QUESTION PAPER

Mathematics

1. If α, β are the roots of $x^2\sin\theta - (\cos\theta\ \sin\theta + 1)x + \cos\theta = 0$ where $\alpha < \beta$ and $\theta \in \left(0, \frac{\pi}{4}\right)$ then value of $\sum_{n=0}^{\infty}\left(\alpha^n + \frac{(-1)^n}{\beta^n}\right)$

(A) $\frac{1-\cos\theta}{\sin\theta} + \frac{1-\sin\theta}{\cos\theta}$

(B) $\frac{1}{1+\cos\theta} + \frac{1}{1-\sin\theta}$

(C) $\frac{1}{1-\cos\theta} + \frac{1}{1+\sin\theta}$

(D) $\frac{1}{1-\cos\theta} - \frac{1}{1+\sin\theta}$

2. If $(\cot^{-1}x)^2 - 7(\cot^{-1}x) + 10 > 0$ then range of 'x' will be

(A) $(-\infty, \cot 2)$

(B) $(-\infty, \cot 5)$

(C) $(\cot 2\ ,\ \cot 5)$

(D) $(\cot 2, \infty)$

3. In a hyperbola, length of minor axis is 5 and distance between focii is 13. Then eccentrcity is

(A) $\frac{6}{5}$

(B) $\frac{13}{12}$

(C) $\frac{17}{13}$

(D) $\frac{12}{7}$

4. In $y^2 + 4(x - a^2) = 0$, one of the vertex of triangle is vertex of given parabola and other two vertices are the points where parabola meets the $y-$axis. If area of triangle is 250. Then 'a' will be

(A) 5

(B) $5\sqrt{3}$

(C) $25\sqrt{3}$

(D) $3\sqrt{5}$

5. A circle cuts an intercept on x –axis of length $4a$. If this circle cuts the $y-axis$ at a point whose distance from origin is $2b$, then locus of its centre is

(A) Ellipse

(B) Parabola

(C) Hyperbola

(D) Straight line

6. The centre of an ellipse is at origin and its major axis is coincides with x –axis. The length of semi minor axis is equal to distance between foci and ellipse passes throuh the points $\left(\sqrt{29}, 2\sqrt{\frac{29}{5}}\right)$, then the point which lies on ellipse

(A) $\left(4\sqrt{3}, 2\sqrt{2}\right)$

(B) $\left(4\sqrt{3}, 2\sqrt{3}\right)$

(C) $\left(4\sqrt{2}, 2\sqrt{3}\right)$

(D) $\left(4\sqrt{2}, 2\sqrt{2}\right)$

7. Given $ABCD$ is a parallelogram with vertices as $A(1,2), B(3,4)$ and $C(2,3)$, then the equatoin of line AD is

(A) $x+y+1=0$

(B) $x-y+1=0$

(C) $-x+y+1=0$

(D) $x+y-1=0$

8. A functoin $f:(0,\infty)\to[0,\infty)$ is given by $f(x)=\left|1-\frac{1}{x}\right|$, then $f(x)$ is

(A) Injective but not surjective

(B) Injective and bijective

(C) Injective only

(D) Surjective only

9. If $f(x)$ satisfies the differential equation $\frac{dy}{dx} = (x-y)^2$ and given that $y(1) = 1$, then

(A) $-ln\left|\frac{1-x+y}{1+x-y}\right| = 2(x-1)$

(B) $ln\left|\frac{2-y}{2-x}\right| = x+y-1$

(C) $ln\left|\frac{1-x+y}{1+x-y}\right| = 2(x-1)$

(D) $\frac{1}{2}ln\left|\frac{1-x+y}{1+x-y}\right| + ln|x| = 0$

10. The value of $\int_0^{\frac{\pi}{4}} \frac{dx}{\sin 2x.(\tan^5 x+\cot^5 x)}$ is (Note: In the original question limit was $\frac{\pi}{6}$ to $\frac{\pi}{4}$)

(A) $\frac{\pi}{40}$

(B) $\frac{\pi}{60}$

(C) $\frac{\pi}{120}$

(D) $\frac{\pi}{20}$

11. If the curve C is given by the relatoin $y = x^2 + 1$. Then the area enclosed by the curve C, tangent to curve C at point (2,5) and coordinate axis in the first quadrant is

