Question Booklet Series : A ***Question Booklet Sr. No.*** 200352

PU-CET (BDS) – 2014

Paper – II: Chemistry

Important: *Please consult your Admit Card/Roll No. slip before filling your Roll Number on the Test Booklet and Answer Sheet.*

Roll No. *In Figure* *In Words*

O.M.R. Answer Sheet Serial No.

Signature of the Candidate _____

Time: 70 minutes **Number of Questions: 60** **Maximum Marks :120**

INSTRUCTIONS

1. Write your roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Code No. of Question Booklet on the OMR answer Sheet. Darken the corresponding bubbles with **Black Ball Point/Black Gel Pen**.
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. Please check that this Question Booklet contains 60 questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
5. Each question has four alternative answer (A, B, C, D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point/Black Gel Pen.** Each question carries 2 marks. **For every wrong answer, 25% i.e. ¼ mark allotted to the question will be deducted.**
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13. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
14. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculators is not allowed.**

1) The element that displays the highest ability to form Pπ-Pπ multiple bonds to itself is
   A) N
   B) P
   C) As
   D) Br

2) Depending upon the element, electron gain enthalpy can be
   A) endothermic only
   B) exothermic only
   C) endothermic or exothermic
   D) solvation dependent

3) The weight of 1 mole of H_2O, H_2O_2 and H_2
   A) will be different
   B) will be same
   C) cannot be determined
   D) will be Avogadro's constant

4) Atomic orbitals are precisely distinguished by what are known as
   A) spin-orbit interactions
   B) valence electrons
   C) nodal surfaces
   D) quantum numbers

5) The occurrence of photoelectric effect depends upon
   A) intensity of the light alone
   B) frequency of the light alone
   C) intensity of the light and type of the metal used
   D) frequency of the light and type of the metal used

6) Choose the molecular orbital with highest energy
   A) σ^*2P_z
   B) $\pi 2P_y$
   C) σ^*2S
   D) σ 1S

7) For a given element, the covalent radius will be
   A) one half of van der Waals radius
   B) equal to van der Waals radius
   C) greater than van der Waals radius
   D) smaller than van der Waals radius

8) In a poly atomic molecule, the dipole moment is
   A) undefined
   B) a negative quantity
   C) the vector sum of the dipole moments of various bonds
   D) always zero

9) Given below is the reaction that occurs in a lead-acid battery

$$Pb + PbO_2 + 2H_2SO_4 \xrightarrow{\text{discharge}} 2PbSO_4 + 2H_2O$$

   Which is the species that is oxidized during this battery discharge?
   A) PbO_2
   B) Pb
   C) SO_4^{2-}
   D) H_2O

10) Select the correct ionic species that is present in the aqueous solution of iodine containing KI

   A) I_3^-
   B) I_2^-
   C) I_n^-, n= 4,6 or 8
   D) I^+ and I^-

11) The main difference in the chemical properties of isotopes of hydrogen is in their
   A) reaction with metals
   B) rate of reactions
   C) redox behavior
   D) hydride formation

12) Upon strong heating, alkaline-earth metal carbonates produce
   A) metal oxide and metal hydroxide
   B) carbon dioxide and metal oxide
   C) bicarbonate and metal hydroxide
   D) carbon dioxide and water

13) In the network structure of SiO_2, the smallest ring size and the geometry of bonding around silicon atoms are
   A) six and tetrahedral respectively
   B) infinite and tetrahedral respectively
   C) eight and tetrahedral respectively
   D) eight and octahedral respectively

14) In a ferrimagnetic substance, magnetic moments of the domains are aligned in parallel and antiparallel directions in
A) unequal amounts
B) equal amounts
C) 2:1 ratio always
D) 1:2 ratio always

15) The unit cell of an ionic compound has 'P' ions at the corners of the cube and 'Q' ions at the centers of the faces of the cube. The empirical formula of the compound would be
A) PQ_3
B) PQ
C) P_2Q
D) P_3Q

16) In metallurgy, if the difference of the two electrode potential (E°) values of the redox couple corresponds to a positive E°, then
A) melting point of both the metals will be reduced
B) both the metals will come out of the solution
C) more reactive metal will come out of the solution
D) less reactive metal will come out of the solution

17) The reaction of PCl_5 with finely divided Ag produces colorless oily liquid which reacts with water to produce
A) P_2O_5
B) PH_3
C) HCl
D) AgCl

18) Heating of MnO_2 with concentrated HCl produced a gas which upon reaction with H_2S produced another gas which readily dissolved in water. To this solution, powdered Na_2CO_3 was added to produce a colorless gas which is
A) SO_2
B) CO_2
C) CO
D) O_2

19) Identify the electronic configuration which will have the lowest magnetic moment
A) d^2
B) d^5
C) d^7
D) d^6

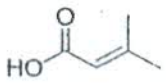
20) The correct shape of $[NiCl_4]^{2-}$ and $Ni(CO)_4$ is
A) tetrahedral and square planar
B) square planar and tetrahedral
C) octahedral and tetrahedral
D) tetrahedral for both

