Q1:

1. Intelligence: Ability to perceiving , understanding , predicting and manipulating surrounding world.
2. Artificial Intelligence: Artificial Intelligence is a branch of science which tries not only to reproduce the performance of intelligence task but also tries to build entities which can do such things.
3. Agent: Agent is something that performs an action.
4. Rationality: It is state of system, where system always performs an action which according to it is right .
5. Logical Reasoning: Logical Reasoning provides how facts and scientific truths leads to an action.

Q2:

Turing test contributes to challenge that machine can fool an interrogator to consider it as human. Through many competitions, there are number of chatbots which were able to fool some interrogators, but it is also because of the fact about how unskilled an interrogator .Thus at current state, chance of any chatbots passing a Turing test is about 10-20%. But current trends and investment in AI, especially for Games and Movies (Entertainment field), may make sure that AI could pass Turing test in next 50 years.

Q3:

Reflex actions can be considered rational since, in reflex action, person does what is right thing to do. But they cannot be considered as intelligent because there is only perceiving of surrounding but not manipulation of surrounding world.

Q4:

You cannot consider passing an IQ test with score of 200 as test of intelligence. Even though IQ test correlates with different fields of intelligence such as visual and perception, it doesn’t measure everything. Also IQ tests are not generalizable for their results and pre supposed about innate ability which makes them controversial.

Q5:

In Aplysia,

Number of Neurons = 2 \* 105

Cycle Time = 10-3 sec

Memory Updates/ sec = Number of neurons / Cycle Time

= 2 \* 105/10-3 = 2 \* 108

Memory Updates/ sec for Personal Computer = 1010

Hence personal computer is 100 times faster than Aplysia .

Q6:

Introspection of thoughts i.e. reporting on one’s inner thoughts can be considered as inaccurate. Introspection of thoughts requires reporting of what currently one is thinking and how he/she came to that thought. But when someone is reporting on thought, the person is actually thinking about report and not about thought. So whenever the person will be reporting, one would be reporting what one was thinking and not what one is thinking. This thinking pattern makes it difficult to report exact current thoughts. The other problem is how one reached to that thought. But humans are so unaware of their own minds that it’s almost impossible for anyone to let others know, how one may reached that thought,

Also as many philosophers have quoted, imagination power of brain is so incredible that it’s almost impossible just to keep track of all possible thoughts coming into the mind, less possible to report them all.

Q7:

1. Supermarket barcode Scanner: Bar code scanners have predefined sets of inventory numbers which they try to match with current product. Since for every new product, it is necessary to add data information into inventory for fetching it through barcode scanner, system simply becomes rule based pattern matching system or if else based system removing its possibility of artificially intelligent agent.
2. Web search Engines: Web search engines crawl through all webpages of internet in search of requested string and return contextual data. For this task they needed to search not only for matching strings, but also the context correlation between words in strings. Even though previous search engines were not capable of performing such things, today’s search engines have capabilities to perform such task intelligently.
3. Voice operated telephone Menu: It is common example of voice user interface (VUI) where machine waits for particular word (keyword) to be spoken and performs action accordingly. May be one can add Natural Language Processing to it, but unless that happens, its simple VUI receiving keywords and performing action over it. Thus not making itself an Artificial Intelligent Agent.
4. Internet routing algorithm that respond dynamically to the state of network: It can be considered as somewhat intelligent since dynamicity of algorithm makes it heuristic (might be optimal might be not) . Also information available is partial thus no simple algorithm could work its way out. But it still cannot be considered as fully intelligent

Q8:

The performing of complex mathematical operations, such as convolving an image with Gaussian model, is part of action getting performed by user/actual person. Now living bodies sensor systems are results of thousands of years of evolution process. Thus such complex mathematical operation performance was developed as the need required. Learning these operations helps one to apply advantages of them to somewhere else rather than over its own sensory system, since our brain has been evolved in the manner where it can perform it as per of bigger procedure.

Q9:

Evolution of living beings motivates systems to be rational .Now, for any living system , right thing to do is to survive and to reproduce .Now , adaptation of living beings to their surrounding is the result of their survival instinct, thus making them rational.

Q10:

A science is field of study that leads to gaining knowledge with fallible theory while engineering is the field of applying gained knowledge/science to real world problem. Thus AI seems to be both.

Q11:

Surely the second statement is true. Computers can do only what their programmers tell them, but that cannot imply the former statement. For intelligence, computers should be able to perform manipulation of surrounding on the basis of perceived data that which they can do like Embedded System. Even though systems currently designed are specific to particular scenario, soon systems are able to apply their factorial knowledge to gain manipulation of surrounding environment, thus gaining intelligence.

Q12:

Even though animals do what their genes told them to do, genes have been adapted by applying constant intelligence by animals to their surrounding environment. Thus genes are actually developed due to animal’s intelligence.

Q13:

By this logic, diamond and humans should be considered as equal since both of them are made of Carbon. But still humans are considered intelligent, so do animals and hence computers as well.

