

Questions from 1 to 4 are based on the following passages:

If milk is set to boil in a saucepan, it boils over. I do not know, and have never wanted to know, why this happens. If pressed, I should attribute it to a propensity in milk to boil over, which is true enough but explains nothing. In the same way one can read, or even write, about the events of the past without wanting to know why they happened, or be content to say, that Second World War occurred because Hitler wanted war, which is true enough but explains nothing. But one should not then commit the solecism of calling oneself if a student of history or a historian. The study of history is study of causes. The historian, continuously asks the question, why? And, as long as he hopes, he hopes, the hopes for answer, he cannot rest. The great historian or perhaps I should say more broadly, the great thinker is the man who asks the question, why? About new things or in new context.

1. **The passage is about:**
 - a) Milk boiling
 - b) Cause of second world war
 - c) History and historian
 - d) Hitler and war
2. **The passage defines history as:**
 - a) Record of events of the past
 - b) Study of events and the cause behind them
 - c) Study of second world war
 - d) Study of famous people like Hitler
3. **For a historian to be content to say that the Second World War occurred because Hitler wanted it is to commit solecism. Here the term solecism means:**
 - a) Mistake
 - b) Greatness
 - c) Crime
 - d) grammatical error
4. **According to the passage the job of a**

historian is :

- a) To write book without taking rest
- b) Always try to find out the causes of new things in new context
- c) To read history books
- d) To hope for a answer

5. **Ram Bahadur S.L.C in 1998.**
 - a) Has passed
 - b) Will have passed
 - c) passed
 - d) was passing
6. **Quite a few girls attended the entrance exam. It means that:**
 - a) There were many girls
 - b) There were no girls
 - c) There were very few girls
 - d) There number was beyond counting
7. **'I' The ninth alphabet in English.**
 - a) Am
 - b) is
 - c) was
 - d) were
8. **In the sentence 'by the way, have you ever visited a zoo?' by the way is used to indicate:**
 - a) The travel route
 - b) Topic change
 - c) Lack of interest in the talk
 - d) None of these
9. **Fifteen minutes....allowed to each speaker.**
 - a) Was
 - b) are
 - c) is
 - d) will
10. **The comparative form of well is.....**
 - a) Weller
 - b) better
 - c) best
 - d) worse
11. **The passive of 'nobody knew me in the Japan' is:**
 - a) Nobody was known in Japan
 - b) I am not known in Japan
 - c) I was not known in Japan
 - d) I did not know anybody in Japan.
12. **The indirect speech of 'where are you going' is:**
 - a) He asked me where I was going.
 - b) He said to me where I was going?
 - c) He told me where I was going.
 - d) He exclaimed me where I was going?
13. **A problem is given to three students whose chances of solving it are $\frac{1}{4}$, $\frac{1}{5}$ & $\frac{1}{6}$ respectively. Find the probability that the problem is solved ?**
 - a) $\frac{1}{2}$
 - b) $\frac{1}{4}$
 - c) $\frac{7}{10}$
 - d) $\frac{4}{5}$
14. **If any rows of a determinant are identical , then its value becomes**
 - a. 0
 - b. 1
 - c. 2
 - d. $\frac{1}{2}$

15. The centre of the circle $2x^2 + 2y^2 - 12x +$

$4y = 1$ is :

- a. (3, 2) b. (3, 24) \int_0
1)

- c. (3, -1) d. (-3, -1)

16. The distance of a particle in time 't' second is given by $s = t^3 - 6t^2 - 4t - 8$, its acceleration vanishes at time t equals to:

- a. 1 b. 2
c. 3 d. 4

17. Which of the following is one of the properties of absolute value of real number?

- a. $|x + y| \geq |x| + |y|$
b. $|x + y| > |x| + |y|$
c. $|x + y| \leq |x| + |y|$
d. $|x| \leq 0$

18. If $\cos(\sin^{-1} x) = 1 - \frac{1}{2}$, then the value of x is

- a. $\frac{\sqrt{3}}{2}$ b. $\frac{1}{2}$
c. $\frac{1}{\sqrt{2}}$ d. 0

19. A square matrix $A = \begin{bmatrix} -1 & 2 & -1 \\ -3 & 3 & 2 \end{bmatrix}$ is an

example of

- a. Idempotent matrix
b. Involuntary matrix
c. Nilpotent matrix
d. Orthogonal matrix

20. $\lim_{x \rightarrow 3} 0^{\frac{3-x}{x}}$ equals to :

