

**RSAT-2019 Examination Model Paper for
ENGINEERING & TECHNOLOGY**

- 1) If $f(x) = \begin{vmatrix} \cos 2x & \sin^2 x & \cos 4x \\ \sin^2 x & \cos 2x & \cos^2 x \\ \cos 4x & \cos^2 x & \cos 2x \end{vmatrix}$ is expanded in powers of $\sin x$ then the constant term in the expansion is _____
 1) 1 2) 2 3) -1 4) -2
- 2) Let $f: R \rightarrow R$ be such that $f(x) = \begin{cases} \frac{\sin(a+1)x + \sin x}{x} & \text{for } x < 0 \\ c & \text{for } x = 0 \\ \frac{(x+bx^2)^{1/2} - x^{1/2}}{bx^{3/2}} & \text{for } x > 0 (b \neq 0) \end{cases}$
 where $b \neq 0$. Then find the value of $(a+3c)$, if $f(x)$ is continuous at $x=0$
 1) 2 2) -1 3) 1 4) 0
- 3) The equation of the plane that passes through the point $(2,1,0)$ and is perpendicular to the planes $2x - y - z = 5$ and $x+2y-3z = 5$, is _____
 1) $x - y + z = 1$ 2) $2x+y-z=5$ 3) $x-y-z=1$ 4) $x+y+z=3$
- 4) If p, q are real numbers such that the sum of the roots of the quadratic $x^2 + px + q = 0$ is three times the difference between the roots. Then it must follow that _____
 1) $4p^2 = 9q$ 2) $2p^2 = 9q$ 3) $2p = 9q$ 4) $p^2 = 4q$
- 5) In a standard ellipse, length of minor axis is $4\sqrt{2}$, and $CF = FA$ where C is its centre, F is a focus and A is the corresponding end of major axis. Then the length of major axis is _____
 1) $8\sqrt{2}$ 2) $2\sqrt{6}$ 3) $\frac{8\sqrt{2}}{3}$ 4) $\frac{8\sqrt{2}}{\sqrt{3}}$
- 6) If complex numbers z_1, z_2 vary such that $|z_1| = 12$ and $|z_2 - 3 - 4i| = 5$, then the least possible value of $|z_1 - z_2|$ is _____
 1) 0 2) 2 3) 7 4) 17
- 7) Let $a, b, c \in R$. If the equations $ax^2+bx+c=0$ and $x^3+3x^2+3x+2=0$ have common roots, then
 1) $4a - 2b + c = 0$ 2) $a = b = c$ 3) $4a + 2b + c = 0$ 4) $a : b : c = 1 : 2 : 1$
- 8) Number of roots of the equation $e^{x-1} + x - 3 = 0$ in the interval $(1,2)$ is _____
 1) 0 2) 2 3) 3 4) 1

9) The vectors $\vec{a} = 3\hat{i} + \hat{j} - 2\hat{k}$, $\vec{b} = -\hat{i} + 3\hat{j} + 4\hat{k}$, $\vec{c} = 4\hat{i} - 2\hat{j} - 6\hat{k}$ are along the sides of a triangle. The length of the median bisecting the vector \vec{c} is

- 1) $\sqrt{10}$ 2) $\sqrt{8}$ 3) $\sqrt{11}$ 4) $\sqrt{6}$

10) The distance of the point $P(1, -2, 3)$ from the plane $x - y + z = 5$ measured along the direction parallel to the line $\frac{x}{2} = \frac{y}{3} = \frac{z}{-6}$, is _____ units.

- 1) 2 2) 1 3) $\frac{1}{7}$ 4) $\frac{8}{7}$

11) The area of the region enclosed by $0 \leq x \leq e^2$, $y \geq 0$, $y^2 \leq 4x$, $xy \leq 4\sqrt{2}$ is ____ square units.

- 1) $\frac{32\sqrt{2}}{3} - 4\sqrt{2} \ln 2$ 2) $\frac{32\sqrt{2}}{3} - 2\sqrt{2} \ln 2$ 3) $\frac{28\sqrt{2}}{3} - 4\sqrt{2} \ln 2$ 4) $\frac{32\sqrt{2}}{2} - 4\sqrt{2} \ln 2$

12) $(7n+1):(4n+17)$. Then the ratio of their 10th terms must be 134 : 93.

Statement-II: If $S_n = an^2 + bn + c$, then $T_n = S_n - S_{n-1}$

(Where S_n is sum of n terms and T_n is the n th term).

