

Sample Questions

1. An atom with an orbital notation of $1s^2 2s^2 2p^6 3s^2 3p^4$ will probably exhibit which oxidation state?
 - (a) +2
 - (b) -2
 - (c) +3
 - (d) -3
 - (e) +5

2. A man has 53 socks in his drawer: 21 identical blue, 15 identical black and 17 identical red. The lights are fused and he is completely in the dark. How many socks must he take out to make 100 per cent certain he has a pair of black socks?
 - (a) 15
 - (b) 23
 - (c) 30
 - (d) 40

3. aplomb, dodge, graph, jerk ?
What comes next?
 - (a) laugh
 - (b) maroon
 - (c) link
 - (d) nickel
 - (e) midnight

4. Chanderi saree is an example of
 - (a) Geographical indication
 - (b) Patent
 - (c) Copyright
 - (d) All the above

5. The energy required to break a covalent bond in a semiconductor
 - (a) Is equal to 1 eV
 - (b) Is equal to the width of the forbidden gap
 - (c) Is greater in germanium than in silicon
 - (d) Is the same in germanium as in silicon

6. In the p-n-p transistor, electrons flow
 - (a) Into the transistor at the emitter and base leads
 - (b) Out of the transistor at the emitter and base leads
 - (c) Into the transistor at the collector and base leads

- (d) Out of the transistor at the collector and base leads
7. The sugar unit present in DNA is derived from
- (a) glucose
 - (b) sucrose
 - (c) fructose
 - (d) ribose
8. A solenoid with a nickel core has 1000 turns on 0.5 m. The cross-sectional area of turn is 50 cm^2 . What is the magnetic field energy when a current 10 A passes through it ? Given permeability of nickel is 200.
- (a) 0.13 Joule
 - (b) 0.26 Joule
 - (c) 0.52 Joule
 - (d) 1.04 Joule
9. A public key encryption system
- (a) allows anyone to decode the transmission
 - (b) allows only the correct sender to decode the data
 - (c) allows only the correct receiver to decode the data
 - (d) does not encode the data before transmitting it
 - (e) None of the above
10. Trojan-Horse programs
- (a) are legitimate programs that allow unauthorized access
 - (b) do not usually work
 - (c) are hidden programs that do not show up on the system
 - (d) usually are immediately discovered
 - (e) None of the above
11. Conversion of binary number 1100011_2 to its decimal number is
- (a) 29_{10}
 - (b) 97_{10}
 - (c) 99_{10}
 - (d) 93_{10}
12. Two transparent media F and G are separated by a plane boundary. The speed of light in medium F is $2.0 \times 10^8 \text{ m/sec}$ and in medium G is $2.5 \times 10^8 \text{ m/sec}$. The critical angle for which a ray of light from F to G is totally internally reflected is
- (a) $\sin^{-1} (1/2)$

- (b) $\sin^{-1} (2/3)$
- (c) $\sin^{-1} (2/45)$
- (d) $\sin^{-1} (4/5)$

13. If the circle and square have the same area, then magnetizing force at the center of the coil as a result of current flowing through the coil will be in the ratio

- (a) 1
- (b) $\sqrt{\pi}$
- (c) $\sqrt{\pi/16}$
- (d) $\sqrt{\pi/32}$

14. When a man is standing in a lift and the lift is ascending with an upward acceleration f , then the man will appear to be heavier by

- (a) $(f + g)$ of his actual weight
- (b) $(f - g)$ of his actual weight
- (c) $(f \times g)$ of his actual weight
- (d) $(f \div g)$ of his actual weight

15. A 30meter wide canal is flowing at the rate of 20 m/min. A boy can swim at the rate of 25 m/min in still water. The time taken by him to cross the canal perpendicular to the flow is

- (a) 2.5 min
- (b) 2.0 min
- (c) 1.5 min
- (d) 1.0 min

16. Which of the following is an example of a deceptive trademark?

- (a) An image that does not accurately depict the product
- (b) A label that includes the name of the region when the product is not really from that region (i.e. Bordeaux)
- (c) A name that describes the product
- (d) None of the above