21. In Kjeldahl's method the nitrogen present in organic compound is converted to:

(A) NO_2 (B) $(NH_4)_2SO_4$

(C) HNO_3 (D) NH_3

22. The IUPAC name for the formula given below is:



(A) 2-Methyl but-2-enoic acid (B) 3-Methyl but-3-enoic acid

(C) 3-Methyl but-2-enoic acid (D) 2-Methyl but-3-enoic acid

23. Benzene reacts with HNO_3 / H_2SO_4 to form nitrobenzene. This is an example of:

(A) Electrophilic addition (B) Nucleophilic addition

(C) Nucleophilic substitution (D) Electrophilic substitution

24. Identify the least stable carbocation from the list given below:

$(CH_3)_3C^+$, $(CH_3)_2CH^+$, $CH_3CH_2^+$ and $^+CH_2Cl$

(A) $(CH_3)_2CH^+$ (B) $(CH_3)_3C^+$

(C) $^+CH_2Cl$ (D) $CH_3CH_2^+$

25. The major product formed in the photochemical chlorination of propane is derived from:

(A) $CH_3\dot{C}HCH_3$ (B) $CH_3\overset{+}{C}HCH_3$

(C) $CH_3CH_2\dot{C}H_2$ (D) $CH_3CH_2\bar{C}H_2$

26. Which of following alkene reacts with HBr in the presence of peroxide to give *anti*-Marovinkov's product?

(A) 1-Butene (B) 2-Butene

(C) 2, 3-Dimethyl-2-butene (D) 3-Hexene

27. A hydrocarbon C_4H_6 forms a white precipitate with ammonical silver nitrate solution. It reacts with dil.H_2SO_4 / $HgSO_4$ to form 2-butanone. The hydrocarbon could be:

(A) 1-Butene (B) 1-Butyne

(C) 2-Butyne (D) 2-Butene

28. Benzene reacts with propene in presence of conc. H_2SO_4 to give:

(A) *n* - Propylbenzene (B) Ethyl benzene

(C) *iso* - Propyl benzene (D) Styrene

29. The reaction of toluene with chlorine in presence of ferric chloride gives:

(A) *m*- Chlorotoluene (B) Benzyl chloride

(C) *o* and *p*- Chloro toluene (D) Benzal chloride

30. Which of the following gas is responsible for depletion of ozone layer?

(A) Nitrogen (B) Methane

(C) Carbon dioxide (D) Chlorofluorocarbons

31. Which of the following reagent is not suitable for synthesis of alkyl halide from alcohol?

(A) $SOCl_2$ (B) PCl_3

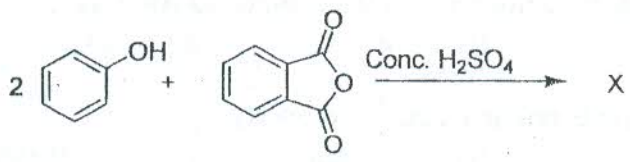
(C) Conc. HCl / $ZnCl_2$ (D) Aq. NaCl

32. Hydroboration- oxidation of 2-methylpropene gives:

(A) 2 -Methyl - 2 - propanol (B) 1,2 -Propanediol

(C) 2 -Methyl - 1 - propanol (D) 1,3 – Propanediol

33. In the following reaction sequence the compound X is:



(A) Bakelite (B) Salicylic acid

(C) Phenolphthalein (D) Resorcinol

34. Which of the carbonyl compound undergoes aldol condensation?

(A) Acetone (B) Bezaldehyde

(C) Benzophenone (D) Formaldehyde

35. The most suitable reagent to distinguish between acetic acid and formic acid is:

(A) Br_2 / CCl_4 (B) alkaline $KMnO_4$

(C) $SOCl_2$ (D) Tollen's reagent

36. Which of the following amine will dissolve in aqueous NaOH after reaction with Hinsberg reagent?

(A) $(CH_3CH_2)_2NH$ (B) $CH_3CH_2NH_2$

(C) $(CH_3CH_2)_3N$ (D) $(CH_3)_2NH$

37. Benzene diazonium chloride on reaction with sodium salt of sulphanilic acid to gi
A) Benzene sulphonic acid B) Methyl orange
C) Aniline D) *p*-Aamino azobenzene

38. Which of the following does not give silver mirror with Tollen's reagent
A) Glucose B) Fructose C) Sucrose D) Ribose

39. The monomer of Nylon-6 is
A) Adipic acid B) 1,3-Butadiene
C) Terphtahlic acid D) Caprolactam

40. The drugs used to bring down body temperature during fever are called
A) Analgesics B) Antiseptics
C) Antipyretics D) Antibacterials

41. The number of atoms present per unit cell in a primitive unit cell
A) 6 B) 12 C) 1 D) 8

42. The following is not a colligative property of a solution of non volatile solute
A) size of the solvent molecules B) lowering in vapour pressure
C) elevation in boiling point D) depression in freezing point

43. The Van't Hoff factor " i " of the compound $AlCl_3$ is
A) 1 B) 4 C) 3 D) 2

44. The following is not an extensive property
A) mass B) volume C) enthalpy D) surface tensio

45. The mathematical relationship between internal energy, heat and work done by the system is
A) $\Delta E = q$ B) $\Delta E = q + W$
C) $\Delta E = q - W$ D) $\Delta E = W$

46. A solution if electrolyte "C" freezes at -0.172^0C. The boiling point of the aqueous solution of "C" at 1 atmosphere (if K_f is 1.86 and K_b is 0.51) will be
A) 100.047^0 C B) 100^0C
C) 0.047^0C D) 0^0C

47. The unit of molar conductance is
A) ohm^{-1} cm B) ohm^{-1} mol^{-1}
C) ohm^{-1} cm^2 D) ohm^{-1} cm^2 mol^{-1}

48. The magnitude of the electric charge carried by one electron on the basis of Faraday constant is
A) 1.6×10^{-19} V B) 6.0×10^{23}
C) 1.6×10^{-19} C D) 96500 C

49. The energy released when a current of 2.0 A passes through a conductor for 100 S under a potential of 120 U is

A) 24 kJ B) 2 kJ C) 100 kJ D) 120 kJ

50. The order of a reaction when the reaction rate is independent of all the concentration of all the reactants

A) 1 B) 0 C) 2 D) 3

51. The half life of a first order reaction is 300 S. its decay constant is

A) $0.1386\ m^{-1}$ B) $0.033\ s^{-1}$
C) $300\ m^{-1}$ D) $0.1386\ s^{-1}$

52. The difference in pressure between top and bottom of a vessel having 76 cm depth when filled with matter having density of $14.09/cm^3$ is around

