Answer1) The four approaches of AI are :-

(i) Systems acting humanly (The turing test approach)

(ii) Systems thinking humanly (The cognitive modelling approach)

(iii) Systems thinking rationally (The "laws of thought" approach)

(iv) Systems acting rationally (The rational agent approach)

The turning test is a deceptively simple method of determining whether a machine can demonstrate human intelligence: If a machine can engage in a conversation with a human without being detected as a machine, it has demonstrated human intelligence. Other name of turning test approach is system acting humanly approach.

Six capabilities a computer system should have toqualify for this test are :-

(i) 'Natural language processing' to enable it to communicate successfully in english

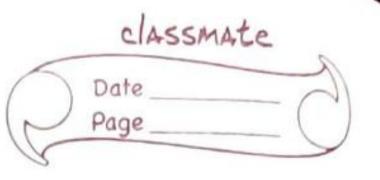(ii) 'Knowledge representation' to store what it know or hears.

(iii) 'Automated reasoning' to use the stored

information to answer questions and to draw new conclusions

(iv) 'Machine learning' to adapt to new circumstances and to detect and extrapolate patterns

(v) 'Computer vision' to perceive objects

(vi) 'Robotics' to main manipulat objects and more about:

* Task environment are problems to which rational agents are the solutions. The task environ- -ment is specified by PEAS PEAS stands for :- Performance. measure, Environment , Actuators, Sensors.
PEAS specifies the settings for an intelligent agent design.

Agent Type	Performance measure	Environ- ment	Actuators	Sensors
Satellite image analysis System	Correct image Categorization	Images from orbiting satellite	Display categori- -zation of a Scene	Color pixel arrays
Refinery Controller	Maximize Purity, yield, Safety	Refinery operators	Valves, pumps, heaters display	Temp, pressure, Chemical
Soccer player agent	goals, speed defending	football, goal, ground, other players	feet joints, motor	Camera proximity Senior
High jump performance agent	height, langing	Wall, Sponge, pole	Spring jumping machine	Camera, height Sensor

* The five components of problem solving agents are:-
  1. initial State
  2. actions
  3. transition model
  4. goal test
  5. path Cost

(i) for 8-queen problem
  1. initial State - no queen on board
  2. actions - add a queen to any empty tile
  3. transition model - move queen in column.

④ goal test — number of attack
⑤ path cost — cost to move

(ii) for Airline travel problem :—
① ^{s} initial state — The is speified by the
                    user's query
② actions — Take any flight from the
      current location, in any seat
      class, leaving after the
      current time.
③ Transition model — The state resulting
      from taking a flight will have
      the flight's destination as the
      current location and flight's
      arrival time as the current
      time.
④ Goal test :— Are we at the final
      destination specified by the
      user?

⑤ path cost :— This depends on
      monetary cost, waiting time,
      flight time, etc. —