17. An element used in semiconductors whose atoms have three valence electrons is

- (a) Germanium
- (b) A donor
- (c) An acceptor
- (d) Silicon

18. The duration of protection for a patent specified in the Indian Patents Act is :

- (a) 25 years
- (b) 20 years
- (c) 15 years

- (d) 17 years
19. Amount of information in a continuous signal is
(a) Zero (b) 2 bits
(c) 4 bits (d) Infinite
20. The south-west monsoons end in India in
(a) December
(b) October
(c) November
(d) July
21. The drug most widely tried against AIDS virus is
(a) Zidovudine (azidothymidine)
(b) Miconazole
(c) Nonoxynol 9
(d) Virazole
22. If the radius of the earth were to shrink by one percent, its mass remaining the same, the value of 'g' on the earth's surface would
(a) increase by 0.5%
(b) increase by 2%
(c) decrease by 0.5%
(d) decrease by 2%
23. Which one of the following statements is NOT correct?
(a) The boiling point of an aqueous solution is higher than that of pure water
(b) Addition of solutes to a solution causes an increase in its water potential
(c) The vapour pressure of the water in a solution is lower than that of pure water
(d) When a solution is separated from water by a semipermeable membrane, water movement can be prevented by applying pressure to the solution
24. The virus that infects bacteria is
(a) arbovirus
(b) viraemia
(c) bacteriophage
(d) baclofen
25. Rectifiers are used to convert
(a) DC to AC
(b) AC to DC
(c) high voltage to low voltage
(d) low voltage to high voltage
26. A zener diode

- (a) has a high voltage characteristic
 - (b) has a sharp breakdown at low reverse voltage
 - (c) is useful as controlled rectifier
 - (d) has a negative resistance
- 27.** Montreal protocol is related to
- (a) Ozone depletion
 - (b) Nuclear weapons
 - (c) Landmines
 - (d) Sea-bed
- 28.** Lysine is an essential amino acid for man and therefore, has to be essential component of human diet. The highest content of this amino acid is found in:
- (a) Wheat
 - (b) Rye
 - (c) Oat
 - (d) Barley
- 29.** “Metastasis” is the process by which
- (a) cells divide rapidly under the influence of drugs
 - (b) cancer cells spread through the blood or lymphatic system to other sites or organs
 - (c) the chromosomes in cell nuclei are attached to the spindle before moving to the anaphase poles
 - (d) cancer cells are successfully inhibited to divide any further
- 30.** Two wires have their lengths, diameter and resistivities, all in the ratio of 1:2. If the resistance of the thinner wire is 10 ohms, the resistance of the thicker wire is
- (a) 5 ohms
 - (b) 10 ohms
 - (c) 20 ohms
 - (d) 40 ohms
- 31.** A city has a population of 3,00,000 out of which 1,80,000 are males, 50% of the populations is literate. If 70% of the males are literate, the number of literate females is
- (a) 24,000
 - (b) 30,000
 - (c) 54,000
 - (d) 60,000
- 32.** The cellular and molecular control of programmed cell death is known as
- (a) Apoptosis
 - (b) Ageing
 - (c) Degeneration
 - (d) Necrosis

33. In a certain code, MARCH is written as OCTEJ, how is RETURN written in that code?
- (a) TFUVSM
 - (b) QGSTQM
 - (c) TGVWTP
 - (d) TGRVSO
34. Taxonomy is a science dealing with the
- (a) classification of all living organisms
 - (b) classification of plants
 - (c) identification, nomenclature, and classification of all living organisms
 - (d) structure and function of living organisms
35. People who live at high altitudes have rosy cheeks because
- (a) haemoglobin has an increased binding affinity for oxygen to become deep red in colour
 - (b) red cell concentration becomes considerably above the average in response to lowered oxygen pressure
 - (c) the rate of capillary circulation increases in the skin to make it look pinkish
 - (d) all of these
36. One fourth of the sum of the prime numbers, greater than 4 but less than 16, is the square of
- (a) 2
 - (b) 3
 - (c) 4
 - (d) 5
37. 30% of 20 plus 20% of 30 equals
- (a) 10% of 600
 - (b) 10% of 1,200
 - (c) 1% of 1,200
 - (d) 1% of 600
38. If BODMAS is coded as DQFOCU, then what would FORMULAE be coded as?
- (a) HQTOWNCG
 - (b) ENQLTKZD
 - (c) GPSNVMBF
 - (d) HQTOWKAD

39. Statements:

- I All neighbours live in harmony
- II Some neighbours live in harmony
- III No neighbours live in harmony
- IV Some neighbours do not live in harmony.