- a. e^{-2} b. e^3
c. e^3 d. e^{-1}

21. If the sum of first n terms of a series is $2n^2 + 4n$, then its second term is :

- a. 8 b. 10
c. 12 d. 14

22. condition for a line $lx + my - n = 0$ to be tangent to a circle $x^2 + y^2 = a^2$ is :

$$\frac{a}{\sqrt{l^2 + m^2}} = \frac{n}{a^2}$$

c. $\tan^{-1} 1$

d. $\tan^{-1} -6$

$$\frac{\pi/2}{\theta} = \frac{y}{x}$$

$d\theta =$

- a. 0 b. 1
c. 3 d. 2

25. A reversible chemical reaction having two reactants is in equilibrium. If the concentration of the reaction is doubled, then the equilibrium constant will be:

- a. doubled.
b. halved.
c. become one fourth remain the Same
d. remain the same

26. Among the following metals, the one that doesn't liberate hydrogen from dilute H_2SO_4 is:

- a. Aluminium b. copper
c. magnesium d. zinc

27. the pH of a 0.005M aqueous solution of sulphuric acid is:

- a. 0.005 b. 1 c. 2 d. 0.01

28. Alkene group is represented by general formula :

- a. $C_n H_{2n}$ b. $C_n H_{2n-1}$
c. $C_n H_{2n+1}$ d. $C_n H_{2n+2}$

29. Which of the following food stuffs contains nitrogen ?

- a. Carbohydrate b. protein
c. phospholipids d. fat

30. The mass of one avogadro number of

molecule is termed as:

- a. Molar mass b. mole
c. atomic mass d. molecular mass

31. Which of the following compound is most basic compound?

- a. Benzyl amine b. propyne
c. propene d. propanol

32. Cellulose is a polymer containing the monomer :

- a. $n^2 = a^2(1 - m^2)$ b. Ribose
c. fructose
d. glucose

c. $a^2 = n^2(1 - m^2)$ d. starch

$$\frac{n^2}{a^2} = \frac{1}{1 - m^2}$$

1

$$(1 + m^2)$$

23. Angle of intersection of curves $y = x^2$ & x

=
y² is

a. $\tan^{-1} \frac{4}{3}$

3

-

b. $\tan^{-1} \frac{3}{4}$

4

- a. NH_4Cl
- c. Zn

33. In a dry cell, the depolarizer is:

- b. MnO_2
- d. charcoal powder

34. Successive alkanes in homologous series differ by:

- a. CH₂ b. CH
c. CH₃ d. C₂H₄
35. Adenosine is an example of:
a. Nucleoside b. purine
c. nucleotide d. pyrimidine base
36. Highest electron affinity is shown by:
a. O⁻ b. Cl₂
c. F⁻ d. F₂
37. A particle is moving along X-axis in such a way that its coordinate x varies with time t according to the expression $x = 2 + 5t - 6t^2$ where x is in meter and t is in second. The initial velocity of the particle is:
a. 5m/s b. -3m/s
c. 6m/s d. -12m/s
38. Two bodies are at temperature 27°C and 927°C. The heat energy radiated by them will be in the ratio:
a. 1:4 b. 1:64
c. 1:16 d. 1:256
39. Two sound waves having a phase difference of 60 have a path difference of:
a. λ b. $\lambda/2$
c. $\lambda/4$ d. $\lambda/6$
40. The magnetic field due to a long solenoid carrying a current I is proportional to:
a. I b. I²
c. I³ d. I⁻¹
41. If a potential difference 1 volt is applied across an electron, the energy gained by it will be:
a. 9.1×10^{-19} joule b. 1eV
c. 1 Joule d. V/e Joule
42. Two bodies are projected at angles θ and $90-\theta$ to the horizontal with the same speed. The ratio of their times of flight is:
a. 1:1 b. $\tan\theta$
c. $1:\tan\theta$ d. $\tan^2\theta : 1$
43. A copper ball of radius r is moving with the uniform velocity v in the mustard oil and the dragging force acting on the ball is F. The dragging force on the copper ball of radius 2r with uniform velocity 2v in mustard oil is:
a. F b. 2F
- c. 4F d. 16F
44. The critical angle for a material medium to air is 30°, then the refractive index will be:
a. 1.0 b. 2.0 c. 1.5 d. 2.5
45. A current of 4.8A is flowing in a conductor. The numbers of electrons passing through any cross section per second is:
a. 3×10^{16} b. 3×10^{19}
c. 7.6×10^{12} d. 76.8×10^{19}
46. The dimensional formula of dimensional constant G is:
a. $[M^{-1}L^3T^{-2}]$ b. $[MLT^{-2}]$
c. $[M^{-1}LT^{-2}]$ d. $[ML^3T^{-2}]$
47. On four different days, the temperature is same. A man feels hot when the relative humidity is:
a. 50% b. 20%
c. 30% d. 99%
48. Three resistance each of 3 ohm are connected in parallel, the equivalent resistance is:
a. 9 ohm b. 1/3 ohm
c. 6 ohm d. 1 ohm
49. Which species of *Paramecium* contains only 3 nuclei?
a. *P. caudatum*
b. *P. polycarpum*
c. *P. multi micronucleatum*
d. *P. aurelia*
50. When centrum is concave on both sides, it is called:
a. Amphicoelous b. Procelous
c. Ophisthocoelous d. Acoelous
51. Two animal cells are joined together by:
a. rectin b. gum
c. plasmodesmata d. desmosome
52. In malaria, which causes chills and fever:
a. Hematocrit b. Haemozoin
c. Schuffers granule d. hematin
53. How many sperms and ova will be produced from 75 primary spermatocytes and 75 primary oocytes:
a. 100 sperms and 75 ova
b. 300 sperms and 100 ova
c. 300 sperms and 75 ova

