Question: 1. Explain working of Electronic Jacquard and make a comparison with Mechanical Jacquards.

In these machines the traditional hooks have been replaced by electro-mechanically operated modules which are driven and controlled by an electronic program. The Jacquard machines available on the market are double lift machines and have in respect to mechanical Jacquard machines following advantages:

- **Easy maintenance** owing to following reasons: no point needing lubrication, few moving parts, modular construction and thus easy access;
- **Low vibration even at high speed;**
- **Reduced setting time**, as the machine is electronically controlled and therefore no paper is needed.

Figure show the two most widely used models of electronic Jacquard machines.

In Figure 1 each module is composed of 48 hooks; by combining together several modules, it is possible to attain the various capacity loads. The hook is flexible and has windows to allow its hooking-up to the magnet. The machine operates as follows: in the first two sequences of Figure 1, the magnet (controlled by the program) does not receive any impulse and the double pulley maintains the warp thread in bottom position, although the hooks move upwards and downwards together with the griffe knives (the rotation of the upper pulley compensates the movement of the hooks).

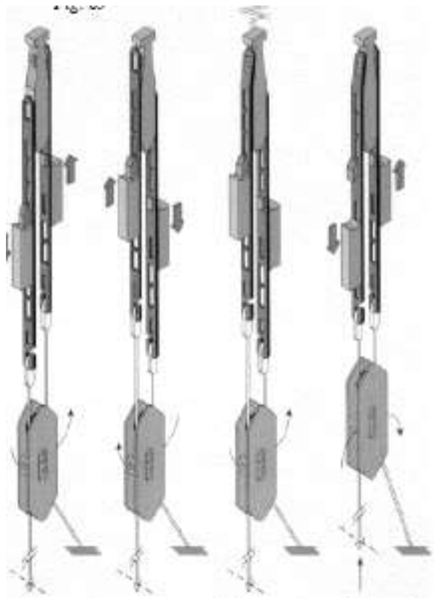

Figure:1

The last two sequences of Figure 1 show that, when a thread needs to be raised, the magnet receives the impulse and the flexible hook hooks-up to the magnet. This causes the lifting of the double pulley, as in this case it is not possible to make any compensation. In the model shown in Figure 2, the elements raising the heald frames 18 and 19 operate in opposition one another. In figure A the knife 18 is positioned at the upper dead center, whereas the knife 19 is at the bottom dead center. At the end of the stroke, the movable hooks 6 connected with the suspension cable 9 lean alternatively the upper end of the check hooks 4 on the electromagnet 5.

Thre are two cases:

1) The electromagnet 5 is powered (case A):

- The check hook 4 remains ″stuck″ to electromagnet 5.
- The movable upper hook 6 goes down together with knife 18.
- The lifting cord 10 goes up or remains in bottom position.

2) The electromagnet 5 is not powered (case C):

- Owing to spring 3, the check hook 4 hooks up the movable upper hook 6, which therefore remains in upper position.
- The lifting cord 10 goes up or remains in upper position.
- The body of the rocker arm 7 linked to the fixed point 11 reinstates a shifting of the lifting cord 10 equal to that of knife blades 18 and 19.

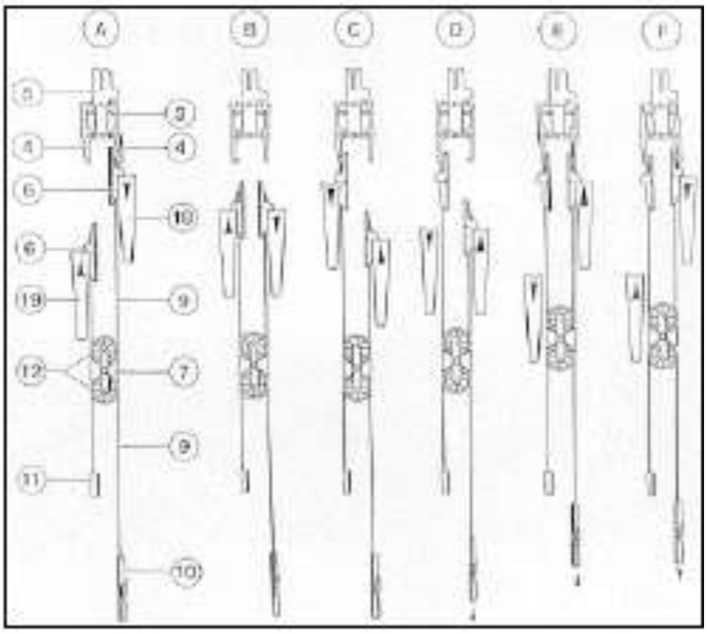

Figure:2

Question: 2 Write various modern developments in terry weaving.

