SO_4^{2-}). Which sentence is correct?
- A Sulphur oxidation state goes from +2 to +6 and is oxidised
 B Sulphur oxidation state goes from +2 to +6 and is reduced
 C Sulphur oxidation state goes from -2 to +6 and is oxidised
 D Sulphur oxidation state goes from -2 to +6 and is reduced
 E Sulphur oxidation state goes from -2 to -6 and is reduced
- 37 Phosphate anion brutto formula is:
- A HPO_3^{2-}
 B PO_4^{3-}
 C $H_2PO_2^{2-}$
 D $P_2O_7^{2-}$
 E PO_4^{2-}
- 38 The molar mass of nitrogen (N) is 14 gmol^{-1} . How many atoms are contained into 0.7 g of N?
- A 0.05
 B 6.022×10^{22}
 C 3.011×10^{22}
 D 5.902×10^{24}
 E 0.7×10^{23}
- 39 The pH of a H_3O^+ 0.0001 M water solution is:
- A 3
 B 5
 C 10
 D 4
 E 7

- 40** How many grams of ethanol ($\text{CH}_3\text{CH}_2\text{OH}$, $\text{MW}=46.068$) are into 500 mL of a 2M solution?
- A About 23
 B About 4.6
 C About 46
 D About 2.3
 E About 0.46
- 41** Methylamine is:
- A An ionic compound
 B A compound with a hydroxyl group
 C A compound with a NH_2 group
 D A hydrocarbon
 E A compound containing a heavy metal
- 42** Which of these atom pairs give ionic bonds?
- A C,H
 B C,F
 C N,H
 D H,I
 E Na,F
- 43** A solution of water and methanol (completely miscible) constitute a system:
- A Chemically and physically homogeneous
 B Chemically homogeneous but physically heterogeneous
 C Physically homogeneous but chemically heterogeneous
 D Chemically and physically heterogeneous
 E That can be separated by filtration
- 44** Which chemical reaction occurs in a car engine?
- A Precipitation
 B Hydrolysis
 C Redox
 D Saponification
 E Combustion
- 45** If the pH of a solution varies from 3 to 6, H_3O^+ concentration:
- A Becomes the half
 B Doubles
 C Decreases by 1000 times
 D Increases of 5 units
 E Increases by 1000 times
- 46** To neutralize 200 mL of NaOH 0.01M you need:
- A 200 mL of KOH 0.01M
 B 200 mL of H_2O
 C 200 mL of HNO_3 10^{-1} M
 D 20 mL of HNO_3 10^{-1} M
 E 2 mL of HCl 10^{-2} M
- 47** At $T=0^\circ\text{C}$ and $P=1$ atm, 4 moles of gas:
- A Weigh about 89.6 g
 B Occupy a volume of 22.4 L
 C Occupy a volume of 89.6 L
 D Weigh about 4 g
 E Contain about 4 molecules
- 48** Which of the following ratios is a concentration?
- A Force/Area
 B Mass/Volume
 C Charge/Length
 D Number of moles/Volume
 E Number of molecules/Number of moles
- 49** If 5 g of ZnCl_2 are dissolved into water and the final solution is diluted to 100 mL with water, the concentration is:
- A 5g/L
 B 50g/L
 C 500g/L
 D 0.5g/L
 E 0.05g/L
- 50** Which of the following elements is more reactive?
- A Na
 B C
 C O_2
 D N_2
 E Ar

- 51 What is the capital city of the Philippines?**
 A Jakarta
 B Manilla
 C Dili
 D Kuala Lumpur
 E None of the above
- 52 What is the capital city of Kenya?**
 A Dakkar
 B Nairobi
 C Lagos
 D Maputo
 E None of the above
- 53 What instrument did the jazz musician Miles Davis play?**
 A Saxophone
 B Trumpet
 C Piano
 D Guitar
 E None of the above
- 54 Who wrote the song entitled 'Yesterday'?**
 A Paul McCartney
 B Freddie Mercury
 C Mick Jagger
 D Steven Tyler
 E None of the above
- 55 World War I began in which year?**
 A 1923
 B 1938
 C 1917
 D 1910
 E None of the above
- 56 Who is the only president to serve more than two terms?**
 A George W Bush
 B George Washington
 C Ronald Reagan
 D Franklin D. Roosevelt
 E Abraham Lincoln
- 57 What scientist is well known for 'discovering' gravity?**
 A Aristotle
 B Albert Einstein
 C Isaac Newton
 D Galileo Galilei
 E None of the above
- 58 Which of these countries was considered part of the Axis in World War II?**
 A United Kingdom
 B China
 C Japan
 D France
 E None of the above
- 59 What important American document was put into effect in 1789?**
 A US Constitution
 B Declaration of Independence
 C Monroe Doctrine
 D Articles of Confederation
 E None of the above
- 60 What is the name of Adolf Hitler's infamous autobiography?**
 A Deutschlands Zukunft
 B Der Wahre Held
 C Die Jüdische Bedrohung
 D Mein Kampf
 E None of the above