A) 76 Pa B) 104000 Pa
C) 1400 Pa D) 14 Pa

53. A mixture of gases at 760 Pa contains 60 percent Argon, 30 percent Xenon and 10 percent Oxygen. The partial pressure of Argon is

A) 760 Pa B) 76 Pa C) 456 Pa D) 228 Pa

54. The oxidation state of Silicon in H_2SiO_3 is

A) +2 B) +1 C) +4 D) +3

55. The number of moles of respective reactants and products required for balancing the following reaction is as follows:-

$$FeS_2 + O_2 \longrightarrow Fe_2O_3 + SO_2$$

A) 4, 11, 2, 8 B) 2, 2, 4, 6
C) 4, 6, 2, 8 D) 3, 2, 6, 4

56. A quantity of PCl_5 was heated in a 10L vessel at 200^0C

$$PCl_5\ (g) \longrightarrow PCl_3\ (g) + Cl_2\ (g)$$

A+ equilibrium the vessel contains 0.2 mol PCl_5, 0.4 mol PCl_3 and 0.2 mol Cl_2. The equilibrium constant is

A) 0.4 B) 0.04 C) 0.2 D) 0.02

57. A 120 ml aqueous solution of $AgNO_3$ having strength of 0.330 g $AgNO_3$ per cm^3 can be prepared by taking the following amount of $AgNO_3$

A) 1.8g B) 120 g C) 0.030g D) 3.6g

58. The number of electrons that can be accommodated on all the 5 S orbitals is

A) 6 B) 2 C) 10 D) 14

59. Paul's exclusion principle is violated in the following case

A) $1\ S^3$ B) $1\ S^2$ C) $2S^2\ 2P^4$ D) $2S^1$

60. The pOH of solution having $[H^+]$ concentration as 10^{-5} is

A) 9 B) 5 C) 7 D) 1

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1. A body is moving in 3 dimensional space. The gradient of distance – time graph (distance on y- axis and time on x- axis) tells us

A) Velocity
B) Displacement
C) Acceleration
D) Speed

2. A car moving on a horizontal road may be thrown off the road while taking a turn, by

A) Gravitational force
B) Due to lack of proper centripetal force
C) Due to lack of frictional force between tyres and the ground
D) Due to reaction of the ground

3. A wire of length l and diameter d experiences increase in length δl when stretched with a force F. Another wire of the same material and with length 2l and diameter 2d is stretched with a force 2F. The change in length is

A) δl/ 2
B) δl
C) 2 δl
D) 4 δl

4. If radius of earth increases by 10% without any change in its mass, the acceleration due to gravity (g) on the surface of earth, would

A) Increase by 10%
B) Decrease by 10%
C) Increase by 21%
D) Decrease by 21%

5. For an ideal gas in equilibrium, the following quantity is zero.

A) Average speed
B) Average kinetic energy
C) Total momentum
D) Density

6. In a simple harmonic motion, angular velocity and amplitude are denoted by ω and a respectively. The ratio of potential to kinetic energy is given by the following expression in terms of displacement, x.

A) $\frac{x^2}{a^2+x^2}$
B) $\frac{x^2}{a^2-x^2}$
C) $\frac{a^2+x^2}{a^2-x^2}$
D) $\frac{a^2-x^2}{x^2}$

7. A simple pendulum has time period T. It is taken inside a lift moving up with uniform acceleration g/3. Now its time period will be

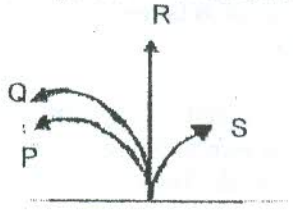
A) $\sqrt{2}T$
B) $2T/\sqrt{3}$
C) $\sqrt{3}T/2$
D) $\sqrt{3}T/2$

8. Three closed vessels A, B and C are at the same temperature T and contain gases which obey the Maxwellian distribution law of velocities. Vessel A contains only O_2, B only N_2 and C a mixture of equal quantities of $N_2$and O_2. If the average speed of the O_2 molecules in vessel A is V_1, that of N_2 molecules in vessel B is V_2, the average speed of the O_2 molecules in vessel C is

A) $(V_1+V_2)/2$
B) V_1
C) $(V_1V_2)^{1/2}$
D) $(3kT/M)^{1/2}$

9. A neutron, a proton, an electron and an α -particle enter a region of uniform magnetic field with the same velocities. The magnetic field is perpendicular and directed into the plane of the paper. The tracks of the particles are labelled in the figure. The electron follows the track

A) S
B) R
C) Q
D) P

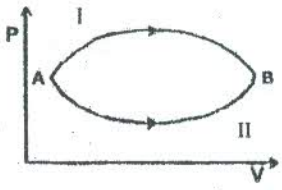


10. One third of a chain, of mass M and length L is hanging freely from the edge of a table with a smooth top. Work done to pull the whole chain back on the table is

A) MgL/36
B) MgL/18
C) MgL/9
D) MgL/3

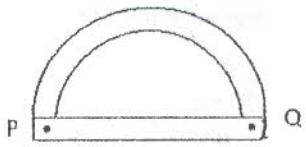
11. A system goes from A to B via two processes I and II as shown in the figure. If ΔU_1 and ΔU_2 are the changes in internal energies in the processes I and II respectively, then

A) Relation betweenΔU_1 andΔU_2 cannot be determined.
B) $\Delta U_1 = \Delta U_2$
C) $\Delta U_1 > \Delta U_2$
D) $\Delta U_1 < \Delta U_2$



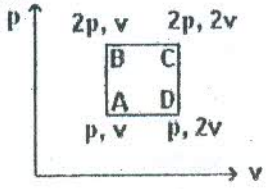
12. Two rods (one straight and the other semicircular) of the same material and same cross sectional area are joined as shown in the figure. The points P and Q are maintained at different temperatures. The ratio of the heat transferred through the semicircular rod to the heat transferred through the straight rod in a given time is