(A) $\frac{30}{17}$

(B) $\frac{37}{24}$

(C) $\frac{17}{7}$

(D) $\frac{8}{3}$

12. If for a non-cosntant $A.P$, $t_{19} = 0$. Then the ratio of $t_{49} : t_{29}$ is

(A) 1: 2

(B) 2: 3

(C) 3: 1

(D) 1: 3

13. Three are 30 white balls and 10 red balls in a bag. 16 balls are drawn with replacement from the bag. If X be the number of white balls drawn then the value of $\frac{mean(X)}{standard\ deviation\ (X)}$ is equal to

(A) $4\sqrt{3}$

(B) $2\sqrt{3}$

(C) $3\sqrt{3}$

(D) $3\sqrt{2}$

14. $\lim_{x\to 0} \frac{x\cot 4x}{(\cot^2 2x)(\sin^2 x)}$ is equal to

(A) 1

(B) 2

(C) 4

(D) 6

15. If $\int \frac{(x+1)}{\sqrt{2x-1}} dx = f(x)\sqrt{2x-1} + C$. Then $f(x)$ is equal to

(A) $\frac{x+4}{3}$

(B) $\frac{x+3}{4}$

(C) $\frac{2}{3}(x+2)$

(D) $x+4$

16. Position vector of points A, B, C are $\vec{a}, \vec{b}, \vec{c}$ respectively which are given by $\vec{a} = \sqrt{3}\hat{\imath} + \hat{\jmath}$, $\vec{b} = \hat{\imath} + \sqrt{3}\hat{\jmath}, \vec{c} = \beta\hat{\imath} + (1-\beta)\hat{\jmath}$. If distance of point C from angle bisector of OA and OB is $\frac{3}{\sqrt{2}}$ (where O is the origin). Then sum of values of β is

(A) 1

(B) 2

(C) 4

(D) 3

17. If x, y is positive real numbers then maximum value of $\frac{x^m y^n}{(1+x^{2m})(1+y^{2n})}$ is

(A) $\frac{1}{4}$

(B) $\frac{1}{2}$

(C) $\frac{m+n}{6mn}$

(D) 1

18. Contrapositive of the statement. If the squares of two numbers are equal then the numbers are equal is

(A) If the squares of two numbers are not equal then the numbers are equal

(B) If the squares of two numbers are not equal then the numbers are not equal

(C) If two numbers are not equal then the squares of the numbers are not equal

(D) If squares of two numbers are equal then the numbers are not equal

19. Set of values of x for which $f(x) = \sin|x| - |x| + 2(x-\pi)\cos|x|$ is not differentiable is

(A) ϕ

(B) $\{0\}$

(C) $\{0, \pi\}$

(D) $\{\pi\}$

20. Let $S_n = 1 + q + q^2 + \ldots + q^n$ and $T_n = 1 + \left(\frac{q+1}{2}\right) + \left(\frac{q+2}{2}\right)^2 + \ldots + \left(\frac{q+1}{2}\right)^n$. If $\alpha T_{100} = {}^{101}C_1 + {}^{101}C_2 \times S_1 + {}^{101}C_3 \times S_2 + \ldots + {}^{101}C_{101} \times S_{100}$, then the value of α is equal to

(A) 2^{99}

(B) 2^{101}

(C) 2^{100}

(D) -2^{100}

21. If $f(x) = \frac{x}{\sqrt{a^2+x^2}} + \frac{(d-x)}{\sqrt{b^2+(d-x)^2}}$, then

(A) $f(x)$ is strictly increasing

(B) $f(x)$ is strictly decreasing

(C) $f'(x)$ is constant

(D) $f(x)$ is neither increasing nor decreasing

22. Let in ΔABC $\frac{b+c}{11} = \frac{c+a}{12} = \frac{a+b}{13}$ (where $AB = c, BC = a$ annd $AC = b$) and $\frac{\cos A}{\alpha} = \frac{\cos B}{\beta} = \frac{\cos C}{\gamma}$, then possible ordered triplet of (α, β, γ) is

(A) $(9, 17, 25)$

(B) $(19, 7, 25)$

(C) $(7, 19, 25)$

(D) $(19, 25, 7)$

23. If $Det(AA^TB) = 8$ and $Det(AB^{-1}) = 8$, then the value of $Det(BB^TA^{-1})$ is equal to

(A) $\frac{1}{16}$

(B) $\frac{1}{4}$

(C) 16

(D) 1

24. If $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-a-c & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)(x+a+b+c)^2$, then the value of x is equal to