- a. Own village Own product
- b. One village One product
- c. Our village Our product
- d. Own village Our product

77. Lime and Parkote are the local breeds of:

- a. Cattle b. Sheep
- c. Buffalo d. Goat

78. Agriculture and forestry university was established in ____ B.S. ?

- a. 2065 b. 2066
- c. 2064 d. 2067

79. Prime minister KP Oli has left for china for official visit on 20th march via:

- a. Nepal airlines
- b. China airlines

- c. Southern China airlines
- d. Himalayan airlines

80. Nepal won the gold medal in SAG Mens Football defeating India by:

- a. 2-1 b. 3-1
- c. 3-2 d. 2-0

Hints and Solutions

- 1. c 2.b 3.d 4.b
- 5. c passed
Simple past is used with simple past action.

With some words: $V = \frac{ds}{dt}$
yesterday, last

day/month/year, this morning, 1955,2001

- 6. a
Quite a few: A fairly large number
- 7. b
- 8. b
By the way: incidentally (used to introduce a new, less important topics)
- 9. c
The subject of quantity, amount, distance and time though in plural form always take singular verbs.
- 10. b
better
Good/well- better- best
- 11. c

Passive: obj + was/were + v3 + by + sub

- 12. a
In interrogative sentence, reporting verb is always changed into asked.

We use if/ whether in indirect speech if it is a yes/no question but we use wh-word, if it is wh- question
(Always remember wh word is followed by Subject in indirect speech)

- 13. a

P(A) =	$\frac{1}{4}$,	P(A) =	$\frac{3}{4}$
P(B) =	$\frac{1}{5}$,	P(B) =	$\frac{4}{5}$
P(C) =	$\frac{1}{6}$,	P(C) =	$\frac{5}{6}$

NOW , $P(\bar{A}) \cdot P(\bar{B}) \cdot P(\bar{C}) = \frac{3}{4} \cdot \frac{4}{5} \cdot \frac{5}{6} = \frac{1}{2}$

Hence, probability of problem that is solved = $1 - \frac{1}{2} = \frac{1}{2}$

- 14. a
Properties of determinant.
- 15. c

Before comparing the given eqⁿ of circle with $x^2 + y^2 + 2gx + 2fy + c = 0$, We must make coeff. Of x & y = 0 and use formula , radius (r) = $\sqrt{g^2 + f^2 - c}$ Center = (3, -1)

- 16. b
, a = $\frac{dv}{dt}$

Active: S+ v2 + object

$$V = 3t^2 - 12t - 4 \quad \& \quad a = 6t - 12$$

For zero acceleration, a vanishes i.e $6t - 12$

$$= 0$$

$$t = 2$$

17. a

Properties of absolute value;

$$|a + b| \geq |a| + |b|$$

$$|ab| = |a||b|$$

$$|a| \geq 0 \text{ non negativity}$$

18. a

Hit and trial: put the value given in option at x and find the answer

19. b

Idempotent matrix, $A^2 = A$

Involuntary matrix, $A^2 = I$

Orthogonal, $A^T A = I$ Or $A A^T =$

I

Nilpotent, $A^n = 0$

20. c

$$\lim_{n \rightarrow \infty} (1 + \frac{1}{n})^n = e$$

Taking (3) common then

$$\lim_{n \rightarrow \infty} \left\{ \frac{1 - x}{1 + x} \right\}^{\frac{-1}{x}} = e^{-3}$$

21. b

Here, $s_n = 2n^2 + 4n$ and $t_2 = s_2 - t_1 = 16 - 6 = 10$

22. a

Straight line $y = mx + c$ will be tangent to the circle $x^2 + y^2 = a^2$ ($a = \text{radius}$), if $a^2 =$

$$\frac{c^2}{1 + m^2}$$

23. b

24. d

Put, $y = 1 - \sin\theta$ then $\cos\theta d\theta = -dy$

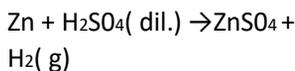
$$\int_0^x \frac{1 - dy}{\sqrt{y}} = -2\sqrt{y} = -2\sqrt{1 - \sin\theta} = -2(0 - 1) = 2$$

25. d

Value of equilibrium constant does not depend upon the concentration of reactants.

