Mast probably value of K.F.

Eigenvalues of operator à are ±1;

2.i) 
$$\psi = \exp(aiq)$$
  
Eigen value -> at

ii) 
$$\psi = \exp\left[\pm i(ax+by+cz)\right]$$
  
Eigen value =  $\pm (a^2+b^2+c^2)$ 

iii) 
$$\psi = a \cos \theta \quad [a \rightarrow constant]$$
  
Eigen value = (-2a)

- 3. i)  $Y = x \sin x \rightarrow Not$  an acceptable wavefunction
  - $Y = \frac{1}{x} \sin x \rightarrow Acceptable wavefunction$ ii)
  - -> Acceptable wavefunction iii)
    - $y = 1 e^{-x}$   $\rightarrow$  Not an acceptable wavefunction
- A linear combination of two or more wavefunctions will also be an eigenfunction of a quantum mechanical operator à under the condition -> when all the eigenvalues 4. ore equal.
- 5. (a)  $\psi(x)$  is not normalized.
  - Possible values of kinetic energy: E1, 3E1 and 7E1; (b)

(C) i)  $\langle K.E \rangle = \frac{45}{7} E_1$ 

ii) Most probable value of K.E = 7E1;

Probability of occurring = 44/49;

T = exp(aig.)

an entrat Value

(32+10+x0); 3 gx = #

Eigen selve = 1 (d'+b+ 1)

[Inderes - a] gesself sty

Eigen value in (- 30)

 $Y = X \leq m X \rightarrow Not con acceptable equefunction$ 

 $A = \frac{1}{x} \sin x \rightarrow A \operatorname{coepheble} \operatorname{isomefunction}$ 

4 - e - x - Acceptable was efunction

4 - e - x - y Not an acceptable wave function.

A vincent combination of two or more manefunctions as vincent also be an elgenfunction of a quantum medianical will also be an elgenfunction of what is under the elgenvalues.

percent.

tern is not normalized.

Possible values of kindic energy : E1, 3E1 and Pf1 ;