- (a) Statement-I is true; statement-II is true; statement-I is a correct explanation for statement-I
 (b) Statement-I is true; statement-II is true; statement-I is not a correct explanation for statement-I
 (c) Statement-I is true; statement-II is false
 (d) Statement-I is false; statement-II is false

Statement-I: The sums of first n terms of two arithmetic progressions are in the ratio

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

13) A standard ellipse touches the lines $x + y = 4$ and $x - y = 4$. Distance between the foci of the ellipses $2\sqrt{6}$. Then the area of the ellipse is ____ square units.

- 1) $\sqrt{55}\pi$ 2) $5\sqrt{2}\pi$ 3) $\sqrt{66}\pi$ 4) $2\sqrt{11}\pi$

14)

$$\text{If } f(x) = \begin{cases} \sin \{ \cos x \}, x \neq \frac{\pi}{2} \\ x - \left(\frac{\pi}{2} \right) \\ 1, x = \frac{\pi}{2} \end{cases}$$

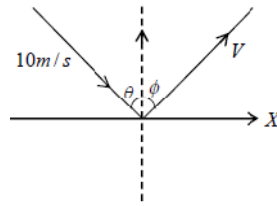
where $\{.\}$ represents fractional part function, then ____

- 1) $f(x)$ is continuous at $x = \frac{\pi}{2}$
 2) $\lim_{x \rightarrow \frac{\pi}{2}} f(x)$ exists, but $f(x)$ is not continuous at $x = \frac{\pi}{2}$
 3) $\lim_{x \rightarrow \frac{\pi}{2}} f(x)$ does not exist
 4) $\lim_{x \rightarrow \frac{\pi}{2}} f(x) = 1$

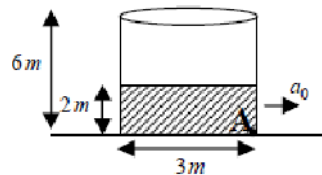
- 15) If $f(x) = \cot^{-1}\left(\frac{x^x - x^{-x}}{2}\right)$, then $f'(1) =$
- 1) -1 2) 1 3) $\log_e 2$ 4) $-\log_e 2$
- 16) A family of straight lines is given by $(3x+4y+6)+\lambda(x+y+2)=0$, where λ is a real parameter. The point P (2, 3) is farthest from which member of the given family of straight lines:
- 1) $4x+3y+8=0$ 2) $4x+5y+8=0$ 3) $2x+3y+4=0$ 4) None of the above lines.
- 17) Let A, B be two sets such that $n(A)=4$ and $n(B)=6$. Then the least possible number of elements in the power set of $A \cup B$ is _____
- 1) 16 2) 64 3) 256 4) 1024
- 18) The area of the region that lies inside the parabola $5x^2 - y = 0$ but outside the parabola $2x^2 - y + 9 = 0$ is _____ sq.units
- 1) $12\sqrt{3}$ 2) $6\sqrt{3}$ 3) $18\sqrt{3}$ 4) $4\sqrt{3}$
- 19) Suppose A and B are two non – singular matrices of same order such that $AB = BA^2$ and $B^5 = I$. Then it must happen that _____
- 1) $A^{32} = I$ 2) $A^{31} = I$ 3) $A^{30} = I$ 4) $A^{50} = I$
- 20) If $p(x) = 1 - x + x^2 - x^3 + \dots + x^{16} - x^{17}$, then the coefficient of x^2 in the polynomial $q(x) = p(x-1)$, is _____
- 1) 1 2) $-{}^{18}C_2$ 3) $-{}^{18}C_3$ 4) ${}^{18}C_3$
- 21) The least possible distance between points on the curves, $y^2 - 4x - 8y + 40 = 0$ and $x^2 - 8x - 4y + 40 = 0$ is _____ units.
- 1) 0 2) $\sqrt{3}$ 3) $2\sqrt{2}$ 4) $\sqrt{2}$
- 22) If $f(x) = |1-x|$, then the set of all points where $g(x) = \sin^{-1} f(|x|)$ is not differentiable, is _____
- 1) $\{0,1\}$ 2) $\{0,-1\}$ 3) $\{0,1,-1\}$ 4) $\{1,-1\}$
- 23) $a f(x+1) + b f\left(\frac{1}{x+1}\right) = x$, for all $x (\neq -1) \in \mathbb{R}$, where a, b are real constants, $a^2 \neq b^2$.
Then $f(2) =$ _____
- 1) $\frac{2a+b}{2(a^2-b^2)}$ 2) $\frac{2a+b}{a^2-b^2}$ 3) $\frac{a+2b}{a^2-b^2}$ 4) 0
- 24) R is a relation defined on the set of integers Z as follows : $x R y$ iff $x^2 y \geq 0$.
Then the relation R _____
- 1) is reflexive but is not symmetric
2) is not reflexive but is symmetric
3) is not reflexive, not symmetric but is transitive
4) is not reflexive, not symmetric and not transitive

