



12. In circuit X,  $L = 100\text{m H}$  and  $C = 100\mu\text{ F}$  are attached in series. In circuit Y,  $L = 100\text{mH}$  and  $C = 10\mu\text{ F}$  are attached in parallel, the resonating frequency  $f_x$   $f_y$  are related as:  
 A)  $f_x = f_y$  B)  $f_x = 10f_y$   
 C) None of these D)  $f_x = 0.01f_y$
13. A transformer has 100 turns on the input side and 500 turns on the output side. If rms value of input voltage and current is 220V and 5A respectively. The output power is:  
 A) 500 Watt B) 1100 Watt  
 C) 1440 Watt D) 50 Watt
14. A truck of mass 5000 Kg and a car of mass 1000 Kg are both travelling at a speed of 36 Km/hr. Assume the force required to stop the truck in 10 sec is X newton and the force required to stop the car in 10 sec is Y newton. The difference X and Y is equal to?  
 A) 4 MN B) 4 KN  
 C) 14.4 KN D) None of these
15. A tight wire is clamped at two points 2 m apart. It is plucked near one end, what are the three longest wavelengths produced on the vibrating wire:  
 A) 2m, 1m, 0.67m B) 4m, 2m, 1.33m  
 C) 4m, 2m, 1.33m D) 1m, 0.5m, 0.33m
16. When using optical fiber in data transmission, the angle of incidence  $i$  of the light source on the glass fiber should be?  
 A) Less than critical angle B) Greater than critical angle  
 C) Less than angle of refraction D) Greater than angle of refraction
17. Consider two spheres A and B of radii  $r_a$  and  $r_b$  both concentric with point charge Q. if  $r_a > r_b$  then the total flux passing normally through the sphere A and B is related as?  
 A) Flux through A is greater B) Flux through B is greater  
 C) Flux through both spheres is equal D) Flux through A may be greater or less than B
18. A mixture of two gases at constant temperature contain molecules of two kinds. The first kind is of mass  $m_1$  and rms speed  $c_1$  and the second has mass  $m_2$  and rms speed  $c_2$ . The ratio  $\frac{C_1}{C_2}$  is:  
 A)  $\frac{m_1}{m_2}$  B)  $\frac{m_2}{m_1}$   
 C)  $\left[\frac{m_1}{m_2}\right]^{\frac{1}{2}}$  D)  $\left[\frac{m_2}{m_1}\right]^{\frac{1}{2}}$
19. A 500 kg rocket travels in deep space at a constant speed of 3000 m sec<sup>-1</sup>. The power being produced by the rocket engine at this time is:  
 A) 1500 KW B) 0.16 KW  
 C) 6 KW D) None of these
20. A shell is fired at an angle of 45 degrees above ground with an initial velocity of 100 m sec<sup>-1</sup>. It will hit the ground, assuming  $g = 10\text{ m sec}^{-2}$ , after how long:  
 A) 7 seconds B) 14 seconds  
 C) 10 seconds D) 20 seconds
21. In an inelastic collision between two bodies, the following is conserved:  
 A) kinetic energy only B) Kinetic energy and momentum  
 C) Momentum only D) Total energy and momentum
22. Young's double slit experiment is used to study interference of:  
 A) Microwaves B) Radio waves  
 C) Sound waves D) Visible light
23. You have 10 resistors available, each of 20 KW. You need to form a 2.5 KW resistor for your circuit using the available resistors. You can connect:  
 A) Eight 20 KW in series B) Eight 20 KW in parallel  
 C) Four 20 KW in parallel D) None of these
24. You have 15 capacitors available with you, each of 15 nF. You need a capacitance for around 150 nF in a circuit.  
 A) 10 capacitors in series B) 12 capacitors in series  
 C) 10 capacitors in parallel D) 8 capacitors in parallel
25. The following device does not use electromagnetic waves for its operation:  
 A) Ultra – sound machine B) Radar  
 C) x – Rays Machine D) Mobile phone
26. A 1000 kg truck carrying a load of 500 kg travels on a mountain for 5 minutes at constant speed. Its power output is 2500 watts. Assuming  $g = 10\text{ m/sec}^2$ , it will achieve a vertical height of:  
 A) 75 m B) 50 m  
 C) 1.2 m D) 100 m
27. When a metal surface is exposed in light, it may emit electron. The maximum energy of these electrons depends on:  
 A) Intensity of light B) Area of metal surface



