S. No	General Instructions	Marks
1.	There are total of four sections in the question paper. All questions are compulsory.	
	Section – A contains 10 Objective Type Question/ Multiple choice Question of 1 Mark each	1×10=10 marks
	Section – B contains 9 Very Short Answer Type Question of 2 Marks each to be answered in 20 to 30 words	2×9=18 marks
	Section – C contains 9 Short Answer Type Questions of 3 Marks each to be answered in 100 to 150 words.	3×9= 27 marks
	Section – D contains 3 Long Answer Type Questions of 5 Marks each to be answered in 150 to 200 words.	5×3= 15 marks
2.	Use log tables, if necessary. Use of scientific calculators is not allowed	

SECTION A

Q1. Select the correct one:

(i) The number of water molecules is maximum in

(a)   18 grams of water

(b) 18 moles of water

(c) 18 molecules of water

(d) 1.8 gram of water

(ii) According to Bohr's Theory, the angular momentum of an electron in 5th orbit is

(a)   10 h/π

(b) 2.5 h/π

(c)   25 h / π

(d) 1.0 h / π

(iii)   Identify the least stable ion amongst the following :

(a) Be⁻

(b) Li⁻

(c) B⁻

(d) C⁻

(iv) Which of the following angle corresponds to sp^2 hybridisation ?

(a) 90^0

(b) 180^0

(c) 120^0

(d) $109^0. 28^/$

(v) The volume of gas is reduced to half from its original volume .The specific heat will

(a) reduce to half

(b) be doubled

(c) remains constant

(d) increase four times

(vi) In the reaction $I_2 + I^- \longrightarrow I_3^-$, which is the Lewis base ?

    (a) I_2 (b) I^-

    (c) I_3^- (d) None of these

(vii) In what manner will increase of pressure affect the following equilibrium ?

$$C\,(s) + H_2O\,(g) \rightleftharpoons CO\,(g) + H_2O\,(g)$$

    (a) No effect   (b) Shift in the forward direction

    (c) Shift in the reverse direction   (d) Increase in the field of H_2.

(viii) A Metal on M^{3+} loses 3 electrons, its oxidation number will be

    (a) +3   (b) − 3

    (c) 0   (d) + 6

(ix) The oxidation states of iodine in HIO_4, H_3IO_5 and H_5IO_6 are respectively

    (a) + 1 ,+3,+7   (b) +7 ,+7 ,+3

    (c) +7,+7 ,+7   (d) +7 +5, +3

(x) $:CCl_2$ is

    (a) an electrophile   (b) a free radical

    (c) a nucleophile   (d) none of these .

SECTION B

Q 2. Answer the following questions.

    (I) Write the general electronic configuration of p and d block elements .

    (ii) At 0^0 C, ice and water are present in equilibrium .What will happen on increasing the

        pressure.

    (iii) Define oxidation and reduction according to classical concept.

    (iv) What are Carbocations and Free radicals?

    (v) Give two methods of preparation of Alkanes?

    (vi) Why is benzene extraordinarily stable though it contains three double bonds?

    (vii) Define Inductive effect & Hyper- conjugation .

    (viii) Define

        a) Resonance   b) Ozonolysis

    (ix) Define Sulphonation. Give Example.

Q 3. Answer the following questions.

(i) Discuss law of Reciprocal Proportion with examples.

(ii) An inorganic salt gave the following percentage composition:

$Na = 29.11\%$, $S = 40.51\%$ & $O = 30.38\%$, Calculate the Empirical Formula of the salt.

(iii) Discuss Aufbau's Principle and Hund's Rule.

(iv) What is diagonal relationship with example.

(v) Explain sp^2 hybridization with example.

(vi) On the basis of VSEPR theory, predict the shapes of the following molecules/ ions?

(a) SF_4 (b) NH_4^+ (c) H_3O^+

(d) NH_2 (e) PCl_3 (f) NH_3

(vii) State & explain Hess's Law of constant heat summation.

(viii) What is Buffer Solution. Give its types.

(ix) Give three methods of preparation of Alkynes.

SECTION D

Q 4. Answer the following questions.

(i) What are Quantum numbers? Explain

Or

State and Explain Heisenberg 's Uncertainity Principle.