- 25) The mean and variance of x_1, x_2, x_3, x_4, x_5 are 3 and 2 respectively while the mean and variance of y_1, y_2, y_3, y_4, y_5 are 5 and 4 respectively. Then the standard deviation of the combined set of values $x_1, x_2, x_3, x_4, x_5, y_1, y_2, y_3, y_4, y_5$ is _____
- 1) 2 2) $\sqrt{6}$ 3) $\sqrt{8}$ 4) 4
- 26) If $x > 0$, then $\int \frac{x^2 - 1}{x^3 \sqrt{2x^4 - 2x^2 + 1}} dx = \text{_____} + c$
- 1) $\frac{\sqrt{2x^4 - 2x^2 + 1}}{2x}$ 2) $\frac{\sqrt{2x^4 - 2x^2 + 1}}{2x^3}$ 3) $\frac{\sqrt{2x^4 - 2x^2 + 1}}{x^2}$ 4) $\frac{\sqrt{2x^4 - 2x^2 + 1}}{2x^2}$
- 27) Six persons A, B, C, D, E, F attend a round-table discussion in a room in which there are 8 identical chairs arranged along the circumference of the circular table. The total number of ways in which the six persons can take seats such that A and B sit next to each other, E and F do not sit next to each other while two chairs are left vacant, is _____
- 1) 240 2) 480 3) 600 4) 720
- 28) Which of the following proposition is a tautology?
- 1) $\sim(p \Rightarrow q) \vee p \wedge \sim q$ 2) $(p \Rightarrow q) \Rightarrow (p \wedge \sim q)$
3) $(p \Rightarrow q) \vee (p \wedge \sim q)$ 4) $(p \Rightarrow q) \wedge (p \wedge \sim q)$
- 29) The curve $y = ax^3 + bx^2 + cx$ is inclined at an angle of 45° to the x -axis at $(0, 0)$, while it touches the x -axis at $(1, 0)$. Then the values of a, b, c are given by:
- 1) $a = 2, b = 1, c = 1$ 2) $a = 1, b = -2, c = 1$
3) $a = 1, b = 1, c = 2$ 4) $a = 1, b = 2, c = 1$
- 30) A bag contains 'n' coins of which five of them are counterfeit with heads on both sides and the rest are fair coins. The probability of getting head when a coin is selected at random and tossed is $\frac{5}{8}$. Then the probability that the selected coin is a fair coin is _____
- 1) $\frac{2}{5}$ 2) $\frac{3}{5}$ 3) $\frac{7}{10}$ 4) $\frac{3}{8}$
- 31) A wire of uniform linear density is bent in the form of a circle of radius r . The moment of inertia of the circle about an axis along its tangent and perpendicular to its plane is I_1 . Now the same material wire is used to form a square of side length a . The moment of inertia of the square about an axis in the plane and along one of the sides is I_2 . The value of $\frac{I_1}{I_2}$ is equal to
- 1) $\frac{12\pi r^3}{5a^2}$ 2) $\frac{3r^3\pi}{5a^3}$ 3) $\frac{12r^3\pi}{5a^3}$ 4) $\frac{6r^3\pi}{5a^3}$
- 32) During the regulation action of a Zener diode,
- 1) the current in the Zener Diode and voltage across the Zener diode remain constant.
2) The current through the resistance in series with the zener diode changes.
3) The Zener diode resistance is constant.
4) The resistance offered by the Zener diode does not change.