31. Asim is now three times as old as Irfan. After 10 years, Asim will be twice as old as Irfan. Asim's at this time is:  
 A) 10  
 B) 20  
 C) 30  
 D) 40
32. The solution of the equation  $x dy + (y - 1)dx = 0$  is:  
 A)  $\ln[x + (y - 1)] = 0$   
 B)  $x(y - 1) = c$   
 C)  $xe^{(y-1)} = c$   
 D)  $xy + x(y - 1) = c$
33. The maximum value of the function  $f(x, y) = -x + 3y$  subject to constraints  $-x \leq 2$ ,  $x \leq 3$  and  $y \leq 1$  is at:  
 A)  $(-100, 100)$   
 B)  $(-2, 1)$   
 C)  $(-100, 0)$   
 D)  $(3, 1)$
34. Vectors  $\underline{u} = a\underline{i} - \underline{j} + \underline{k}$  and  $\underline{v} = \underline{i} - 2\underline{j} + b\underline{k}$  are collinear if:  
 A)  $a = 1, b = 1$   
 B)  $a = \frac{1}{2}, b = 2$   
 C)  $a = 2, b = \frac{1}{2}$   
 D)  $a = -1, b = -1$
35. Vectors  $\underline{u} = a\underline{i} - \underline{j} + \underline{k}$  and  $\underline{v} = \underline{i} - 2\underline{j} + b\underline{k}$  are perpendicular if:  
 A)  $a = 3, b = -1$   
 B)  $a = 2, b = -1$   
 C)  $a = 1, b = -3$   
 D)  $a = -1, b = -1$
36. Equation of a circle with centre at  $(4, 3)$  and radius = 2 is given by:  
 A)  $(x + 4)^2 + (y + 3)^2 = 4$   
 B)  $4x^2 + 3y^2 = 4$   
 C)  $(x^2/16) + (y^2/9) = 4$   
 D)  $x^2 + y^2 - 8x - 6y + 21 = 0$
37. The equation  $x^2 + \frac{(y-1)^2}{4} = 1$  represents:  
 A) A circle with centre at  $(0, 1)$  and radius = 2  
 B) A parabola with parameter  $a = 4$   
 C) An ellipse with centre at  $(0, 1)$  and minor axis of length 1  
 D) A hyperbola with parameter  $a = 4$
38. Let  $y = \int \left[ 4 \cos^2 \left( x + \frac{\pi}{3} \right) - 2 \right] dx$ , then  $y$  equals:  
 A)  $4 \cos^2 \left( x + \frac{\pi}{3} \right) - 2x + c$   
 B)  $4 \sin^2 \left( x + \frac{\pi}{3} \right) - 2x + c$   
 C)  $\sin \left( 2x + \frac{2\pi}{3} \right) + c$   
 D) None of the above
39.  $f(x_0 + \delta x) \approx f(x_0) + f'(x_0)\delta x$ , therefore the approximate value of  $\sin \left( \frac{9\pi}{10} \right)$  is:  
 A)  $\frac{\pi}{10}$   
 B) 0  
 C)  $-\frac{\pi}{10}$   
 D)  $\frac{9\pi}{10}$
40. The hypotenuse of a right triangle is 5 cm. To obtain a triangle with maximum area, the sides must be:  
 A) 4 cm and  $\sqrt{39}$  cm  
 B) Both  $\sqrt{5}$  cm  
 C) Both  $2\sqrt{5}$  cm  
 D) Both  $\frac{\sqrt{5}}{2}$  cm
41. If  $y = e^{\sin x \cos x}$ , then  $\frac{dy}{dx}$  is:  
 A)  $e^{\sin x \cos x} \sin x \cos x$   
 B)  $e^{\sin x \cos x} \cos 2x$   
 C)  $e^{\sin x \cos x} \sin 2x$   
 D) None of the above
42. The function  $f(x) = \frac{x^3}{3} - \frac{x^2}{2} + 5$  has:  
 A) An inflexion at  $x = 1$   
 B) A relative minimum at  $x = 1$   
 C) An inflexion at  $x = 0$   
 D) A relative minimum at  $x = 0$
43. The line that passes through the point of intersection of  $x + y - 1 = 0$  and  $x = 0$  and is parallel to the line  $x - y = 0$  is given by:  
 A)  $y = x - 1$   
 B)  $y = -x - 1$   
 C)  $y = x + 1$   
 D)  $y = -x + 1$
44.  $\log_3 27 - \log_5 25$  is equal to:  
 A)  $\log_4 2$   
 B) 2  
 C) 1  
 D) None of the above
45. If  $y = 2^x$ , then  $\frac{dy}{dx}$  equals:  
 A)  $2^x$   
 B)  $2^x \ln 2$