Answer: There are two warp systems including ground warp and pile warp, and thus two warp beams are let off simultaneously in a terry weaving machine. The ground warp ends move forward slowly and under high tension as the ground warp beam turns slowly. At the same time, the pile warp ends move forward quickly and loosely as the pile warp beam turns faster than the ground warp beam. Ground and pile warp beams are propelled by two different independent motors. Rpm's (revolution per minute) of the pile warp beams is proportional to the required pile height. The higher speed delivers more yarn to increase the pile height. During let- off, pile tension is controlled continuously. This decreases yarn breakages, and avoids out-of tolerance loop heights. In Figure the Terry Motion Control System of Tsudakoma is shown.

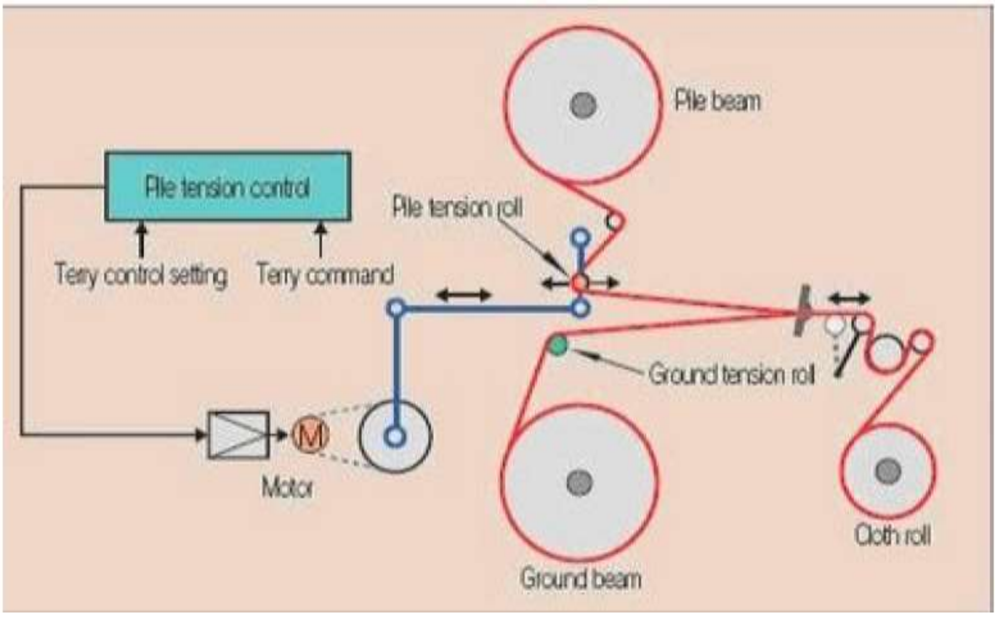

Figure: Pile tension control device

Here, pile tension is determined by pile tension roll which is propelled by a motor guided by electronic pile tension control system allows, so that it can hold the maximum length of pile warp. Keeping the pile beam's diameter large avoids changing the beam frequently Pile Tension Control System Diagram of Pile Warp Tension during weaving pile, plain and border parts The width of the pile beam is between 76 – 144 inches (190 - 360 cm) and the diameter of its flange can be up to 50 inches (125 cm), while the flange diameter of the ground beam is up to 40 inches (100 cm).