A) 2: π
B) 1: 2
C) π: 2
D) 3: 2



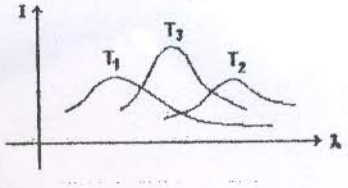
13. An ideal monatomic gas is taken round the cycle ABCDA as shown in the p – v diagram. The work done during the cycle is

A) pv
B) 2pv
C) pv/2
D) zero



14. The plots of intensity versus wavelength for three black bodies at temperatures T_1, $T_2$and T_3 respectively are as shown. Their temperatures are such that

A) $T_1 > T_2 > T_3$
B) $T_1 > T_3 > T_2$
C) $T_2 > T_3 > T_1$
D) $T_3 > T_2 > T_1$



15. A force $\vec{F} = (\hat{i} - 2\hat{j} + 4\hat{k})$ N is applied over a particle which displaces it from the origin to the point $\vec{r} = (\hat{i} - 2\hat{j} + 4\hat{k})$ m. Work done on the particle is

A) 13 J
B) 3 J
C) 7 J
D) 21 J

16. A truck and a car moving with the same kinetic energy are brought to rest by applying the same retarding force. Then

A) The truck will travel a longer distance before stopping.
B) The truck will take longer time to stop.
C) The car will travel a longer distance before stopping.
D) Both will travel the same distance before stopping.

17. A current I = 3 sin (ωt) amperes flows through a light bulb. The potential difference across the bulb is given by V = 4 cos (ωt) volt. Power dissipated in the bulb is

A) 12 W
B) 6 W
C) 3 W
D) Zero

18. Two point charges +q and –q Coulomb are kept at rest at the coordinates $x\hat{i}$ and $-x\hat{i}$ cm respectively. Another point charge +Q Coulomb is brought slowly from infinity to the point $\frac{x}{2}\hat{i}$ cm by an external agent. Work done (in Joules) is

A) $\frac{100}{3\pi\varepsilon_0 x}$ Qq

B) $\frac{30}{8\pi\varepsilon_0 x}$ Qq

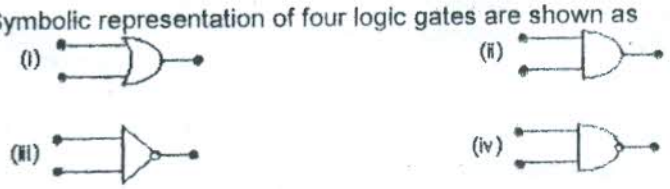
C) Zero

D) $\frac{1}{x}$ Qq

19. A sample of radioactive substance has 8000 radioactive nuclei to begin with. The decay product is not radioactive. At the end of the third day only 1000 of the radioactive nuclei remain. Half life of the radioactive nucleus is

A) 3days
B) 2 days
C) 1day
D) Uncertain.

20. Symbolic representation of four logic gates are shown as



Pick out which ones are for AND, NAND and NOT gates, respectively:

A) (ii), (iii) and (iv)
B) (iii), (ii) and (i)
C) (ii), (iv) and (iii)
D) (iii), (ii) and (iv)

21. The ionization energy of hydrogen atom in its ground state is 13.6 eV. The ionization energy of He^+ ion in its ground state is

A) 13.6 eV
B) 27.2 eV
C) 40.8 eV
D) 54.4 eV

22. The density of air at STP is 1.20409 kg/m^3. Round this off to three significant figures.

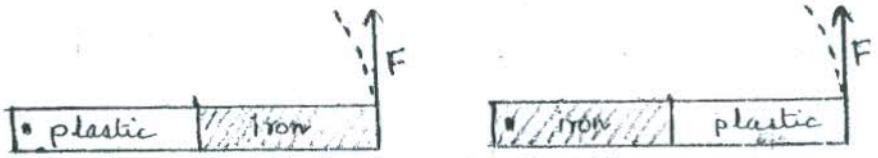
A) 1.204
B) 1.2041
C) 1.20
D) 1.2

23. A ball rolls on the ground (frictionless) towards the north-east direction with a constant speed of 2 m/s. Its displacement after 10 seconds will be (positive x axis is along east and y axis along north)

A) 20 m
B) 14.14 $(\hat{i} + \hat{j})$ m
C) 20 $(\hat{i} + \hat{j})$ m
D) 14.14 $(\hat{i} - \hat{j})$ m

24. A rod made of half plastic and half iron as shown in the figure, is pivoted at the plastic end and a force F is applied to the iron end resulting in angular accelerationα. It is then pivoted at the iron end and a force F is applied to the plastic end resulting in angular accelerationβ.

A) $\alpha < \beta$
B) $\alpha > \beta$
C) $\alpha = \beta$
D) There is insufficient information about magnitudes ofα and β.



25. A coin which has mass m lies on a stationary turntable at a distance r from its centre. Coefficient of friction between the coin and the turntable is μ. The turntable starts rotating with increasing angular velocity. The coin will start moving (slipping) with respect to the turntable when angular velocity reaches the value

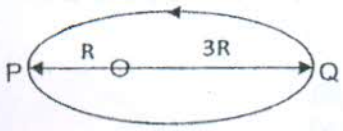
A) $\frac{mgr}{\mu}$
B) $\sqrt{\frac{gr}{\mu}}$
C) $\frac{mg\mu}{r}$
D) $\sqrt{\frac{g\mu}{r}}$

26. A hollow cylinder of mass M starts rolling down a smooth (frictionless) inclined plane. A cube of the same mass starts moving from the same height on the same plane at the same time. When they reach the bottom of the plane,

A) they have the same translational velocity
B) the cylinder has larger translational velocity
C) the cube has larger translational velocity
D) the cube has larger kinetic energy

27. A planet moves around the sun in an elliptical orbit as shown. When it is nearest to the sun, at point P, it is at a distance R from the sun. When it is furthest from the sun, at point Q, it is at a distance 3R from the sun. The velocities at these positions are V_P and V_Q respectively.

