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JAMSHORO

**Department
of
Electrical
Engineering**

APPLIED PHYSICS (24BSAI)

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Capacitance measurement

- LCR meter is used to measure capacitance
- L =Inductance
- C =Capacitance
- R =Resistance





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Capacitor Applications

- Store electrical charge
 - ◆ Charged capacitor works as a temporary battery/temporary power source.

- ◆ Application 01
 - ◆ Used in computer memories to store 1 or 0 bit
 - E.g. 5V and 0V may represent bit 1 and 0 respectively



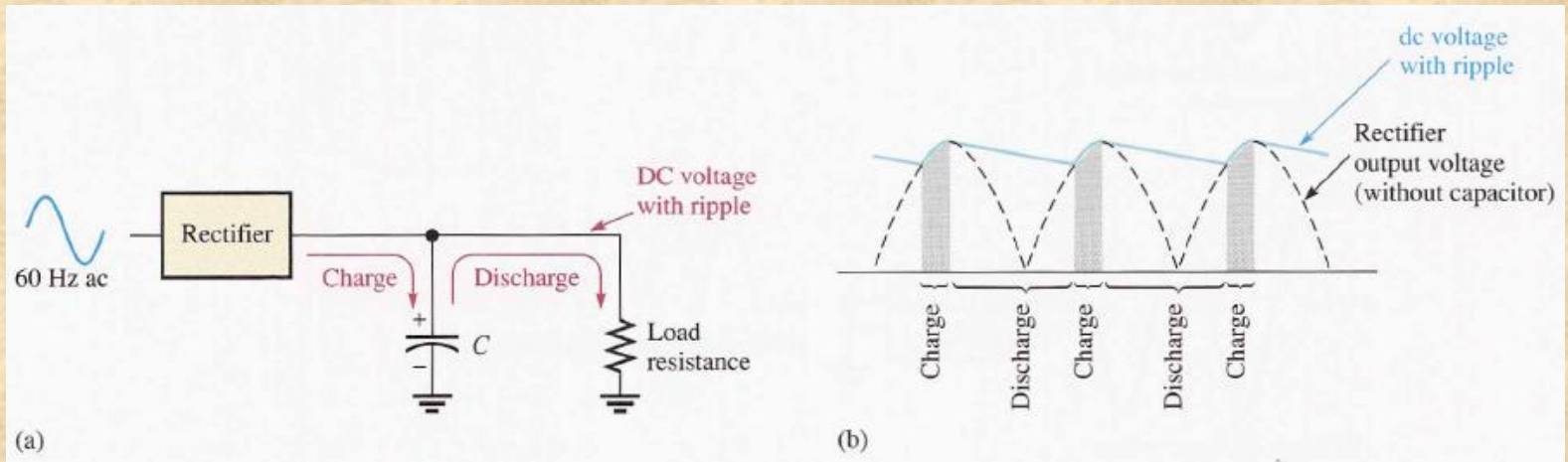
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◆ Application 02

- ◆ Used in DC power supply for signal filtering purpose





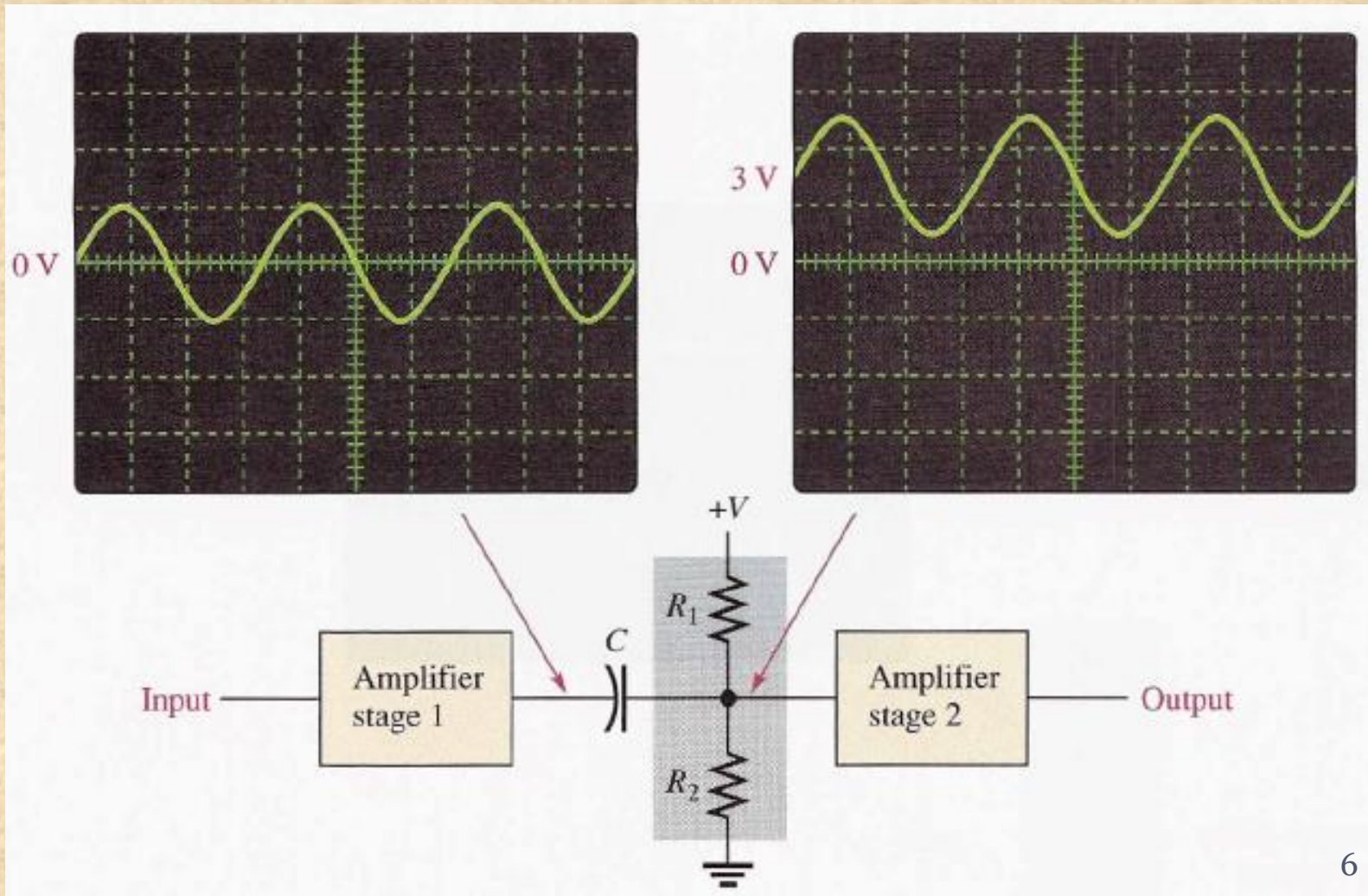
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◆ Application 03