- 33) A particle moving with a speed of 10 ms^{-1} along the straight line $4x + 3y = 12$ on the smooth horizontal XY plane hits a smooth vertical wall fixed in the X-Z plane. If the coefficient of restitution for the collision is $\frac{3}{4}$, the speed of the particle after the collision will be



- 1) $5\sqrt{2} \text{ m/s}$ 2) 5 m/s 3) $6\sqrt{2} \text{ m/s}$ 4) 8 m/s
- 34) The magnetic induction at two points on the axis of a circular coil at distances of 0.05m and 0.2m from the centre are in the ratio 8 : 1. The radius of the coil is
 1) 1.0m 2) 0.1m 3) 0.15m 4) 0.2m
- 35) The electrostatic potential at a point P (x, y, z) is represented by $V(x, y, z) = 6x - 8xy - 8y + 6yz$ where V is in volts and x, y, z are in metres. The magnitude of electric force experienced by a point charge of 2 coul when placed at the point B (1, 1, 1) is
 1) $6\sqrt{5} \text{ N}$ 2) 30 N 3) 24 N 4) $4\sqrt{35} \text{ N}$
- 36) An open tank of water of height 6m has water filled up to a height 2m. The minimum horizontal acceleration a_0 of the tank for the pressure at the point A inside the tank (as shown) to be equal to that of atmosphere pressure is



- 1) $\frac{3g}{2}$ 2) $\frac{4g}{3}$ 3) $2g$ 4) $\frac{3g}{4}$
- 37) Photons of linear momentum $\frac{2h}{\lambda_0}$ ($h \rightarrow$ Plank's constant) incident on the surface of a metal. If the threshold wave length for the emission of photo electrons is λ_0 , the stopping potential for the photo electrons will be
 1) $\frac{hc}{2e\lambda_0}$ 2) $\frac{2hc}{e\lambda_0}$ 3) $\frac{hc}{e\lambda_0}$ 4) $\frac{3hc}{2e\lambda_0}$
- 38) The maximum efficiency of a heat engine when working between the temperatures of the source and the sink among the following combinations is
 1) 100 K, 80 K 2) 40 K, 20 K 3) 60 K, 40 K 4) 120 K, 100 K
- 39) Two mercury droplets of radii r and $r(7)^{\frac{1}{3}}$ coalesce into one single drop under isothermal conditions. If S is the surface tension of mercury, the energy released in this process is
 [Take $(49)^{\frac{1}{3}} = 3.66$]
 1) $16\pi r^2 S$ 2) $2.6\pi r^2 S$ 3) $3.66\pi r^2 S$ 4) $14.64\pi r^2 S$

- 50) In the arrangement shown, all plates have equal area. The amount of spacing between the plates is as mentioned. Find the equivalent capacitance of the system between the plates A and B if

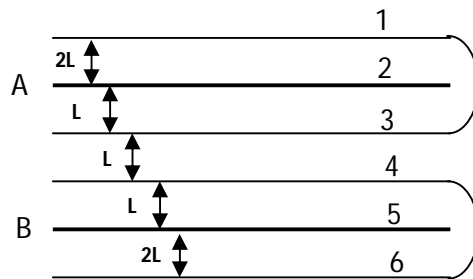
$$C = \frac{\epsilon_0 A}{L}$$

1) $\frac{5}{7}C$

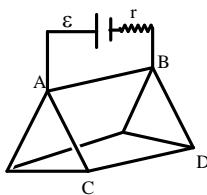
2) $\frac{3}{7}C$

3) $\frac{1}{7}C$

4) $\frac{2}{7}C$



- 51)



A prism skeleton is formed using '9' identical straight wires each of resistance 'R'. A cell of emf 'ε' and internal resistance 'r' is connected across the points A and B. The skeleton is chosen such that maximum power gets dissipated in it. If the total power produced in the circuit is P, the thermal power produced in the wire CD will be

1) $\frac{P}{15}$

2) $\frac{2P}{15}$

3) $\frac{P}{10}$

4) $\frac{P}{30}$

- 52) Choose the correct option regarding susceptibility 'X' and relative permeability ' μ_r ' of the substances referred.