(A) $-2(a+b+c)$

(B) $a+b+c$

(C) $-(a+b+c)$

(D) $2(a+b+c)$

25. If $(x+10)^{50} + (x-10)^{50} = a_0 + a_1x + a_2x^2 + \ldots + a_{50}x^{50}$, then the value of $\frac{a_2}{a_0}$ is equal to

(A) 12.25

(B) 12.75

(C) 11.75

(D) 11.25

26. If $|z| + z = 3 + i$, then value of $|z|$ is

(A) $\frac{5}{3}$

(B) $\frac{3}{5}$

(C) $\frac{4}{3}$

(D) $\frac{3}{4}$

27. If set $A = \{1, 2, 3, \ldots\ldots, 20\}$, then find the number of onto functions from A to A such that $f(k)$ is a multiple of 3, whenever k is a multiple of 4.

(A) $6^5 \times 15!$

(B) $5^6 \times 15!$

(C) $6! \times 5!$

(D) $6! \times 15!$

Solution: (D)

28. Two points $A(7, 0, 6)$ and $B(3, 4, 2)$ lie on a plane P_1. Plane $P_2: 2x - 5y = 15$ is perpendicular to the plane P_1 and the point $(2, \alpha, \beta)$ also lie on plane P_1. Then find the value of $(2\alpha - 3\beta)$

(A) 12

(B) 17

(C) 5

(D) 7

Physics

1. A particle is initially at position $(2m, 4m)$, started moving is moving with velocity $(5\hat{\imath} + 4\hat{\jmath})\ m/s$ and with constant acceleration $(4\hat{\imath} + 4\hat{\jmath})\ m/\text{sec}^2$. After 2 seconds the distance of particle from origin is:

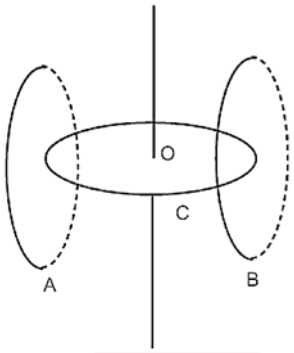
(A) $10\sqrt{2}m$

(B) $20\sqrt{2}m$

(C) $40\ m$

(D) $10m$

2. Find the moment of inertia of the following 3 disc arrangement shown in the figure, about the axis passing through the centre $'O'$ of the central disc and perpendicular to its plane. The other two disc are perpendicular to the first disc and their centres touch the rim of the horizontal disc. All discs have the same mass (m) and radius (R).



(A) $6mR^2$

(B) $5mR^2$

(C) $3mR^2$

(D) $4mR^2$

3. What is the time period of seconds pendulum on a planet similar to earth but mass and radius three times as that of earth.

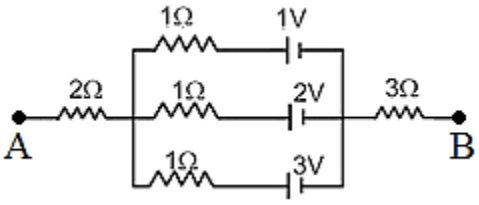
(A) $2\,\text{sec}$

(B) $6\,\text{sec}$

(C) $\frac{2}{\sqrt{3}}\text{sec}$

(D) $2\sqrt{3}\,\text{sec}$

4. For given circuit find $V_A - V_B$



(A) $1\,V$

(B) $3\,V$

(C) $2\,V$

(D) $4\,V$

5. A particle with linear momentum of magnitude P is subjected to a force $F = Kt(K > 0)$ which is directed along the direction of initial momentum. The time after which its linear momentum changes to $3P$ is.

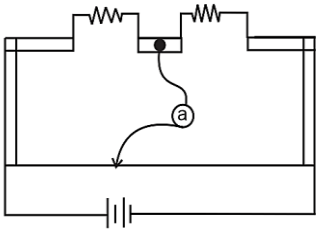
(A) $\sqrt{\frac{2P}{K}}$

(B) $2\sqrt{\frac{P}{K}}$

(C) $\sqrt{\frac{2K}{P}}$

(D) $2\sqrt{\frac{K}{P}}$

6. In a meter bridge experiment, the null point first found at $40cm$ length of the wire. When a 10Ω resistor is connected in series in the left gap resistor, the null point shifts by $10cm$. Now if another resistor (R) is connected in parallel with the combination $(R_1 + 10)\,\Omega$ the null point is found at the previous position. Then the resistance (R) to be connected in parallel is