(ii) Define Ist Law of Thermodynamics. Derive its mathematical formulation.
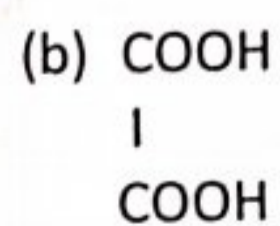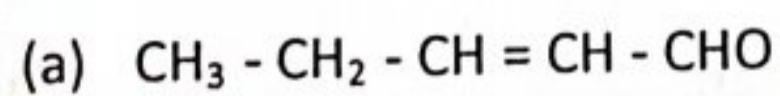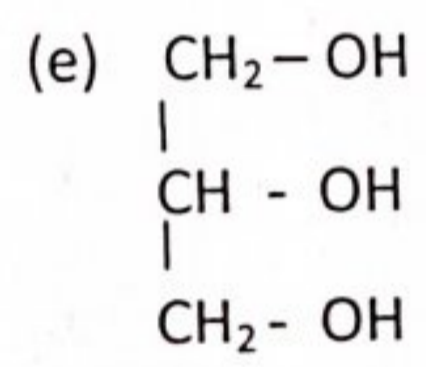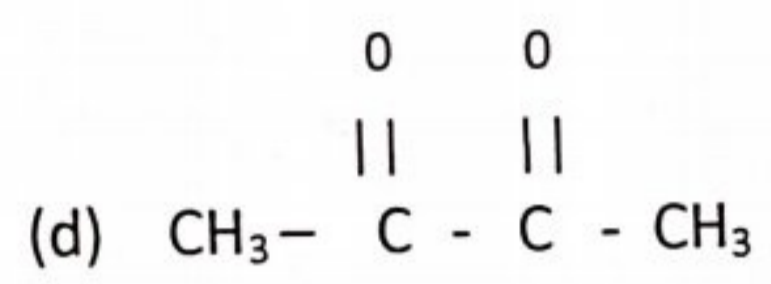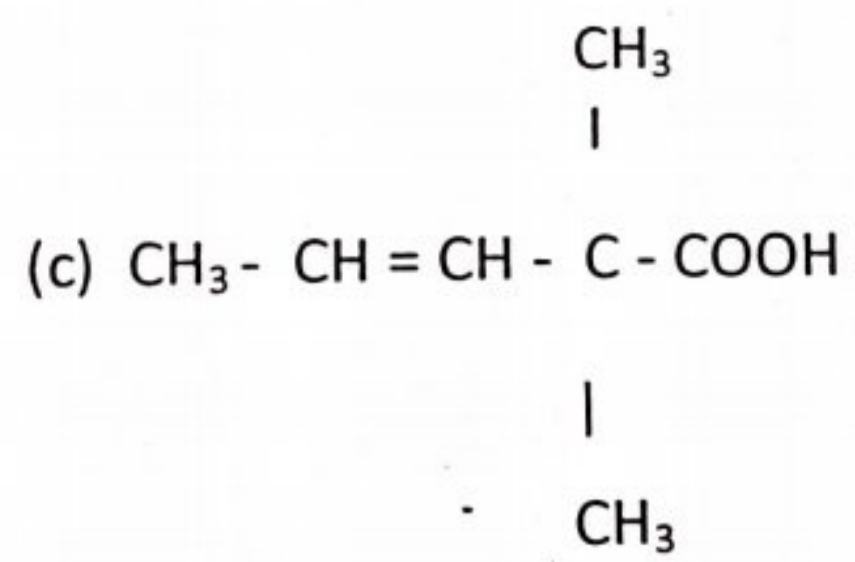
Or

Define Heat Capacity. Derive relation between Cp & Cv.

(iii) Explain Nucleophilic Substitution Reaction.

Or

Write the IUPAC names of the following organic compounds:

(a) $CH_3 - CH_2 - CH = CH - CHO$

(b) COOH
    |
    COOH

(c)
$$CH_3 - CH = CH - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - COOH$$

(d)
$$CH_3 - \overset{\overset{O}{||}}{C} - \overset{\overset{O}{||}}{C} - CH_3$$

(e)
$$CH_2 - OH$$
$$|$$
$$CH - OH$$
$$|$$
$$CH_2 - OH$$