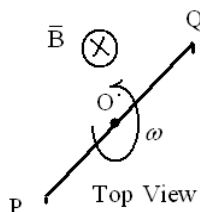
1) Copper metal has $X > 0, \mu_r > 1$

2) Aluminium metal has $X > 1, \mu_r < 1$

3) Nickel metal has $X \gg 1, \mu_r < 1$

4) Oxygen gas at STP has $X > 0, \mu_r > 1$

- 53) A straight horizontal conductor PQ of length ' ℓ ' can rotate frictionless about a vertical axle, which goes through its centre (top view is shown in figure). The two ends (which have a slight projections) of the conductor are immersed in mercury tank in which the drag force exerted on the ends of the wire is KV^2 , where K is a constant and 'V' is the velocity of the ends of the rod, the system is in a uniform vertical magnetic field of induction 'B'. A constant current I is made to flow through mercury tank and the axle into the rod. Neglect Ohmic resistances and air drag. The angular speed of the wire 'ω' is



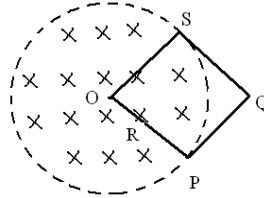
1) $\sqrt{\frac{BI}{K\ell}}$

2) $\sqrt{\frac{2BI}{K\ell}}$

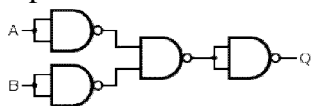
3) $\sqrt{\frac{BI}{2K\ell}}$

4) $2\sqrt{\frac{BI}{K\ell}}$

- 54) A cylindrical region contain a spatially uniform but time varying magnetic field that varies as $B(t) = at^2$, where $a = 10 \text{ T/s}^2$ and is directed into the plane of the paper. A square metallic wire frame OPQS having side length equal to radius 'R' of the cylindrical region is placed with its plane perpendicular to the field. If $R = \frac{1}{\sqrt{\pi}} \text{ m}$ and the resistance per unit length of the wire frame is $\lambda = 2\Omega/\text{m}$, find the magnetic force acting on square frame at $t = 2 \text{ sec}$ when the magnetic field is switched on at time $t = 0$



- 1) 50 N 2) $50\sqrt{2} \text{ N}$ 3) 100 N 4) $100\sqrt{2} \text{ N}$
- 55) An electro magnetic wave when incident normally on a perfectly reflecting surface is found to exert a radiation pressure of 4 mPa on the surface. If speed of e.m.wave is $3 \times 10^8 \text{ m/s}$ then the amplitude of electric field vector (E) of the e.m. wave will be (given permittivity of free space $= 8.8 \times 10^{-12} \text{ C}^2 / \text{Nm}^2$)
- 1) $2.12 \times 10^4 \text{ N/C}$
 2) $674 \times 10^4 \text{ N/C}$
 3) $8.52 \times 10^4 \text{ N/C}$
 4) $10.65 \times 10^3 \text{ N/C}$
- 56) A horizontally oriented thin copper rod of length ℓ is rotated about vertical axis passing through its middle. The breaking stress of copper is σ and density is ρ . The frequency of rotation at which this rod just ruptures is
- 1) $\sqrt{\frac{\sigma}{\rho\pi^2\ell^2}} \text{ rpm}$ 2) $\sqrt{\frac{\sigma}{2\pi^2\rho\ell^2}} \text{ rps}$ 3) $\sqrt{\frac{2\sigma}{\pi^2\rho\ell^2}} \text{ rps}$ 4) $\sqrt{\frac{3\sigma}{2\pi^2\rho\ell^2}} \text{ rpm}$
- 57) A moving neutron collides with another singly ionized helium atom in ground state at rest and free to move. The minimum kinetic energy of the moving neutron for the collision to be perfectly inelastic is
- 1) 31 eV 2) 30.8 eV 3) 21.6 eV 4) 40.8 eV
- 58) The amount of ${}^{210}_{84}\text{Po}$ necessary to provide a source of α -particles of 10 millicurie strength is approximately (Half life of ${}^{210}_{84}\text{Po}$ is 138 days)
- 1) $0.22 \mu\text{g}$ 2) $2.22 \mu\text{g}$ 3) $22.2 \mu\text{g}$ 4) $222 \mu\text{g}$
- 59) Four NAND gates are used in the figure shown. Which equivalent logic gate does the figure represent?