Choose any two statements from the above, which cannot be true together but can be false simultaneously

- (a) I and III
- (b) II and IV
- (c) II and III
- (d) III and IV

40. A micron is equivalent to

- (a) 0.01 mm
- (b) 0.01 m
- (c) 0.001 mm
- (d) 0.0001 mm

41. An electric heater made up of nichrome wire is connected to A.C. mains and generates some heat. Keeping the A.C. mains voltage constant, it is desired to double the quantity of heat. This is possible if

- (a) The radius of nichrome wire is doubled
- (b) The length of nichrome wire is doubled
- (c) Both the length and the radius of the nichrome wire are halved
- (d) Both the length and the radius of the nichrome wire are doubled

42. Polymerase Chain Reaction (PCR) is a technique to make copies of

- (a) DNA using living cells
- (b) DNA without using living cells
- (c) RNA using living cells
- (d) RNA without using living cells

Q 43-46 Read the passage below and select the right answers

The heart is not just a mass of pumping muscle, but a hotbed of electrical activity, as independent on a stable supply of power as a computer chip is. When the ventricles, which produce the heart's pumping action, do not get the right signals and beat inefficiently, oxygen-rich blood does not reach the vital organs. In a heart with irregular heart beats – or arrhythmia – one short circuit can trigger another speeding the organ into tachycardia – or 'racing heart'. In most severe cases, blacking out – caused by ventricular fibrillation, during which the heart quivers instead of beats, shock and sudden cardiac death follow.

43. From the passage, it is clear that the heart is

- (a) a powerful muscle capable of producing electricity
 - (b) a supplier of power to the muscles
 - (c) an organ working on the principle of a computer
 - (d) a pumping muscle requiring continuous supply of power
- 44.** Oxygen-rich blood does not reach the vital organs when
- (a) the ventricles beat irregularly
 - (b) the ventricles fail to give right signals
 - (c) arrhythmia results
 - (d) the heart receives inadequate power
- 45.** Ventricular fibrillation causes
- (a) heart quivers instead of beats
 - (b) black outs, shock and death
 - (c) tachycardia or “racing heart”
 - (d) arrhythmia and short circuits
- 46.** It can be understood from the passage that what supports the heart most is
- (a) heart beats
 - (b) blood circulation
 - (c) ventricles
 - (d) muscles surrounding it
- 47.** In a military code CAUTION is coded as UACITNO, How will you write MISUNDERSTAND?
- (a) SIMUNEDSRTAND
 - (b) SIMNUEDSRATDN
 - (c) SMIUNDERSTAND
 - (d) None of these above
- 48.** The probability of a head and a tail of tossing four coins simultaneously is
- (a) $1/8$
 - (b) $1/16$
 - (c) $1/4$
 - (d) $1/64$
- 49.** Which of the following is not an operating system?
- (a) DOS
 - (b) UNIX
 - (c) Macintosh OS
 - (d) Java

50. Lemon grass is known to have insecticidal properties. Extract of the grass contains chemicals other than citral. Citral acts against fungus and other pests. Some one finds that extract of lemon grass is effective against fungus as well. Would you conclude:
- (a) the discovery is new
 - (b) lemon grass has something else which is effective against fungus
 - (c) citral is responsible for the fungicide effect of lemon grass
 - (d) information is not adequate to conclude (a) or (b) or (c)
51. Four bonds of CCl_4 are directed in space at an angle of
- (a) 90°
 - (b) 120°
 - (c) $109^\circ 28'$
 - (d) $128^\circ 09'$
52. The Heisenberg's uncertainly principle can be applied to
- (a) a flying concord
 - (b) a moving cricket ball
 - (c) an electron
 - (d) a proton

Question 53-54 Directions:

The following items consist of two statements, one labeled as Assertion (A) and the other labeled as Reason (R). You are to examine these two statements carefully and decide if the Assertion A and Reason (R) are individually true and if so whether the Reason is a correct explanation of the Assertion. Select your answer to these items using the codes given below and mark your answer sheet accordingly.

Codes

- (a) Both A and R are true and R is the correct explanation of A
 - (b) Both A and R are true but R is NOT a correct explanation of A
 - (c) A is true but R is false
 - (d) A is false but R is true
53. **A:** Electro negativity decreases down the group in the periodic table
R: Atomic size increases down the group in the periodic table
- (a) Both A and R are true and R is the correct explanation of A
 - (b) Both A and R are true but R is NOT a correct explanation of A
 - (c) A is true but R is false
 - (d) A is false but R is true

54. **A:** Isomers are same compounds with different molecular formula
R: Isomers have different arrangement of their constituent atoms in the space
- (a) Both A and R are true and R is the correct explanation of A
 - (b) Both A and R are true but R is NOT a correct explanation of A
 - (c) A is true but R is false
 - (d) A is false but R is true

55. Examine the following statements carefully

- i) All young persons are energetic
- ii) Some young persons are frank
- iii) Some frank persons are rude
- iv) All rude persons are social isolates

From the given what follows as the most logical outcome?

- (a) All frank persons are social isolates
- (b) All young persons are social isolates
- (c) Some non-energetic young persons are social isolates
- (d) Some frank young persons are social isolates