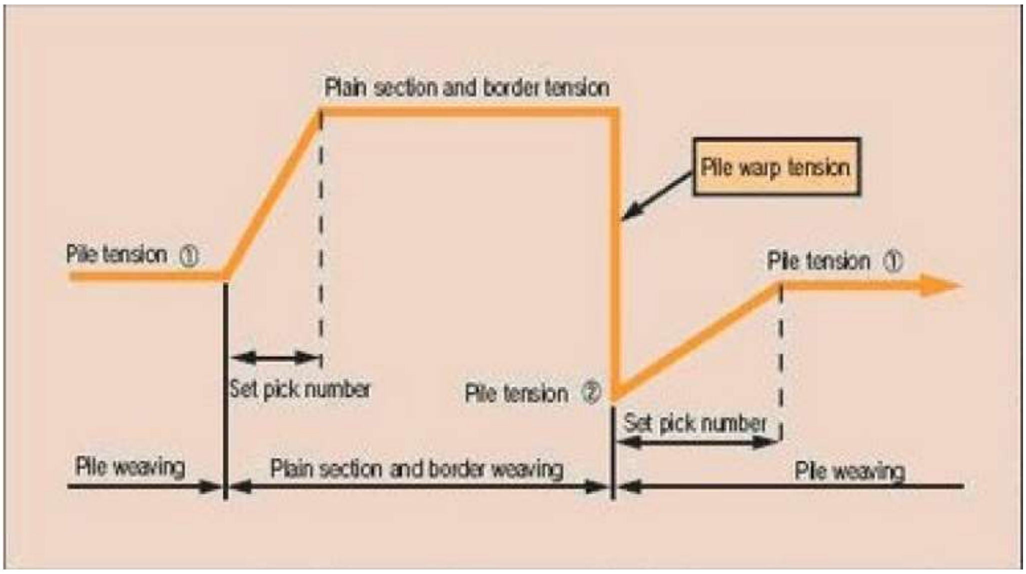

Figure: Pile Warp Tension during weaving pile, plain and border parts

The two warp systems are evenly let- off by a system of constant tension control from full to empty beam. This is controlled by a highly sensitive electronic device. The tensions of the pile and ground warps are detected by force sensors and electronically regulated Elimination of unwanted increase of tension of warp tension during weaving high density border and/or plain section is achieved by reducing let-off speed the diagram of pile warp tension in modern Terry looms during weaving of pile, plain and border areas is shown. In Figure the diagram of loom rpm's in modern Terry looms during pile weaving and border weaving is shown

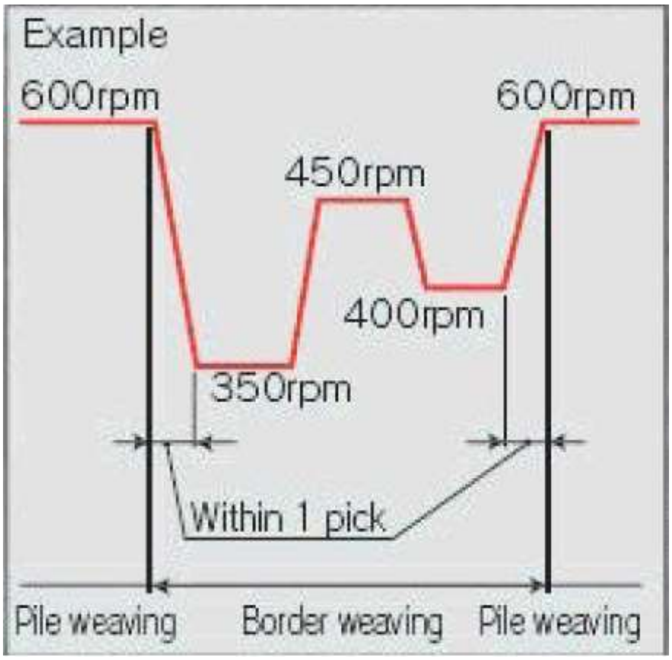

Figure: Loom Rpm's during weaving pile and border areas

To prevent starting marks or pulling back of the pile loops, the pile warp tension can be reduced during machine standstill. An automatic increase in tension can be programmed for weaving borders to achieve more compact weave construction in order to ensure a rigid border and/or to achieve nice visual effects via jacquard or dobby designs on the border. The way the back rest roller system is controlled depends on the weave. During insertion of the loose picks and during border or plain weaving the warp tension between the open and closed shed is compensated for by negative control. A warp tensioner with torsion bar is used for the ground warp, and a special tension compensating roll is used for the pile warp