- 1) OR-gate 2) AND-gate 3) NOR-gate 4) NAND-gate

- 70) For a reaction in which A and B form products, the following data were obtained from three experiments

Expt	[A] in mole L ⁻¹	[B] in mole L ⁻¹	Rate in mole L ⁻¹ s ⁻¹
1	0.01	0.01	5×10^{-3}
2	0.02	0.01	1×10^{-2}
3	0.02	0.02	4×10^{-2}

Then the value of rate constant for the reaction $A + B \rightarrow \text{products}$ is

- 1) $5 \times 10^3 \text{ mole}^{-2} \text{L}^2 \text{S}^{-1}$ 2) $50 \text{ mole}^{-1} \text{LS}^{-1}$
3) $5 \times 10^{-1} \text{S}^{-1}$ 4) $5 \times 10^{-3} \text{ mole L}^{-1} \text{S}^{-1}$
- 71) The conductivity of a saturated solution of BaSO_4 is $3.06 \times 10^{-6} \text{ ohm}^{-1} \text{cm}^{-1}$ and its equivalent conductance is $1.53 \text{ ohm}^{-1} \text{cm}^2 \text{equiv}^{-1}$. The K_{sp} for BaSO_4 will be
1) 16×10^{-12} 2) 3.2×10^{-8} 3) 2.0×10^{-3} 4) 4×10^{-6}
- 72) The edge length of the unit cell of a body centred cubic lattice of a metal is 352pm. The radius of the metal atom is
1) 152.4pm 2) 124.5pm 3) 176pm 4) 203.2pm
- 73) Choose the correct statement
1) Lyophilic sol. can be coagulated by adding excess of electrolyte
2) Viscosity of lyophobic sol. is more than that of disperse medium
3) Higher the gold number of lyophilic sol. more is its protective power
4) Gases with higher critical temperature will adsorb less
- 74) $\text{PbS} + \text{H}_2\text{O}_2 \longrightarrow \text{PbSO}_4 + \text{H}_2\text{O}$. In this reaction the number of moles of H_2O_2 required to react with one mole of PbS are
1) 4 2) 2 3) 3 4) 1
- 75) Coloured & Paramagnetic gas which can undergo dimerization easily is,
1) NO 2) NO_2 3) ClO_2 4) SO_2
- 76) Which of the following statement is incorrect?
1) In an addition compound of $[\text{BF}_3 : \text{NH}_3]$, both B and N are sp^3 hybridized
2) H_3BO_3 is a weak monobasic acid
3) Diborane (B_2H_6) undergoes unsymmetrical cleavage in presence of NH_3
4) Aqueous solution of Borax is acidic in nature
- 77) When XeF_4 reacts with water one of the products is HF. The other product(s) is/are
1) Xe 2) XeO_3 3) O_2 4) All
- 78) Which of these complex compounds exhibit both ionization and linkage isomerism?
1) $[\text{Co}(\text{NH}_3)_4 \text{Cl}_2] \text{Br}$ 2) $[\text{Co}(\text{NH}_3)_5(\text{NO}_2)] \text{Cl}_2$
3) $\text{K}_3[\text{CrCl}_2(\text{ox})_2]$ 4) $[\text{Co}(\text{NH}_3)_5 \text{SO}_4] \text{Br}$
- 79) The complex showing a spin only magnetic moment of 2.82 B.M.?
1) $[\text{Ni}(\text{CO})_4]$ 2) $[\text{NiCl}_4]^{2-}$ 3) $[\text{Ni}(\text{PPh}_3)_4]$ 4) $[\text{Ni}(\text{CN})_4]^{2-}$

- 80) Choose the incorrect statement regarding Lanthanides.
- 1) Their common oxidation state +3
 - 2) Colour exhibited by species with f^n configuration is generally similar to those with f^{14-n} configuration
 - 3) Ce^{4+} is a good reducing agent:
 - 4) Yb^{2+} is diamagnetic

81) Cation which is not precipitated by H_2S neither in acidic medium nor in basic medium?

- 1) Bi^{3+} 2) Pb^{2+} 3) Ba^{2+} 4) Mn^{2+}

82) Metal Refining Process

- | | |
|-----------|---------------------|
| 1) Ni | p) Mond's Process |
| 2) Zr | q) Van Arkel method |
| 3) Si, Ge | r) Zone refining |
| 4) Ag | s) Cupellation |

In above which represents correct set

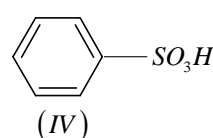
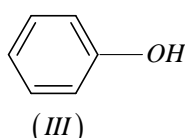
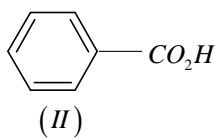
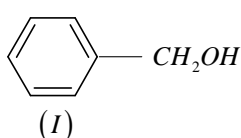
- 1) Only 1 & 2 2) Only 2 & 3 3) Only 1 & 4 4) All 1, 2, 3 & 4