- C)  $x 2^x$  D)  $\log 2x$
46. A particle's trajectory in space is given by  $x = 8t - 2t^2, y = 12t - t^2, z = 4$ , the particle is at rest at the point:  
 A) (0, 0, 0) B) (0, 0, 4)  
 C) (8, 16, 4) D) None of the above
47. If  $f(x) = 3x - 1$  and  $g(x) = x(x - 1)$ , then  $gf^{-1}(x)$  is:  
 A)  $\frac{x}{3}(x + 1)$  B)  $\frac{x}{3}(x - 1)$   
 C)  $3x(3x - 1)$  D)  $\frac{x}{3}(\frac{x}{3} + 1)$
48. The period of the function  $y = 3 \sin(\frac{t}{8})$  is:  
 A)  $24\pi$  B) 24  
 C)  $8\pi$  D)  $16\pi$
49. A wire of length L can be shaped into a circle or a square. The ratio of the area of the square divided by the area of the circle is:  
 A)  $\pi/4$  B)  $\pi L/4$   
 C)  $\pi^2/L^2$  D) None of the above
50. If  $\sin(x + \frac{\pi}{2}) = \cos(x + \pi)$  and  $-\pi \leq x \leq 2\pi$ , then x equal to:  
 A)  $\pi/2$  B)  $7\pi/4$   
 C)  $-3\pi/2$  D)  $3\pi/2$
51.  $\log_2 8x = 18$  means that x is equal to:  
 A)  $2^{15}$  B)  $2^6$   
 C)  $\frac{1}{3} \times 2^{18}$  D)  $2^{45}$
52. Using Binomial theorem,  $\sqrt[5]{40}$  approximates to:  
 A) 2.0 B) 2.5  
 C) 2.1 D) 2.4
53. A box contains 15 red, 10 green and 5 yellows toffees. Asim picks 2 green toffees and 1 red toffee out of the box and eats them. What is the probability that Irfan will now pick a green toffee to eat?  
 A)  $10/30$  B)  $8/27$   
 C)  $8/30$  D)  $8/22$
54. The  $k$ th term of a series is given by  $2^k 3^{-k}$ . The sum of the first 100 terms approximately:  
 A) 2 B) 1.5  
 C) 1 D)  $(2/3)^{100}$
55. Let  $f(x) = 6x^3 - x^2 - 4x - 1$ :  
 A)  $(x + 2)$  is a factor of  $f(x)$  B)  $x = -1$  is a root of  $f(x) = 0$   
 C)  $(x - 1)$  is a factor of  $f(x)$  D)  $x = 2$  is a root of  $f(x) = 0$
56. If the set  $S = \{-1, 0, 1\}$ :  
 A) Division is a binary operation on S B) Addition is not a binary operation on S  
 C) S is closed with respect to division D) S is closed with respect to Multiplication
57. The additive inverse of  $/(3 - i)$ , where  $i = \sqrt{-1}$  is:  
 A)  $-3 + i$  B)  $3 - i$   
 C)  $-3 - i$  D)  $3 + i$
58. A body moves in a straight line from a point X with a speed of  $v = 50 \sin \pi t$ . The value of X after 30 minutes?  
 A)  $\frac{50}{\pi} km$  B)  $50\pi km$   
 C)  $0 km$  D)  $-\frac{50}{\pi} km$
59. The reduced low echelon form of a linear system given by  $\begin{bmatrix} 1 & 0 & 0 & | & 0 \\ 0 & 2 & -1 & | & 3 \\ 0 & 0 & 0 & | & 1 \end{bmatrix}$ :  
 A) No solution B) Exactly one solution  
 C) Two solution D) Infinitely many solution
60.  $A = \begin{bmatrix} 1 & 1 & 1 & 3 \\ 2 & 0 & 0 & 2 \\ 0 & 2 & 0 & 2 \\ 0 & 0 & 2 & 2 \end{bmatrix}$ . The rank of matrix A is:  
 A) One B) Two  
 C) Three D) Four

Chemistry

61. What is the empirical formula of glucose:  
 A)  $CH_2O$  B) CH  
 C)  $C_6H_{12}O_6$  D) CHO
62. Which of the following statements is correct:

- A) 1.008g of H has  $6.02 \times 10^{23}$  atoms      B) 2.016g of H<sub>2</sub> has  $2 \times 6.02 \times 10^{23}$  atoms  
 C) 1.008g of H<sub>2</sub> has  $6.02 \times 10^{23}$  atoms      D) Both Options A and B are correct

**Note: According to given statement all options are correct but in key of UET paper 2017 the right answer is A)**

**63. Base principle of crystallization is:**

- A) Solution should be completely soluble in solvent at room temperature so that the solute is thrown out of crystals at any temperature  
 B) Solute should be soluble in a suitable amount of solvent at high temperature and excess amount of solute is thrown out as crystals when it is cooled  
 C) Solute should not be soluble in suitable amount of solvent at any temperature so that the solute is thrown out as crystals at any temperature  
 D) Solute should not be affected by temperature for its solubility in order to form crystals

**64. The bubbling up of gas from soda drink is best explained by:**

- A) Gas diffuses from the liquid into the surroundings  
 B) Gas diffuses from the surroundings into the liquid  
 C) The low density of gas as compared to the liquid cause the gas to bubble up  
 D) Decreased pressure of the surroundings cause the gas to come out from high pressure liquid

**65. The effect of pressure on density of gas is explained as under:**

- A) Increase in pressure cause decrease in density  
 B) Decrease in pressure results in increase in density  
 C) Increase in pressure causes increase in density  
 D) No effect

**Note: According to given statement the right answer is C but in key of UET paper 2017 the right answer is B)**

**66. Forces which make the liquefaction of Helium gas possible are:**

- A) Debye forces      B) London dispersion forces  
 C) Dipole dipole forces      D) Liquefaction is not possible

**67. Existence of sulphur in two forms is:**

- A) Allotropy      B) Polymorphy  
 C) Isomorphy      D) Anisotropy

**68. The boiling point of hydrofluoric acid (HF) as compared to water (H<sub>2</sub>O) is due to:**

- A) Fluoride (F) being less electronegative than oxygen  
 B) Formation of one hydrogen bond by F atom per HF molecule as compared to two hydrogen bonds by O atom per H<sub>2</sub>O molecule  
 C) Boiling point of HF is more than the boiling point of water  
 D) Statement A and B are correct

**69. Radiations emitted in the form of Photons when electrons of Hydrogen atom fall from higher level to n = 1 level are in the:**

- A) Visible light region      B) Infra-red region  
 C) X-ray region      D) Ultra-violet region

**70. The structure of nitrogen molecule (N<sub>2</sub>) is explained by:**

- A) End to end overlap of orbitals form sigma (σ) bond and sideways overlap of other orbitals form two pi (π) bonds  
 B) End to end overlap of orbitals one sigma (σ) and end to end overlap of other orbitals form two pi (π) bonds  
 C) One sigma (σ) bond and two pi (π) bond  
 D) Both options A and C are correct

**71. The solubility of sodium chloride in water is possible because:**

- A) Hydration energy of water is greater than lattice energy  
 B) Lattice energy of sodium chloride is greater than hydration energy  
 C) Ions of sodium chloride are tightly bound in their lattices  
 D) Hydration energy of water is less than lattice energy

