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Subject — Power Electronic

Date — 23-6-2020

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Question No 01

Ans 01:

Solar thermal and hybrid just seem to have an increasingly tough time hitting their paybacks for large installations. not because either of these are deficient. but because the juggernaut of PV has rolled so strong and so hard through the building technologies sector. PV keeps making it harder for everything else to complete.

My approach on this is to assume that the human cost is inevitably the expensive one mistake cost more than high technology. training expensive. People properly relate through

jobs. They call in sick, they vary the way they interact with System.

PV seems to be best positioned to minimize the human cost of power. once installed the maintenance is minimal, there are few integration problem of weather dealing with hybrid system, not having to maintain and replace things like pump and compressors is helpful. I've seen some wonderful hybrid technologies. but they are inevitably custom made and just can't compete on power with PV which is rolled off of assembly lines like taffy. PV was just the lucky one to benefit from scale integration. partly as a byproduct of the semiconductor industry. the regulation, building codes and

Processes are being optimized for PV in ways that they just can't standardize for less-popular system.

The problem you mention about integration with PV are with us for solar thermal and hybrid as well. They all need variation in code and training.

But with PV, the whole industry is working to the resolution of the integration issues.

Question No 2

Ans:-2

The main difference between grid forming and grid supporting as

" A grid forming control is used for a single inverter to set the voltage amplitude and frequency in an islanded microgrid. That it does not operate in Parallel with any inverter and doesn't share the voltage and frequency regulation responsibility with any inverter"

" A grid supporting operating as a current source (grid supporting - grid feeding) has the main objective of delivering Power

(active and reactive). This is technically an improved grid feeding control that uses the droop control to contribute to the main frequency and voltage regulation and may operate in parallel with other like minded inverters.

(2) "Grid forming" Inverter is a power conversion System for energy Storage applications. The inverter allows for control of both real and reactive power.

(3) A grid Supporting operating as a voltage Source (grid Supporting - grid forming) does not operate Synchronously with a traditional grid System. It operates within a Large autonomous microgrid just as a grid forming System. It operates with in a

large autonomous just as a grid forming controlled inverter. In this case, it is called grid Supporting. not because it is connected to a traditional main grid. it is called grid Supporting Control Strategy. with the help of droop these inverters are able to collectively regulate the frequency and voltage amplitude of the autonomous microgrid where they operate. In fact I am Currently working on an autonomous inverter-based microgrid and I applied grid Supporting Controls for all the Constituent inveters. this is the reason of Constributed inveters.

Question No 3

Ans:3

Electric cars and hydrogen cars are both run on apparently clean fuels.

Hydrogen fuel cell vehicles tend to be more frugal their battery electric counterparts. According to autocar. the Hyundai NEXO comes with a real-world range of '414' miles and filling up takes just five minutes. whereas electric charging can be an hour-long affair at the best of times.

will the technologies of electric motors and the new generation of batteries

Installed in Car and other motor vehicles motor be developed in the scope of the main direction of development of electromobility of the automotive industry. will the technology of hydrogen engines or other types of engines be developed as part of the development of eco-motorisation. At Present in the majority of Countries, there is no financial resources for financing high budget from Public finance funds. New technologies Solution in the field of renewable energy Sources. New electrodes producing electricity for the needs of electromobility in the automotive industry. New generation of battery Photovaltaic panels. energy Storage and Transmition Station hydrogen and other engines. There may be not enough time to carry out the necessary reforms to reduce green house gas emissions

Both technologies should be developed as quickly as possible so that cars based on electromobility and other ecological energy souce become widely available. The Intrastructure of the better charging stedion and hydrogen-oxygen fuel should be also built.

Which technology will develop to a greater extend will be determined by the time and cost of charging of fuel.

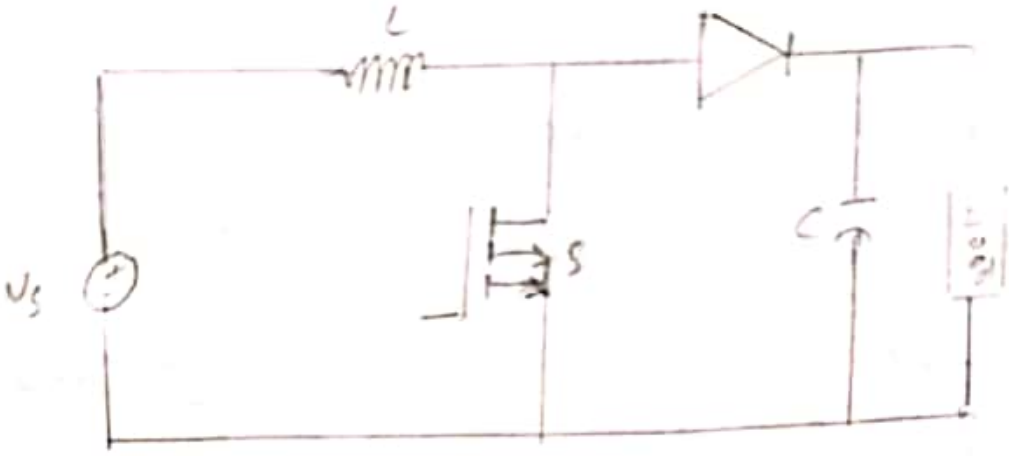
Question No 4

Ans.; 4

A boost Converter is a DC-to-DC Power Conveter that Step up voltage from its input. it is a class of Switched mode power Supply Containing at least two Semiconductor and at least one Energy Storage element: a Capacitor, inductor, or the two in Combination.

=> It is used for Step-up an input voltage to Some higher level. required by a load. This unique Capability is achieved by Storing Energy in an Inductor and releasing it to the load at a higher voltage. This brief note highlights Some of the more Comm pitfalls when

Using boost regulators.



Boost Converter Stepup

For example:

The motor used in driving electric automobiles require much higher voltages, in the region of 500V, than could be Supplied by a battery alone. The boost Converter different to the Buck Converter in that it's output voltage is equal to, or greater than its input voltage.

Question No (5)

Ans:,

A Cycloconverter is a device that converts AC, power at one frequency into AC power of an adjustable but lower frequency without any direct current.

Type of Cycloconveter:,

(i) Step up Cycloconverter.

(2) Step down Cycloconverter.

According to output voltage.

(1) Single Phase to Single Phase

(ii) Single Phase to three Phase

(iii) Three Phase to three Phase

(iv) centretaped Cycloconveter

(v) Bridge Configuration Cycloconverter.

Principle of Cycloconverter:

The cycloconverter consists of dual converter in which one converter works as positive converter whereas the other as the negative converter.

Advantages:

(i) Higher efficiency due to single stage conversion.

(ii) All the cycloconverter works on line commutation except step up cycloconverter therefore it is not necessary for extra commutating components.

(iii) The power transfer from supply to load and vice versa at any power factor.

(iv) It can operate at distorted output waveform in the case of one SCR get dameged.

(5) It can generate high quality sinusoidal waveform particular at Low frequency whereas the static generate step wave voltage waveform at Low frequency (< 10 Hz)

Disadvantages:

(i) Low Power factor for Low output voltage

(ii) Control circuit becomes complex due to higher number of SCRs.

(iii) The supply should be short circuited due to failure of commutation circuit.

The End