Q14:

a. (Ping-Pong) A reasonable level of proficiency was achieved by Anderson’s robot (Anderson,1988).

b. (driving in Cairo) No. Although there has been a lot of progress in automated driving,All such systems currently rely on certain relatively constant clues: that the road has shoulders and a center line, that the car ahead will travel a predictable course, that cars will keep to their side of the road, and so on. Some lane changes and turns can be made on clearly marked roads in light to moderate traffic. Driving in downtown Cairo is too unpredictable for any of these to work.

c. (driving in Victorville, California) Yes, to some extent, as demonstrated in DARPA’s Urban Challenge. Some of the vehicles managed to negotiate streets, intersections, well-behaved traffic, and well-behaved pedestrians in good visual conditions.

d. (shopping at the market) No. No robot can currently put together the tasks of moving in a crowded environment, using vision to identify a wide variety of objects, and grasping the objects (including squishable vegetables) without damaging them. The component pieces are nearly able to handle the individual tasks, but it would take a major integration effort to put it all together.

e. (shopping on the web) Yes. Software robots are capable of handling such tasks, particularly if the design of the web grocery shopping site does not change radically over time.

f. (bridge) Yes. Programs such as GIB now play at a solid level.

g. (theorem proving) Yes. For example, the proof of Robbins algebra described on page

360.

h. (funny story) No. While some computer-generated prose and poetry is hysterically funny, this is invariably unintentional, except in the case of programs that echo back prose that they have memorized.

i. (legal advice) Yes, in some cases. AI has a long history of research into applications of automated legal reasoning. Two outstanding examples are the Prolog-based expert systems used in the UK to guide members of the public in dealing with the intricacies of the social security and nationality laws. The social security system is said to have saved the UK government approximately $150 million in its first year of operation. However, extension into more complex areas such as contract law awaits a satisfactory encoding of the vast web of common-sense knowledge pertaining to commercial transactions and agreement and business practices.

j. (translation) Yes. In a limited way, this is already being done. See Kay, Gawron and Norvig (1994) and Wahlster (2000) for an overview of the field of speech translation, and some limitations on the current state of the art.

k. (surgery) Yes. Robots are increasingly being used for surgery, although always under the command of a doctor. Robotic skills demonstrated at superhuman levels include drilling holes in bone to insert artificial joints, suturing, and knot-tying. They are not yet capable of planning and carrying out a complex operation autonomously from start to finish.

Q15:

The progress made in this contests is a matter of fact, but the impact of that progress is

a matter of opinion.

• DARPA Grand Challenge for Robotic Cars In 2004 the Grand Challenge was a 240 km race through the Mojave Desert. It clearly stressed the state of the art of autonomous driving, and in fact no competitor finished the race. The best team, CMU, completed only 12 of the 240 km. In 2005 the race featured a 212km course with fewer curves and wider roads than the 2004 race. Five teams finished, with Stanford finishing first, edging out two CMU entries. This was hailed as a great achievement for robotics and

for the Challenge format. In 2007 the Urban Challenge put cars in a city setting, where they had to obey traffic laws and avoid other cars. This time CMU edged out Stanford. The competition appears to have been a good testing ground to put theory into practice, something that the failures of 2004 showed was needed. But it is important that the competition was done at just the right time, when there was theoretical work to consolidate, as demonstrated by the earlier work by Dickmanns (whose VaMP car drove autonomously for 158km in 1995) and by Pomerleau (whose Navlab car drove 5000km across the USA, also in 1995, with the steering controlled autonomously for 98% of the trip, although the brakes and accelerator were controlled by a human driver).

• International Planning Competition In 1998, five planners competed: Blackbox, HSP, IPP, SGP, and STAN. The result page (ftp://ftp.cs.yale.edu/pub/mcdermott/aipscomp-results.html) stated “all of these planners performed very well, compared to the state of the art a few years ago.” Most plans found were 30 or 40 steps, with some over 100 steps. In 2008, the competition had expanded quite a bit: there were more tracks (satisficing vs. optimizing; sequential vs. temporal; static vs.learning). There were about 25 planners, including submissions from the 1998 groups(or their descendants) and new groups. Solutions found were much longer than in 1998. In sum, the field has progressed quite a bit in participation, in breadth, and in power of the planners. In the 1990s it was possible to publish a Planning paper that discussed only a theoretical approach; now it is necessary to show quantitative evidence of the efficacy of an approach. The field is stronger and more mature now, and it seems that the planning competition deserves some of the credit. However, some researchers feel that too much emphasis is placed on the particular classes of problems that appear in the competitions, and not enough on real-world applications.

• Robocup Robotics Soccer This competition has proved extremely popular, attracting 407 teams from 43 countries in 2009 (up from 38 teams from 11 countries in 1997). The robotic platform has advanced to a more capable humanoid form, and the strategy and tactics have advanced as well. Although the competition has spurred innovations in distributed control, the winning teams in recent years have relied more on individual ball-handling skills than on advanced teamwork. The competition has served to increase interest and participation in robotics, although it is not clear how well they are advancing

towards the goal of defeating a human team by 2050.

• TREC Information Retrieval Conference This is one of the oldest competitions, started in 1992. The competitions have served to bring together a community of researchers, have led to a large literature of publications, and have seen progress in participation and in quality of results over the years. In the early years, TREC served its purpose as a place to do evaluations of retrieval algorithms on text collections that were large for the time. However, starting around 2000 TREC became less relevant as the advent of the World Wide Web created a corpus that was available to anyone and was much larger than anything TREC had created, and the development of commercial search engines surpassed academic research.

• NIST Open Machine Translation Evaluation This series of evaluations (explicitly not labeled a “competition”) has existed since 2001. Since then we have seen great advances in Machine Translation quality as well as in the number of languages covered.

Q16:

I will cover this question later

Q17:

Fill up 5 liter jug full and empty it in 3 liter jug .The remaining water will be 2 liter in 5 liter jug.

Q18:

a. Water Jug Problem: Recoverable

b. 8Puzzle: Recoverable

c. Chess: Irrecoverable

d. Theorem Proving: Ignorable