83) Choose the correct statement

- I) Glycine is optically inactive
- II) Proline does not give Ninhydrin test
- III) Tripeptide contains three amino acids
- IV) Neutral amino acids exist as anions above P^I (iso-electric point)

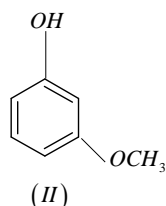
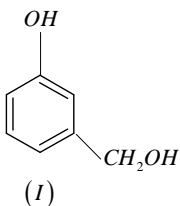
- 1) I & II 2) I, II & III 3) III & IV 4) I, II, III & IV

84) The order of acidity of compounds I-IV, is-



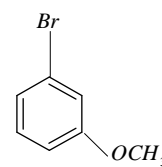
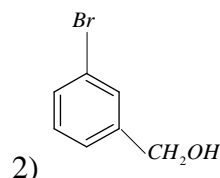
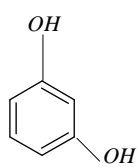
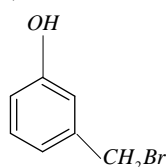
- 1) $I < III < II < IV$ 2) $IV < I < II < III$
 3) $III < I < II < IV$ 4) $II < IV < III < I$

85) Two isomeric compounds I and II are heated with HBr -

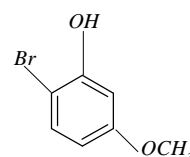
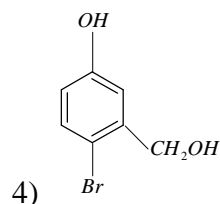
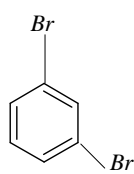
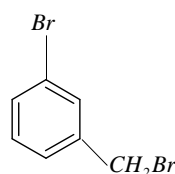


The products obtained are

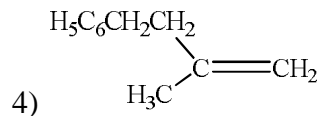
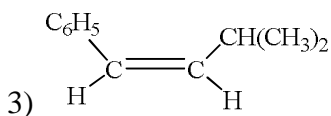
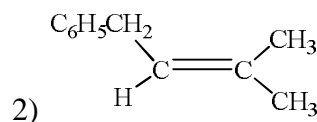
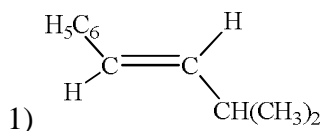
1)



3)



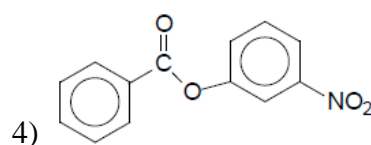
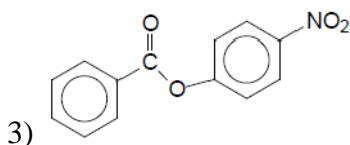
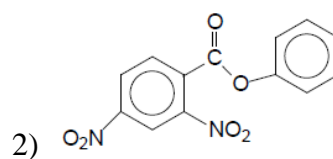
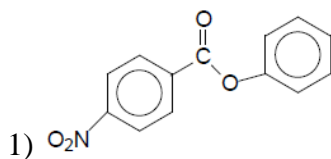
86) The main product of the following reaction is $C_6H_5CH_2CH(OH)CH(CH_3)_2 \xrightarrow{\text{conc. } H_2SO_4}$



87) In Williamson's synthesis of ethers, which one of the following is not used

- 1) Ethyl bromide
- 2) Tert butylchloride
- 3) Sodium Ethoxide
- 4) Sodium tert butoxide

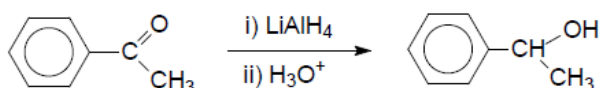
88) The major product of nitration of $C_6H_5 - COO - C_6H_5$ with conc. HNO_3 / H_2SO_4 mixture is:



89) Which of the following is incorrect?

- 1) Nylon-2, Nylon-6 : Condensation, Co-polymer
- 2) Bu Na-S: Addition, Co polymer
- 3) Nylon 6,10: Condensation, homo polymer
- 4) Terylene: Condensation, Co polymer

90) In the reaction



The reaction and the products are

- 1) Addition, optically active
- 2) Substitution, optically active
- 3) Addition, Racemic mixture
- 4) Reduction, optically active