A) $V_P = V_Q$
B) $V_P = 3V_Q$
C) $V_P = V_Q/3$
D) $V_P = V_Q/2$

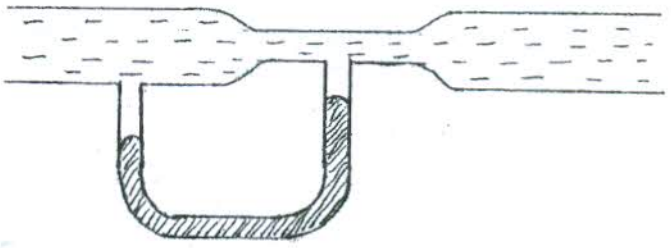


28. When an object moves faster through a fluid, the force of friction on it

A) Increases
B) Decreases
C) Remains same
D) becomes zero at a certain velocity

29. Water flows through the tube shown below. The areas of cross section of the wide and narrow portions of the tube are 5 cm^2 and 2 cm^2 respectively. The rate of flow of water through the tube is 50 cm^3/s. The difference of mercury levels in the U-tube is

A) 1.97 cm.
B) 1.79 cm.
C) 2.66 cm.
D) 3.5 cm.



(take $g = 9.8\ cm/s^2$ and relative density of mercury $= 13.6$)

30. A metal cube is placed in an empty vessel. When water is filled in the vessel so that the cube is completely immersed in water, the force on the bottom of the vessel in contact with the cube

A) Will increase
B) Will decrease
C) Will remain same
D) Will increase or decrease depending on relative areas of vessel and cube.

31. A capillary tube of radius r is dipped vertically in a liquid with density ρ and surface tension S. The height h of the liquid column raised in the capillary tube is

A) $\frac{S\cos\theta}{\rho g r}$

B) $\frac{S\sin\theta}{\rho g r}$

C) $\frac{2S}{\rho g r\cos\theta}$

D) $\frac{2S\cos\theta}{\rho g r}$

32. A wire loop of radius 3 cm is dipped in soap solution and taken out so that a soap film is formed. A loop of 2.68 cm long thread is gently placed on the film and the part inside this loop is pricked with a needle. The thread loop takes the shape of a circle. The surface tension of the soap solution is 0.030 N/m. Tension in the thread is

A) 3×10^{-3} N
B) 3×10^{-4} N
C) 4×10^{-3} N
D) 4×10^{-4} N

33. When water droplets merge to form a bigger drop

A) Energy is released
B) Energy is absorbed
C) Energy is neither released nor absorbed
D) Energy is released or absorbed depending on the temperature.

34. Two particles C and D have phase difference of π when a sine wave passes through the region.

A) D oscillates with half the frequency of C.
B) C and D move in opposite directions
C) C and D must be separated by half a wavelength.
D) The displacements of C and D have unequal magnitudes.

35. A tuning fork vibrating with a sonometer which has a 20 cm wire produces 5 beats per second. The beat frequency does not change if the length of the wire is changed to 21 cm. The frequency of the tuning fork must be

A) 200 Hz
B) 205 Hz
C) 210 Hz
D) 215 Hz

36. A biconvex lens is made of a material with refractive index, $\mu = 1.25$. It is immersed in water with $\mu = 1.33$. It now acts as

A) a convex lens
B) a concave lens
C) a slab
D) a prism

37. A child is using a thin convex lens of 10 cm focal length to examine the wing of a butterfly. How far from the wing should he hold the lens so that the magnified image is formed at a distance of 30 cm from the lens which is very close to her eye?

A) 5 cm
B) 7.5 cm
C) 10 cm
D) 15 cm

38. An astronomical telescope has an objective of focal length 200 cm and eyepiece e of focal length 4 cm. The telescope is focussed to see an object 10 km away, with the final image at infinity. The length of the tube is

A) 196 cm
B) 200 cm
C) 204 cm
D) 208 cm

39. Suppose the wave length λ and the double slit separation d in a Young's double slit experiment are such that the 6th dark fringe is obtained at point P on the screen. The path difference ($S_2P - S_1P$), where S_2 and $S_1$are the positions of the two slits, will be

A) $5\lambda/2$
B) 6λ
C) 3λ
D) $11\lambda/2$

40. Concerning the photoelectric effect, which of the following is <u>not</u> true?

A) For most metals, ultraviolet light is needed for the photoelectric effect to occur.
B) Because a faint light contains very little energy, it take a few minutes before electrons are emitted from the metal it is shining upon.
C) A bright light causes more electrons to be emitted than a faint light.
D) Higher frequency light emits electrons with higher kinetic energies

41. The wave theory of light and the quantum theory of light

A) are in direct contradiction to one another.
B) together show that X-rays really are an unknown (hence the "X") phenomenon.
C) complement each other.
D) are both necessary to explain the interference patterns of light.

42. Two capacitors C_1 and C_2 are charged to potential V_1 and V_2 respectively and then connected in parallel. The common potential is

A) $\dfrac{C_1V_1 + C_2V_2}{C_1 + C_2}$

B) $\dfrac{C_1V_2 + C_2V_1}{C_1 + C_2}$

C) $\dfrac{C_1V_2}{C_2} + \dfrac{C_2V_1}{C_1}$

D) $\dfrac{\sqrt{C_1V_1C_2V_2}}{C_1 + C_2}$

43. A TV tower is 80 m tall. The maximum distance upto which the signal transmitted can be received is (Radius of earth = 6400 km)

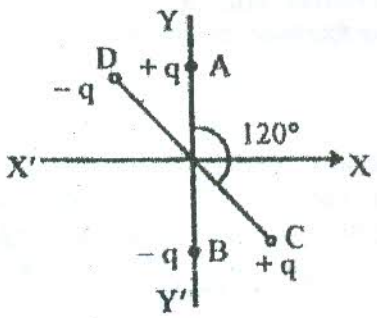
A) 22 km
B) 52 km
C) 82 km
D) 32 km

44. Two polaroids are set in crossed positions. A third polaroid is placed between the two making an angle □ with the pass axis of the first polaroid. In what orientation will the transmitted intensity be maximum?