(A) $20\,\Omega$

(B) $30\,\Omega$

(C) $40\,\Omega$

(D) $60\,\Omega$

7. A force of magnitude $1N$ acts on a point located $5m$ away from origin. If the magnitude of torque of that force is $2.5\,N\text{-}m$ then angle between $\vec{F}$ & position vector of that point is:

(A) $\frac{\pi}{3}$

(B) $\frac{\pi}{6}$

(C) $\frac{\pi}{4}$

(D) $\frac{\pi}{8}$

8. A pendulum has maximum kinetic energy K_1. If its length is doubled keeping amplitude same then maximum kinetic energy becomes K_2. Then relation between K_1 and K_2 is:

(A) $K_2 = 2K_1$

(B) $K_1 = 2K_2$

(C) $K_2 = K_1$

(D) $K_1 = 4K_2$

9. A metal ball of mass $0.1\,kg$ specific heat $400\ J/kg^oC$ is at temperature of 500^oC. Now it is submerged into water of the mass $0.5\,kg$ at 30^oC, which is in a container of heat capacity $800\ kJ/K$. The approximate percentage change in temperature of water.

(A) 20%

(B) 30%

(C) 40%

(D) 50%

10. If speed, V force F and acceleration a are chosen as the fundamental physical quantities then the dimension of Young's modulus in terms of V, F and a is

(A) $[V^{-3}Fa]$

(B) $[V^{-4}F^2a^2]$

(C) $[V^{-4}Fa^2]$

(D) $[V^{-4}F^2a]$

11. The power of a electromagnetic wave is $27\,mW$ which is uniformly distributed over a surface having area $1\,mm^2$. Then the peak value of electric field component of the electromagnetic wave:

(A) 4.5 kV/m

(B) 4.2 kV/m

(C) 5.4 kV/m

(D) 5.5 kV/m

12. In a temperature scale X_0 is boiling point of water and $\frac{X_0}{3}$ is ice point.

In this scale temperature at $\frac{X_0}{2}$ is

(A) 25^oC

(B) 50^oC

(C) 75^oC

(D) 100^oC

13. The focal length of a convex lens is $0.3m$. An object at a distance of $20cm$ is approaching the lens at $5m/s$. The velocity of the image is

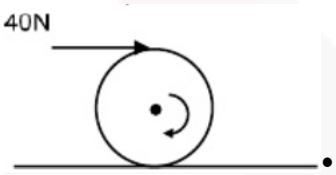
(A) $45\,m/s$

(B) $40\,m/s$

(C) $50\,m/s$

(D) $55\,m/s$

14. On the top point of the hollow cylinder, $40N$ force is acting and the hollow cyllinder rolls without slipping If mass of the hollow cyllinder is $5kg$ and radius of the hollow cyllinder is $0.5\,m$, then the angular acceleration of the hollow cyllinder is:



(A) 6

(B) 10

(C) 12

(D) 16

15. There are two liquids A and B. Such that If $100\,g$ of A at 100^O and $50\,g$ of B at 75^OC are mixed then the equilibrium temperature becomes 90^oC. If $100\,g$ of A at 100^oC and $50\,g$ of B at 50^oC are mixed, then final temperature will be:

(A) 60^oC

(B) 70^oC

(C) 80^oC

(D) 75^oC

16. Maximum current allowed through a galvanometer with 30 divisions and resistance 20Ω is $0.15A$. If resistance R is connected in series with the galvanometer to convert it into a voltmeter of 15 volt, then R is:

(A) $50\ \Omega$

(B) $80\ \Omega$

(C) $60\ \Omega$

(D) $100\ \Omega$

17. In a hydrogen like ion if an electron $de-$excite from M orbit to L orbit, then photon of wavelength λ_1 is released. In case of $de-$excitement from N orbit to L orbit the wavelength of emitted photon is:

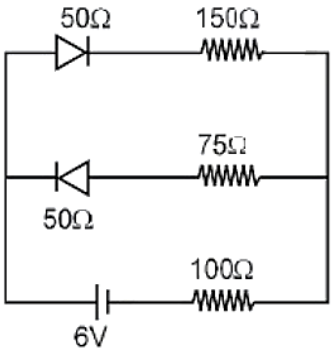
(A) $\frac{20}{27}\lambda_1$

(B) $\frac{27}{20}\lambda_1$

(C) $\frac{13}{6}\lambda_1$

(D) $\frac{14}{19}\lambda_1$

18. In the shown circuit, if he forward biasing resistance of the diode is 50Ω then the current flowing through 100Ω resistor is:



(A) $0.02\ A$

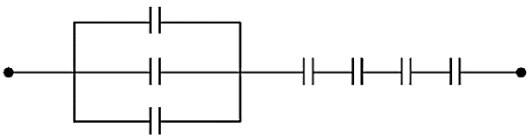
(B) $0.03\ A$

(C) $0.04\ A$

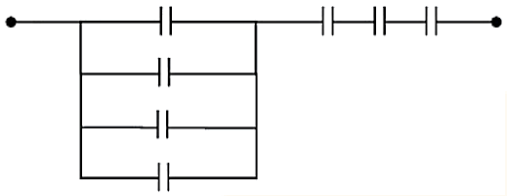
(D) $0.05\ A$

19. Each capacitor has $2\mu F$ capacitance, then which of the given combination gives equivalent capacitance of $\frac{6}{13}\mu F$

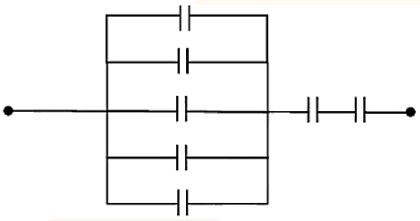
(A)



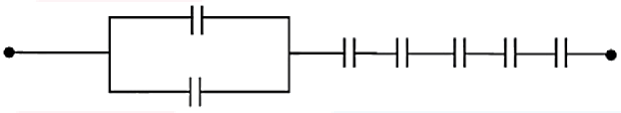
(B)



(C)



(D)



20. An electric dipole is placed in uniform electric field having strength 1000 V/m. The angle between electric dipole and electric field is 45^o. If dipole moment of electric dipole is 10^{-29} C-m then potential energy of the system is:

(A) 7×10^{-27} J

(B) -7×10^{-27} J

(C) 9×10^{-27} J

(D) -9×10^{-27} J

21. Two metal rods of same length L have their coefficient of linear expansion in the ratio $\alpha_1 : \alpha_2 = 4:3$. If the temperature of the first rod is raised by 60^oC, then to keep their final length equal, the temperature of the second rod must be increased by:

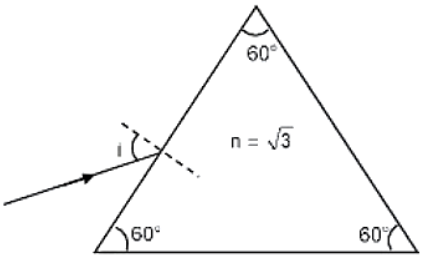
(A) 20^oC

(B) 100^oC

(C) 60^oC

(D) 80^oC

22. Angle of incident for minimum deviation through the prism will be:



(A) 30^oC

(B) 45^oC

(C) 60^oC

(D) 53^oC

23. On a wooden triangular frame wire is wound with n number of turns per unit length. If length of each side of the frame is tripled keeping n same, then self-inductance is:

(A) Decreased by $27\sqrt{2}$

(B) Decreased by 9

(C) Increased by 3

(D) Increased by 27

24. There exists a limited region of uniform magnetic field in z –direction from $y = 0$ to $y = d$ in which a particle of charge Q and mass m enters with a velocity $v\hat{\imath}$. If $d = \frac{mv}{2QB}$, then acceleration vector at the time of emerging from magnetic field will be:

(A) $\left(\frac{-\sqrt{3}\hat{\imath}-\hat{\jmath}}{2}\right)\frac{QvB}{m}$

(B) $\left(\frac{\sqrt{3}\hat{\imath}+\hat{\jmath}}{2}\right)\frac{QvB}{m}$

(C) $\left(\frac{\hat{\imath}+\hat{\jmath}}{\sqrt{2}}\right)\frac{QvB}{m}$

(D) $\left(\frac{-\hat{\imath}+\hat{\jmath}}{\sqrt{2}}\right)\frac{QvB}{m}$

25. A cube of side $1\,cm$ and magnetic moment $20 \times 10^{-6} Amp - m^2$ is placed in external magnetic field 50×10^{-6} Tesla. Then magnetic susceptibility of material is:

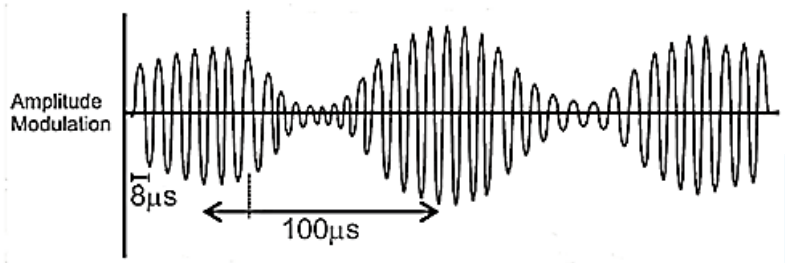
(A) 0.5

(B) 0.6

(C) 0.05

(D) 0.4

26. In the figure an $A.M.$ wave is shown. If the peak maximum and minimum voltages during $A.M.$ transmission be $10\,mV$ and $8mV$ respectively, then the equation of $A.M.$ is



(A) $\{9 + \sin(2\pi \times 10^4)t\} \times \sin(2.5\pi \times 10^6 t)\ mV$

(B) $\{9 + \sin(2\pi \times 10^4)t\} \times \sin(5\pi \times 10^6 t)\ mV$

(C) $\{9 + \sin(4\pi \times 10^4)t\} \times \sin(2.5\pi \times 10^6 t)\ mV$

(D) $\{9 + \sin(4\pi \times 10^4)t\} \times \sin(5\pi \times 10^6 t)\ mV$

27. If velocity acceleration and force are fundamental quantities find dimension of youngs modulus

(A) $v^{-2}a^{-4}F^2$

(B) $v^{-4}a^2F^1$

(C) $v^2a^{-4}F^1$

(D) None

Chemistry

1. $2X \rightarrow Y$ is zero order reaction. Initial concentration of X is $0.2\ M$ and half life is 6 hr. Calculate time required to change the concentration of X from $0.5M$ to $0.2M$
   (A) 18 hr
   (B) 12 hr
   (C) 9 hr
   (D) 7 hr

2. A complex $K_2[HgI_4]$ has $\alpha = 40\%$. What be it's Van't hoff factor?
   (A) 1.8
   (B) 2
   (C) 2.2
   (D) 0.8

3. Which of the following order of E.N. is correct according to Pauling scale.
   (A) $Al < Si$
   (B) $Ga < Ge$
   (C) $Sc < Ti$
   (D) $P > S$

4. Which order is correct for stability of +1 oxidation state?
   (A) $Al < Ga < In < Tl$
   (B) $Al > Ga > In > Tl$
   (C) $Al < Ga < Tl < In$
   (D) $Al > Ga > Tl > In$

5. Find the dispersed phase and the dispersion medium in the following colloids: Cheese (C), Milk (M) and Smoke (S).
   (A) C; liquid in solid M; liquid in liquid S; solid in gas
   (B) C; liquid in liquid M; liquid in solid S; gas in solid
   (C) C; solid in gas M; liquid in liquid S; solid in liquid
   (D) C; solid in liquid M; solid in solid S; liquid in solid

6. $Cu + 2Ag^+ \rightarrow Cu^{2+} + 2Ag; K_c = 1.0 \times 10^{16}$ find out E^o_{cell}
   (A) $0.4728\ V$
   (B) $0.9263\ V$
   (C) $0.0728\ V$
   (D) $1.9836\ V$

7. Which of the following is not electron deficient?
   (A) SiH_4
   (B) AlH_3
   (C) B_2H_6
   (D) GaH_3

8. What is the Co-ordination number of the Th in $K_4[Th\ (C_2O_4)_4(OH)_2]$
   (A) 9
   (B) 6
   (C) 14
   (D) 10

9. Calculate ΔG^o for following reaction $2H_2O \rightleftharpoons H_3O^+ + OH^-$ at $298\ K$.
(A) $+100\frac{kJ}{mol}$
(B) $-100\frac{kJ}{mol}$
(C) $-80\frac{kJ}{mol}$
(D) $+80\frac{kJ}{mol}$