72. Calculate enthalpy change in formation of  $\text{NaHCO}_3(\text{aq})$  using Hess's law:  
 $2\text{NaOH}_{(\text{aq})} + \text{CO}_{2(\text{g})} \longrightarrow \text{Na}_2\text{CO}_{3(\text{aq})} + \text{H}_2\text{O}(\text{L}); \quad \Delta H = -89.08\text{kJ} \quad (\text{i})$   
 $2\text{NaOH}_{(\text{aq})} + \text{CO}_{2(\text{g})} \longrightarrow \text{NaHCO}_{3(\text{aq})} + \text{NaOH}(\text{aq}); \quad \Delta H = \text{-----kJ} \quad (\text{ii})$   
 $\text{NaHCO}_{3(\text{aq})} + \text{NaOH}_{(\text{aq})} \longrightarrow \text{Na}_2\text{CO}_{3(\text{aq})} + \text{H}_2\text{O}(\text{L}); \quad \Delta H = -41.02\text{kJ} \quad (\text{ii})$   
 A) -130.10kJ  
 B) -48.06kJ  
 C) +48.06kJ  
 D) +130.10kJ
73. According to first law of thermodynamics, if thermal energy is applied to water placed in a cylinder fitted with a frictionless piston:  
 A) Thermal energy is converted into kinetic energy of water molecules  
 B) Pressure of water molecules increases  
 C) The piston is pushed up  
 D) All of the above
74. In the reaction  $\text{CO}_{(\text{g})} + \text{H}_2\text{O}_{(\text{g})} \rightleftharpoons \text{CO}_{2(\text{g})} + \text{H}_{2(\text{g})}; \quad \Delta H = -41.84\text{kJ/mol}$ , if heat is applied at equilibrium stage, it is observed that:  
 A) More  $\text{CO}_2$  and  $\text{H}_2$  are produced to compensate for temperature change  
 B) The reaction will move in backward direction for compensation  
 C) No change will take place  
 D) The reaction will stop
75. NaCl is not soluble in acetone because:  
 A) The polarity of acetone is weak as compared to NaCl  
 B) Acetone molecules cannot overcome the inter-ionic forces of NaCl  
 C) Acetone is moderately polar solvent  
 D) All of the above
76. Ethylene glycol is mixed with water in automobile radiators as antifreeze because:  
 A) It increases the boiling point of radiator coolant  
 B) It is non-volatile in character  
 C) Has low vapour pressure as compared to water  
 D) All of the above
77. Oxidation number of sulphur in  $\text{SO}_4^{2-}$  is:  
 A) +6  
 B) +4  
 C) -6  
 D) +2
78. During the purification process of copper, a thin sheet of pure and impure copper is placed in electrolytic cell, which results in:  
 A)  $\text{Cu}^-$  from impure sheet converts to  $\text{Cu}^{+2}$  ions and migrate to cathode impurities are left at anode  
 B)  $\text{Cu}^-$  from impure sheet converts to  $\text{Cu}^{+2}$  ions and migrate to anode. Impurities are left as cathode  
 C)  $\text{Cu}^{+2}$  from impure sheet converts to  $\text{Cu}^-$  and migrate to anode and impurities are left at cathode  
 D)  $\text{Cu}^{+2}$  from solution migrate to cathode and pure copper starts to deposit on cathode
79. The purpose of two half cells in a galvanic cell is:  
 A) More ions can be produced due to presence of two half cells  
 B) Chemical reaction between the solutions of two half cells does not take place  
 C) More current can be generated due to two half cells  
 D) None of the above
80. Catalyst helps in a reaction by:  
 A) Increasing the rate of reaction  
 B) Lowering the activation energy barrier  
 C) Increasing the activation energy barrier  
 D) Both Options A and B are correct
81. Sub-group "B" of the periodic table represents:  
 A) Normal elements  
 B) Less typical elements  
 C) Block "p" elements  
 D) Block "f" elements
82. When an electron is added to  $\text{O}^-$  then the energy change is expressed by:  
 A) Electron affinity  
 B) Energy release  
 C) Energy absorption  
 D) Both options A and C are correct
83. The important usage of lime in agriculture is:  
 A) For chlorophyll development  
 B) As fertilizer  
 C) For neutralizing acidic soils  
 D) To increase fruit production
84. Quartz crystal has typical tetrahedral structure between oxygen and silicon atoms. How many silicon atoms are connected to an oxygen atom in this structure:  
 A) 4  
 B) 3  
 C) 2  
 D) 1
85. In the reaction  $\text{H}_2\text{S} + \text{NO}_2 \longrightarrow \text{H}_2\text{O} + \text{S} + \text{NO}$ ,  $\text{NO}_2$  acts as:  
 A) An oxidizing agent  
 B) A dehydrating agent  
 C) A reducing agent  
 D) A catalyst
86. In the reaction  $\text{HCOOH} \xrightarrow{\text{conc. H}_2\text{SO}_4} \text{CO} + \text{H}_2\text{O}$ ,  $\text{H}_2\text{SO}_4$  acts as:  
 A) A catalyst  
 B) A reducing agent





- 97. The word “independent” in line 63 most nearly means**
- A) Individualistic
  - B) Affluent
  - C) Self-governing
  - D) Regardless
- 98. In the passage, the author does all of the following except:**
- A) Deny a possibility
  - B) Correct a misapprehension
  - C) Describe a reaction
  - D) Pose a question
- 99. In the paragraphs immediately following this passage, the author most likely will**
- A) Explain why scientists previously confused the tarantula’s three tactile responses
  - B) Demonstrate how the tarantula’s three tactile
  - C) Point out the weaknesses of the digger wasp that enable the tarantula to subdue it
  - D) Describe how the digger wasp goes about attacking tarantulas
- 100. The word “They” in line 63 refers which of the following**
- A) Crickets
  - B) Spiders
  - C) Tarantulas
  - D) Tactile responses