A) $\theta = 0^0$
B) $\theta = 45^0$
C) $\theta = 90^0$
D) $\theta = 60^0$

45. Two small identical electrical dipoles AB and CD each of dipole moment p are kept at an angle of 120^0 as shown in the figure. The system is subjected to electric field E directed along x direction. The magnitude of resultant dipole moment and torque are

A) p, pE/2
B) p/2, pE
C) p, pE
D) 2p, 2pE



46. In a p – n junction,

A) New holes and conduction electrons are produced continuously throughout the material.
B) New holes and conduction electrons are continuously moving into the depletion region causing the *drift current*.
C) holes and conduction electrons recombine only in the depletion region.
D) holes and conduction electrons recombine only above a certain temperature.

47. Consider the following two statements about a linearly polarized plane electromagnetic wave in which electric and magnetic fields are given by
$E = E_0 \sin \omega(t - x/c)$ and $B = B_0 \sin \omega(t - x/c)$.

(i) The electric field is equal to the magnetic fields times c (velocity of light).
(ii) The electric energy and magnetic energy have equal average value.

A) (i) is true (ii) is false
B) (ii) is true (i) is false
C) Both (i) and (ii) are true
D) Both (i) and (ii) are false.

48. A series AC circuit has a reactance of 4Ω and resistance 3 Ω. The impedance of th circuit is

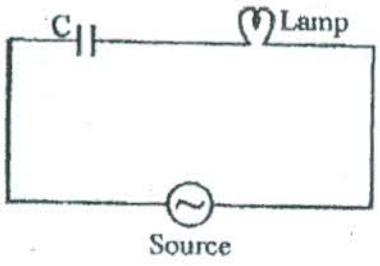
A) 7 Ω
B) √7 Ω
C) 5 Ω
D) √5 Ω

49. The resonance frequency of a circuit with a resistance R = 120 Ω, inductance L = 10 mH and capacitor C = 100 μF connected in series is close to

A) 100 Hz
B) 75 Hz
C) 50 Hz
D) 25 Hz

50. An electric lamp which has a coil of negligible inductance connected in series with capacitor and an AC source is glowing with a certain brightness. How does th brightness of the lamp change on reducing the capacitance?

A) will increase
B) decrease
C) will remain unaffected
D) may increase or decrease



51. A long solenoid S_1 with radius r_1 is placed coaxially inside another long solenoid S with radius r_2 . The number of turns per unit length are n_1 and n_2 respectivel Consider length l of each solenoid. Mutual inductance between them is

A) $\mu_0 n_1 n_2 \pi r_1^2 l$
B) $\mu_0 n_1 n_2 \pi r_2^2 l$
C) $\mu_0 n_1 n_2 \pi r_1 r_2 l$
D) $\mu_0 n_1 n_2 \pi r_2 l^2$

52. Magnetic field at the centre of a long solenoid which has n turns per unit length an carries a current I is

A) $B = n^2 I$
B) $B = \mu_0 n I$
C) $B = n I / \mu_0$
D) $B = n I^2$

53. Magnetic meridian is

A) A point
B) A line
C) A vertical plane
D) A horizontal plane

54. A vertical wire carries a current upwards. An electron beam sent horizontally toward the wire will be deflected

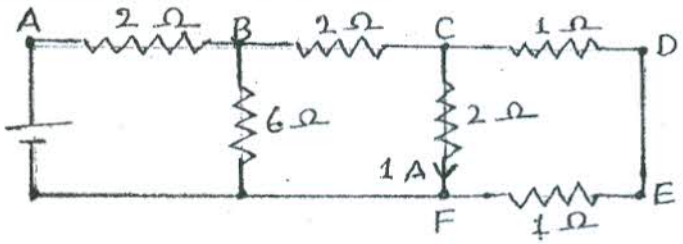
A) Towards left
B) towards right
C) downwards
D) upwards

55. A long wire of radius R carries a current uniformly through its cross section. The ratio $B_1 : B_2$, of field B_1 at a distance R and B_2 at a distance R/2 from the axis, is

A) 1 : 1
B) 2 : 1
C) 1 : 2
D) 1 : 4

56. In the circuit shown below, the current through CF is 1 Ampere. Then current through AB is

A) 1 A
B) 2 A
C) 3 A
D) 4 A



57. A point charge +q is placed at the centre of a spherical shell of radius R. Another point charge +q is placed at the centre of a cube of side $R\sqrt{2}$. Which of the following statements is <u>not</u> true?

A) Flux of electric field E over spherical surface = flux of electric field over total surface of cube
B) Flux through one face of cube = $q/(6\varepsilon_0)$
C) Flux through a hemisphere = $q/(2\varepsilon_0)$
D) If the sphere is metallic, then flux through a surface inside the sphere is not equal to the flux through a surface outside the sphere.

58. A source of sound moves towards an observer.

A) The frequency of the source increases.
B) Velocity of sound in the medium increases
C) Wavelength of sound in the medium towards the observer decreases.
D) Amplitude of vibration of particles in the medium is increased.

59. The current sensitivity of a moving coil galvanometer can be increased by

A) Adding a shunt in parallel
B) Adding a resistance in series
C) Increasing the torsional constant of the suspension wire
D) Increasing the number of turns.

60. A man of mass m is standing on a platform of mass M placed on smooth ice. The man starts walking on the platform with speed v relative to the platform. The platform recoils with velocity V relative to the ice where V =

A) v
B) $\frac{mv}{M+m}$
C) $\frac{Mv}{M+m}$
D) $\frac{M+m}{M}v$

Question Booklet Series : **A** *Question Booklet Sr. No.* 300352

PU-CET (BDS) – 2014

Paper – III: Biology

Important: *Please consult your Admit Card/Roll No. slip before filling your Roll Number on the Test Booklet and Answer Sheet.*

Roll No. *In Figure* *In Words*

O.M.R. Answer Sheet Serial No.