10. Math correct combination

Column-I		**Column-II**	
(A)	$MgHCO_3$	(P)	Port land cement
(B)	Dicalcium Silicate Ca_2SiO_4	(Q)	Solvay process
(C)	$NaOH$	(R)	Temporary Hardness
(D)	$Na_2CO_3 10H_2O$	(S)	Castner-Kellner cell

(A) $A \to R \quad B \to P \quad C \to S \quad D \to Q$
(B) $A \to P \quad B \to Q \quad C \to R \quad D \to S$
(C) $A \to S \quad B \to P \quad C \to R \quad D \to Q$
(D) $A \to Q \quad B \to R \quad C \to S \quad D \to P$

11. For reaction, $\Delta H = 491.1\ kJ/mol$ & $\Delta S = 198\ J/mol$. At which temperature reaction will the reaction be feasible?
(A) $2386\ K$
(B) $2476\ K$
(C) $2481\ K$
(D) $1573\ K$

12. In hydrogen atom, for an electron undergoing a transition form M to L the wavelength of photon is λ then if electron undergoing transition from $N \to L$ the wavelength will be
(A) $\frac{20}{27}\lambda$
(B) $\frac{25}{27}\lambda$
(C) $\frac{27}{20}\lambda$
(D) $\frac{32}{33}\lambda$

13. $25\ mL$ of HCl is titration with $30\ mL$ of $0.1M\ Na_2CO_3$. How many ml of the same HCl solution will be consumed when it reacts with $30\ mL$ $0.2\ M\ NaOH$?
(A) $25\ mL$
(B) $50\ mL$
(C) $75\ mL$
(D) $100\ mL$

14. Which of the following is not a calcination reaction?
(A) $Cu_2S + O_2 \to Cu_2O + 2SO_2$
(B) $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$
(C) $Fe_2O_3.2H_2O \xrightarrow{\Delta} Fe_2O_3 + 2H_2O$
(D) $ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2$

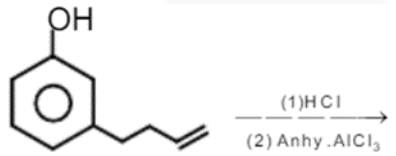
15. A photon of frequency v is incident on metal having threshold frequency v_0 which of the following is correct regarding de-broglie' wavelength emitted by electron?
(A) $\lambda \propto \frac{1}{(v-v_0)^{3/2}}$
(B) $\lambda \propto \frac{1}{(v-v_0)^{1/2}}$
(C) $\lambda \propto (v-v_0)^{3/2}$
(D) $\lambda \propto (v-v_0)^{1/2}$

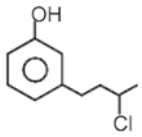
16. For a chemical reaction $\Delta G = A - BT$, which of the following is correct
(A) If $A > 0$ then reaction is endothermic
(B) If $B < 0$ then reaction is exothermic
(C) If $A < 0, B > 0$ then reaction is endothermic
(D) If $A > 0, B < 0$ then reaction is exothermic

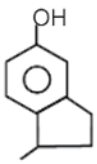
17. How many bridging carbonyl and number of $Co - Co$ bond in $CO_2(CO)_8$
(A) $4, 0$
(B) $2, 0$
(C) $2, 1$
(D) $4, 1$

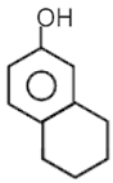
18. $A + KOH + O_2 \rightarrow B(\text{green}) \overset{H^+}{\rightleftharpoons} C$ (purple) $\xrightarrow{Kl+KOH} A + D$
Identify A and D.
(A) MnO_2, KIO_3
(B) K_2MnO_4, I_2
(C) $KMnO_4, KIO_3$
(D) MnO_2, I_2

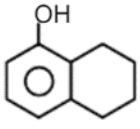
19.



(A) 

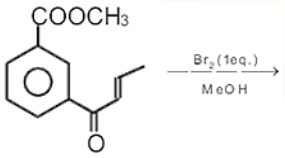
(B) 

(C) 

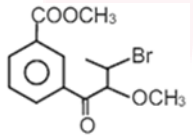
(D) 

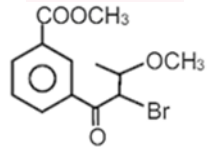
20. Tajmahal is being corroded by
(A) Acid rain
(B) Soil pollution
(C) Air pollution
(D) Water pollution

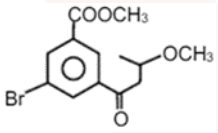
21. Which of the following gas in air is responsible for the stiffness of flower buds?
(A) SO_2
(B) NO_2
(C) CO_2
(D) CO

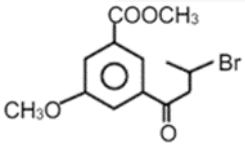
22. 