37. a

26. b



Lab preparation of H_2

27. c

For H_2SO_4 ,
Molarity = 0.005M
Normality = 0.01N
 $\text{pH} = -\log[\text{N}]$
 $= -\log[0.01] = 2$

28. a

Alkane = $\text{C}_n\text{H}_{2n+2}$
Alkene = C_nH_{2n}
Alkyne = $\text{C}_n\text{H}_{2n-2}$

29. b

33. b

In dry cell depolarizer is Manganese Dioxide.

34. a

Homologous series contains same

functional group, same chemical properties but different physical properties and differ

by molecular weight of 14 a.m.u. and CH₂ group.

35. a

Purine: Adenine

Nucleotide: AMP

Nucleoside:

Adenosine

36. b

Electron affinity \rightarrow decreases from top to bottom in a group. Electron affinity of fluorine is less than chlorine though it is higher than chlorine in periodic table due to very small atomic size, some energy is utilized in

overcoming the force of repulsion among electrons, resulting less value of EA of fluorine.

30. b

31. a

Electronegativity Order: $\text{Sp} > \text{Sp}^2 > \text{Sp}^3$

32. c

Cellulose is the polymer of β -D glucose
Starch is a polymer of α -D glucose

$$\text{Velocity} = dx/dt = d(2+5t-6t^2)/dt = 0+5-12*6*t$$

=5 (putting t = 0 for initial velocity)

38. d

Using the equation, $E \propto T^4$

39. d

$$\Delta x = \lambda/2\pi * \phi = \lambda/6$$

40. a

B

\propto

l

41. b

$$W = qv = 1eV$$

42. b

$$T = 2u \sin \theta / g$$

Now, $T_1/T_2 =$

$$\sin \theta / \sin(90-\theta) =$$

$$\sin \theta / \cos \theta = \tan \theta$$

43. c

$$F = 6\pi\eta r v$$

$$F' = 6\pi\eta(2r)(2v) = 4F$$

44. b

- $\mu = 1/\sin C$
 $= 1/0.5 = 2$
45. b
 1A = 6.25×10^{18} electrons per second
 4.8A = 3×10^{19} electrons per second
46. a
47. d
 a man feels hottest when the relative humidity is highest
48. d
 $R = n/R = 1 \text{ ohm}$
49. d
P. aurelia
 Autogamy is modified form of self fertilization commonly occurs in *P. aurelia*
 #Cytogamy is seen in *P. caudatum*.
 # Hemixis and endomixis is also commonly seen in *P. aurelia*
50. a
51. d
 Plasmodesmata is the passage between the cells
52. b
 Haemoglobin
 #Hematin-Accumulates haemozoin
 #Globin-digested by plasmodium
 #Release of Haemozoin into blood causes fever.
53. c
 One primary spermatocytes = 4 sperm cells
 One primary oocytes = 1 ovum
54. d
 Chimpanzee is the closest relative to Human.
55. c
 Duration between the initial sporozoite infection and the first appearance of the symptoms in blood is called incubation period.
56. d
 RQ is the ratio = $\text{CO}_2 \text{ eliminated} / \text{O}_2 \text{ consumed}$
 #Carbohydrates = 1
 #Fats = less than 1
 #Glucose = more than 1
57. c
 Protozoans
 are- # Amoeba
 # Plasmodium
 # paramecium
 #
 Trypanosoma
 # Entamoeba
 #
 Euglena
 # Giardia
 # Lesmania
58. b
59. b
 Leptotene- broquet stage
 Zygotene- Synapsis
 Pachytene- Crossing over
 Diplotene- Chiasma formation
 Diakinesis- Terminalization
60. c
61. d
 Oncology = tumor,
 Ornithology = birds
 62. b
 photorespiration is wasteful reaction occurs after photosynthesis, conversion of rubisco into RuBp takes place
63. c
 coralloid roots are found in cycas, root keeps symbiotic relationship with Cyanobacteria
64. a
 it is the process of development of 2n gametophyte, without meiosis and spores, in contrast apogamy is the development of 1n sporophyte without gametes and syngamy from vegetative cells of the gametophyte
65. b
 in mitotic division 2 cells will form from one division and each formed cell again divides altogether 5 times and produce 32 cells
66. a
 $\text{C}_{55}\text{H}_{72}\text{O}_5\text{N}_4\text{Mg}$ is the molecular formula of chlorophyll -a
67. d
68. b

Acetyl-coA is also called the link between glycolysis and kreb's cycle

69. c

Wheat is commonly hexaploid it contains 42 chromosomes

70. d 71. c 72.c 73.b 74.c

75. d 76.b 77.c 78d. **79.d** 80. a