Signature of the Candidate _____

Time: 70 minutes **Number of Questions: 60** **Maximum Marks :120**

INSTRUCTIONS

1. Write your roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Code No. of Question Booklet on the OMR answer Sheet. Darken the corresponding bubbles with **Black Ball Point/Black Gel Pen**.
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. Please check that this Question Booklet contains 60 questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
5. Each question has four alternative answer (A, B, C, D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point/Black Gel Pen.** Each question carries 2 marks. **For every wrong answer, 25% i.e. ¼ mark allotted to the question will be deducted.**
6. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
7. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
8. If you want to change an already marked answer, erase the shade in the darkened bubble completely.
9. For rough work only the blank sheet at the end of the Question Booklet be used.
10. The Answer Sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e. not following the instructions completely, shall be of the candidate only**.
11. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
12. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/ noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so would be expelled from the examination.
13. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
14. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculators is not allowed.**

1. Potato is (underground) stem because it

   A) has axillary buds (eyes)

   B) Lacks chlorophyll

   C) Does not bear roots

   D) Contains reserve food

2. The largest leaf belongs to

   A) Nerium

   B) Tobacco

   C) Victoria

   D) Rafflesia

3. Fruit of custard apple is

   A) Etaerio of berries

   B) Etaerio of follicles

   C) Etaerio of achenes

   D) Etaerio of drupes

4. Radial vascular bundles are found in

   A) Angiosperm stem

   B) Angiosperm root

   C) Angiosperm leaf

   D) Angiosperm seed

5. A bundle in which xylem is sandwiched by phloem on both the sides is (p353 15)

   A) Concentric

   B) Radial arch

   C) Bicollateral

   D) Collateral

6. Linnaeus included algae in 2264 q in question bank-botany

A) Cryptogamia

B) Ascomycetes

C) Acrasieae

D) Myxomycetes

7. Brown algae are characterized by the presence of

A) Phycocyanin

B) Phycoerythrin

C) Fucoxanthin

D) Haematochrome

8. The yield of paddy rice can be increased by application of

A) Nostoc-

B) Symbiotic bacteria

C) Iron bacteria

D) Archaebactria

9. In gymnosperms, the only mode of pollination is

A) Hydrophily

B) Zoophily

C) Entomophily

D) Anemophily

10. The cell wall of diatoms is rich in

A) Calcium

B) Lignin

C) Silica

D) Carbonate

11. The rudimentary seed habit has been attained in

A) *Psilotum*
C) *Selaginella*
B.) *Lycopodium*
D) *Equisetum*

12. Which of the following gymnosperms is said to have double-fertilization

A) *Gingko*
B.) *Pinus*
C.) *Cycas*
D) *Ephedra*

13. Which of the following produces seeds but not flowers?

A) *Pinus*
B) Mint
C) Maize
D) *Ficus* species

14. The edible part of the ripe mango is morphologically

A) Epicarp
B.) Mesocarp
C) Pericarp
D) Endocarp

15. In *Opuntia* plant, the stem is

A) Cladode
B.) Phyllode
C) Phylloclade
D) Staminode

16. During active absorption of water:

A) Energy is not used
B) Transpiration pull provides force for water absorption
C) Root respiration provides energy
D) Photosynthesis provides energy

17. Phosphorous is a structural element in

A) Fat

B) Starch

C) C. Nucleotide

D) Carbohydrates

18. Boron in plants assists in

A) Acting as enzyme cofactor

B) Photosynthesis

C) Sugar transport

D) Activation of enzymes

19. NADPH is generated through :

A) Photosystem I

B) Photosystem II

C.) Anaerobic respiration

D.) glycolysis

20. In C4 plants, synthesis of sugars/final CO2 fixation occurs in

A) undifferentiated mesophyll cells

B) Bundle sheath cells

C) Epidermal cells

D) Spongy cells

21. Enzymes for glycolysis are present in

A) Mitochondria

B) Cytoplasm

C) glyoxysomes

D) Nucleus

22. Induction of formation of interfascicular cambium is done by

A) Cytokinin

B) Gibberellin

C) Auxin

D) Ethylene

23. Moment of pollen tube growth towards micropyle of ovule depends upon

A) Thigmotropism

B) Chemotropism

C) Thermotropism

D) Hydrotropism

24. To remove seed dormancy by mechanical removing of seed coat is called:

A) stratification

B) Vernalization

C) Scarification

D) photoperiodism

25. Senescence is inhibited by

A) Ethylene

B) Gibberellic acid

C) Abscisic acid

D) Cytokinin

26. The transition zone where two different types of communities meet is called:

A) Ecotype

B) Ecoline

C) Ecotone

D) Ecosystem

27. Succession in an ecosystem is the result of

A) Occurrence of diseases

B) changes in grazing habits of the animals

C) competition among animals

D) adaptive ability to environmental changes

28. What is the name given for an association of two species where one is benefited other remains unaffected or unharmed?