Product is

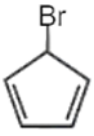
(A) 

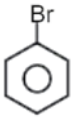
(B) 

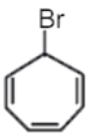
(C) 

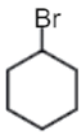
(D) 

23. Which of the following gives a yellow precipitate with $AgNO_3$?

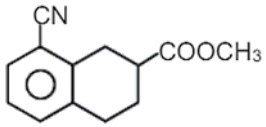
(A) 

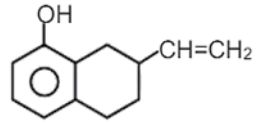
(B) 

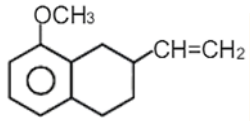
(C) 

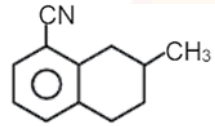
(D) 

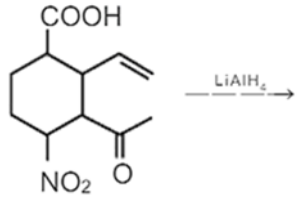
24. Which of the following compound can react with ethylmagnesium bromide and decolorise Br_2/H_2O ?

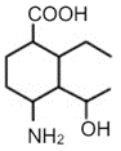
(A) 

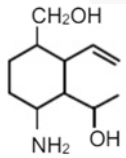
(B) 

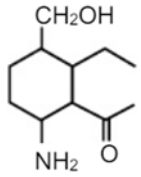
(C) 

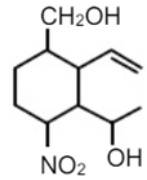
(D) 

25. 

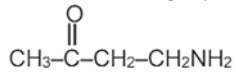
(A) 

(B) 

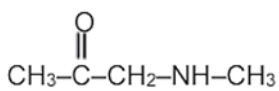
(C) 

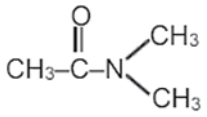
(D) 

26. $A \xrightarrow{Br_2+NaOH} B(C_3H_9N) \rightarrow$ Carbyl amine test positive compound A is:

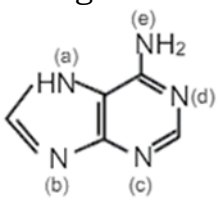
(A) 

(B) $CH_3CH_2CH_2CONH_2$

(C) 

(D) 

27. In which of the following structure protonation takes place easily at which nitrogen:



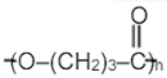
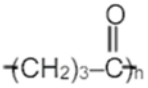
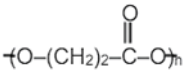
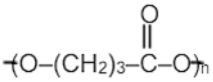
(A) a only
(B) c only
(C) a and b
(D) b, c and e

28. Math correct combination

Column-I		Column-II	
(A)	Ester test	(P)	(Tyr)
(B)	Carbyl amine test	(Q)	(Asp)
(C)	Phthalein test	(R)	(Lys)
		(S)	(Ser)

(A) $A \to P \quad B \to Q \quad C \to S$
(B) $A \to Q \quad B \to R \quad C \to P$
(C) $A \to R \quad B \to S \quad C \to Q$
(D) $A \to S \quad B \to Q \quad C \to R$

29. Which of the following homopolymer of 4 –hydroxy butanoic acid?

(A) 
(B) 
(C) 
(D) 

30. Correct matching is

Column-I		Column-II	
(A)	Allosteric site	(P)	These bind to a different site of eneyme
(B)	Poison	(Q)	It binds to the active site
(C)	Receptor	(R)	It bind at active side by covalent bond
(D)	Competitive inhibitor	(S)	Important for communication

(A) $A \to P \quad B \to R \quad C \to S \quad D \to Q$
(B) $A \to R \quad B \to P \quad C \to Q \quad D \to S$
(C) $A \to S \quad B \to R \quad C \to Q \quad D \to P$
(D) $A \to Q \quad B \to R \quad C \to S \quad D \to P$