

# E-CAT 2011(DIFFICULT ONE)

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**NOTE:** As it is already informed to all of you that this stuff is not well organized because it's not official, but I assure you that it can give you an idea about last year's ECAT difficulty level. I can't help you people more than this. Ignore Errors and omissions. Try to solve it without any assistance and evaluate yourselves, that how much you are prepared for the coming game. Wish you best of luck for the coming days. ☺

## Chemistry

1. Half Life method is used for --- (1st order rxn, 2<sup>nd</sup> order rxn, zero order , integer fraction)
2. CO<sub>2</sub> dry ice has \_\_\_\_\_ types of crystals (molecular , ionic )
3. Aluminium Hydride AlH<sub>3</sub> --- Related Question was asked.
4. Pressure increases on gas, then forces become? ( significant, insignificant)
5. Composition of aqua regia.
6. Lanthanide contraction-Period (Related Question was asked)
7. Trend of Oxidation State
8. Which one of the following is false?
  - a) Copper is softer than sodium
  - b) Diamond is not a conductor
  - c) Cs and Na has same structure
9. e/m of cathode and positive rays
10. H<sub>2</sub>SO<sub>4</sub> in pure form ( dehydrating agent , odorless , conductor of electricity , All )
11. Benzene Stability dependence--- delocalization of  $\pi$  Electrons
12. Distribution Law—Solvent Extraction (ratio of solutes in both solvents)
13. Which one is more Dilute? (1 molar or 1 molal solution of Urea)
14. 9% increase during freezing water is due to ( tetrahedral structure with empty spaces, trihedral with empty spaces)
15. What's the effect on equilibrium---during change in volume?
16. Catalyst disturbs the ( Equilibrium constant, position, none)
17. Electrochemical Series used for ( redox rxns, battery rxns)

18. Depression of freezing point when volatile solute is dissolved in it (related question)
19. In first order rxn, 50% of the substance decays in 1 hour, remaining will decay in?
20. Rate of reaction depends upon surface area (related question)
21. The substance which poison the catalyst?
22. Group 4A elements form (hydride, dioxide, halide)
23. Lithium only form( suboxides, superoxide, oxide, all)
24. Red phosphorus (macro molecule, micro molecule)
25.  $K_2Cr_2O_7$  , oxidation states of all
26. Transition Elements ( All are metals, conductors of heat, variable oxi. State, all)
27. Which of the following react with fehling solution?
28. Enthalpy change---related question
29. An acetal forms—alcohals react aldehydes

### English

- Bread at abroad meat better than home is (arrange this)
- DEmorgue-synonym
- Puntuation
- Passive voice
- Degree: temp (analogue asked)
- Weight: Kilogram
- Baba g chalay UET describes ( One act play, the one act play, a play)
- Necessity is the mother of invention---scientists have discovered many things---when there is a will, there is a way... (mistakes were made in these and was asked to choose the correct one)

### Physics

- Force  $F$  is required to be applied on a body of 1 kg placed on inclined plane at an angle of 30 degree to move it. The force is ( $g$  ,  $g\sqrt{3}$  ,  $g/\sqrt{3}$  ,  $g/\sqrt{2}$ )
- A ball strikes another ball mass 2kg and 1kg at rest with a velocity  $30\text{ms}^{-1}$ . If after the collision the velocities are 20 and  $15\text{ms}^{-1}$  , then  
(it undergo Elastic collision---true option)
- Two satellites  $s_1$  and  $s_2$  are with radius from the Centre of earth of 80,000 and 40,000 then their orbital velocity  $v_1$  and  $v_2$  are ( $\sqrt{2} v_1 = v_2$  ,  $\sqrt{2} v_2 = v_1$  ,  $v_1 = v_2$  , none)

- A body takes a pendulum in the lift and it accelerates upwards the tension in the string (increases, decreases, first increases then decreases, decreases then increases)
- The pressure in a pipe of varying cross sectional area, the pressure at smallest radius portion of it (min, max, none)
- A car approaches  $c_1$  to another car  $c_2$  with a velocity of \_\_\_\_\_. If the apparent frequency of  $c_1$ , when it horns, for  $c_2$  is \_\_\_\_\_. The real frequency is? (the data was given---the type of question was like this)
- In astronomical telescope the final image is formed at (near point, infinity)
- A gas is enclosed in a container fitted with a piston of cross sectional area of  $0.03\text{m}^2$  and pressure is maintained at  $1000\text{Nm}^{-2}$ . When heat is slowly transferred, the piston is pushed up through a distance of 4cm. and 100J heat is transferred to the system then find  $\Delta U$ ?
- In Carnot engine the gas is (expanded isothermally and compressed adiabatically respectively, or other options were there)
- A charge of 100mC passes through a potential difference of 100V of mass 0.1mg, then what is change in velocity?
- When a 500 ohm resistance is replaced by 100 ohm in a cell, effect on terminal voltage?
- Current passing through two wires in same direction (repel, attract)
- A particle passes through the solenoid along the axis, then it will pass along the path (parallel to axis, along spiral path, etc.)
- In RC circuit \_\_\_\_\_ leads the \_\_\_\_\_
- If a bulb and capacitors are connected in series, the current passing is AC, then the bulb will (glow, fused, nothing happens, etc.)
- Transistor is used as (switch---right answer)
- If inputs are different then for NAND gate, the output is?
- A boy named Amir sees a scale placed on earth while he is in aero plane. Then the length of scale will (increased, decreased, same)
- If the speed of body is increased, the mass of body will (increase, decrease, none)
- As the temperature increases, no of longer wavelength radiation (increases, decreases, none)
- When photo electrons are emitted from metal surface then what would be greater than threshold? (intensity, frequency, both, none)
- Davison and Germer experiment proves (wave nature of electron, particle nature of electron, both)
- Laser will produce if the atoms in lower energy states are \_\_\_\_\_ than those in higher energy states. (greater, less, equal, All)

- A flexible loop of wire is lying such that field of lines are parallel to area. If area begins to change then emf induced is (max, zero, both, none)
- In FM , the amplitude of carrier wave is (diminished, increased, both, none)

### Mathematics

- The average value of an even function is (-ve ,+ve, infinite, none)
- The value of the equation  $x^2-x+P$  should be greater than 3 when  $P=?$
- $ax^3-8x+b+6$  is exactly divisible by  $x^2+2x-3=0$  then the value of a and b ?
- $x+2y+2=0$  and  $x^2+y^2=4$  meet at?
- Rank of A is related with ranks of  $AA^t$  (small, equal, same, none)
- Sum of series  $\sum, n=1$  to  $\infty \dots 1/5^n =?$
- After t second, increase in volume is  $5-2/t+1$  then at  $t=3$  rate of increase is?
- $4^{x+1}=2(7-2^x)$  find solution
- If  $f(x) = 2x/x-1$  and x not equal to 1. Then composite function  $ff=f^2$  is infinity at ( 1, -1 and +1 , +2 and -1 , None)
- Find area of  $y=-1+(9/x^2)$  when  $3 \geq x \leq 5$
- $\cos 40 + \cos 100 + \cos 140 = ?$
- $\log_x 5 = 4 \log_5 (X)$  find solution
- $\log_3 (X-1) + \log_3 (X+3) - \log (x+1) = 1$  find solution
- 5 men, 4 girls, not two girls stand together, and then how many ways line can be formed?
- 5 membered committee is to be formed from five couples then how many committees can be formed when men are greater than women?
- A is scalar, X is a column vector, then AX is? (Column vector, etc.)