A) Parasitism

B) Symbiosis

C) Commensalism

D) Predation

29. The study of interelationship between species and its environment of a forest is called:

A) Autecology

B) Syneocology

C) Forest ecology

D) Cooperation

30. The hypogeal germination is found in:

A) Bean

B) Maize

C) Rhizophora

D) Cucurbita

31. A high concentration of which hormone is necessary for ovulation?
    A) FSH
    B) LH
    C) Estrogen
    D) Progesterone

32. Foetal haemoglobin in man
    A) Has more oxygen carrying capacity than the adult
    B) Has less oxygen carrying capacity than the adult
    C) Has same oxygen carrying capacity as the adult
    D) Has no oxygen carrying capacity

33. GIFT is
    A) A god given asset
    B) A trait passed from parent to offspring
    C) A treatment for infertility
    D) A scheme for the girl child

34. An adolescent complains to her parents about the dominant behavior of her elder brother, his better muscular strength and power. The parents can explain this on the basis of
    A) Age
    B) Societal norms
    C) Hormones
    D) Diet

35. The scientific name of man which is *Homo sapiens* was given by
    A) Linnaeus
    B) Lamarck
    C) Aristotle
    D) Darwin

36. Which of the following is not a connective tissue
    A) Adipose
    B) Bone
    C) Nervous
    D) Blood

37. How many pairs of spiracles are present in cockroach?
    A) 5
    B) 10
    C) 15
    D) 20

38. The term digastric refers to
    A) Two parts of stomach
    B) Presence of pyloric and cardiac regions
    C) Muscle of jaw
    D) Muscles of stomach wall

39. A temporary endocrine gland in human body is
    A) Islets of Langerhans
    B) Pineal body
    C) Corpus luteum
    D) Corpora cardiaca

40. The human cochlea has how many turns?
    A) One
    B) Two
    C) Two and a half
    D) Three

41. Which of the following is used for making bread:
    A) LAB
    B) Bifidobacterium
    C) Acetobacter
    D) Saccharomyces

42. The functional unit of the kidney is
    A) Nephron
    B) Neuron
    C) Bowmann`s capsule
    D) Loop of Henle

43. Which is the only country to re- use sewage effluent for drinking water after treatm
    A) Vienna
    B) Ethiopia
    C) Indonesia
    D) Singapore

44. Which of the following is not a part of colon
    A) Ascending
    B) Descending
    C) Sigmoid
    D) Convoluted

45. Which of the following is responsible for color differentiation by the eyes
    A) Rods
    B) Cones
    C) Vitreous humor
    D) Both rods and cones

46. Which of the following is caused by pleiotropic gene
    A) Thalassemia
    B) Haemophilia
    C) Sickle-cell anaemia
    D) Color Blindness

47. Which of the following is true for Mendel`s first law?
    A) Gametes are produced by hybridization
    B) Gametes are never hybrids
    C) Gametes show dominance
    D) Punnett hypothesis

48. Which of the following is one of the largest chromosome?
    A) Salivary gland chromosomes of *Chironomus*
    B) Y chromosome of man
    C) Sex chromosome of butterfly
    D) Sat-chromosome of *Rhodnius*

49. Eco RI which is isolated from the bacterium *Escherichia coli* is
    A) Topoisomerase
    B) Restriction enzyme
    C) DNA gyrase
    D) Primase

50. A technique used by forensic scientists to help in the identification of criminals is
    A) Pedigree graph
    B) Chi-square test
    C) DNA fingerprinting
    D) PCR

51. In Klinefelter syndrome the 2n chromosome number is
    A) 47
    B) 45
    C) 46
    D) 45+1

52. In the geological time scale which of the following is the `age of man`
    A) Mesozoic
    B) Quaternary
    C) Proterozoic
    D) Tertiary

53. Taung baby is
    A) Cloned human baby
    B) Cloned Chimpanzee
    C) Cloned goat
    D) Hominid fossil

54. Anti-tobacco day is observed on
    A) 30th April
    B) 31st May
    C) Ist June
    D) 15th July

55. Some drugs take one to a world of fantasy giving one false happiness. Adolescents should be warned against the use of such drugs which are known as
    A) Stimulants
    B) Hallucinogens
    C) Depressents
    D) Sedatives

56. The process by which a pathogen is marked for ingestion and destruction by a phago is
    A) Opsonisation
    B) Immunisation
    C) Anaphylaxis
    D) Agglutination

57. Bt cotton is a genetically engineered variety of cotton for
    A) Improving yield
    B) Improving whiteness
    C) Repelling pests
    D) Fixing nitrogen

58. Immediate hypersensitivity is mediated by
    A) IgG
    B) IgA
    C) IgM
    D) IgE

59. The egg case of cockroach which contains several eggs packed together is known as
    A) Otolith
    B) Ootheca
    C) Spermatophore
    D) Nymph

60. What is responsible for the nodding movement of the skull
    A) Prezygapophyses
    B) Atlas
    C) Axis
    D) Typical cervical vertebra

-ooo-

Panjab University, Chandigarh

BDS-2014

ANSWERS / KEY

Subject: CHEMISTRY

1	2	3	4	5	6	7	8	9	10
A	C	A	D	D	A	D	C	B	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	B	C	A	A	D	C	B	A	D
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	C	D	C	A	A	B	C	C	D
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	C	C	A	D	B	B	C	D	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
C	A	B	D	C	A	D	C	A	B
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
A	B	C	C	A	B	D	B	A	A

Note: An 'X' in the key indicates that either the question is ambiguous or it has printing mistake. All candidates will be given credit for this question.

Panjab University, Chandigarh

BDS-2014

ANSWERS / KEY

Subject: PHYSICS

1	2	3	4	5	6	7	8	9	10
D	B	B	D	C	X	X	B	A	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	A	A	B	D	D	D	A	C	C
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	C	B	A	X	C	B	A	A	C
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
X	B	A	B	B	B	B	C	D	B
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
C	X	D	X	A	A	C	C	C	B
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
X	B	C	D	B	C	D	X	D	X

Note: An 'X' in the key indicates that either the question is ambiguous or it has printing mistake. All candidates will be given credit for this question.

Panjab University, Chandigarh

BDS-2014

ANSWERS / KEY

Subject: BIOLOGY

1	2	3	4	5	6	7	8	9	10
A	C	A	B	C	A	C	A	D	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	D	A	B	C	C	C	C	A	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	A	B	C	D	C	D	C	A	B
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
B	A	C	C	A	C	B	C	C	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
D	A	D	D	B	C	B	A	B	C
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
A	B	D	B	B	A	C	D	B	B

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