◆ DC blocking and AC coupling in an amplifier





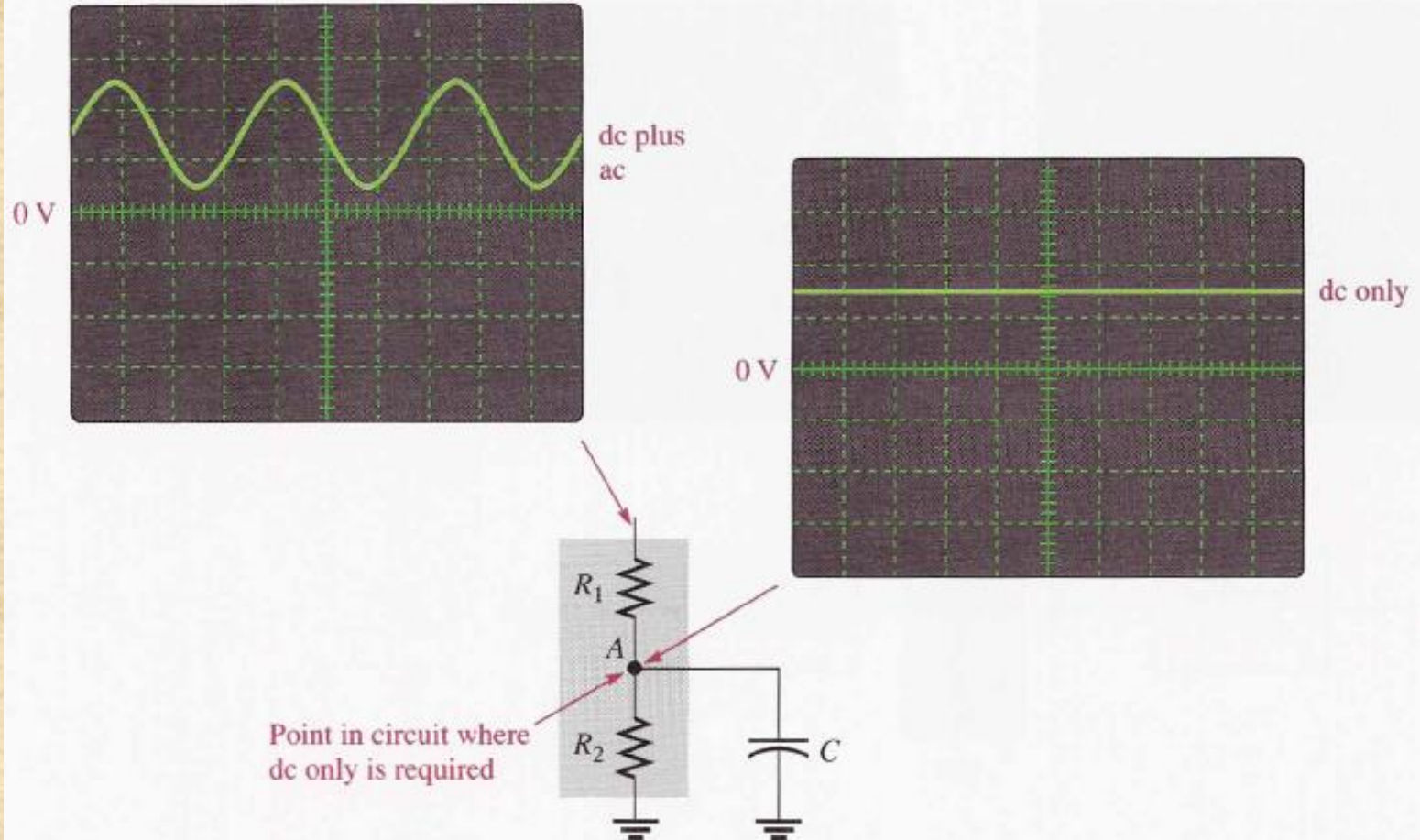
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◆ Application 04

- ◆ Bypassing AC signal (In biasing circuits constant DC is required)





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◆ Application 05

◆ Timing circuits (Introducing delay)

- Charging time of a capacitor can be used as delay for some circuits.
- Example: Car turn indicator flash light turns on and off at regular intervals



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◆ Application 06

◆ Power line decoupling

- Capacitors connected from DC power supply line to ground can decouple transients/spikes in DC signal.
- Transients in DC signal have frequency components, and capacitor provides less reactance path to transients towards ground.



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◆ Application 07

◆ Signal filtering

◆ Used to select particular frequency AC signals from many signals.

◆ Variable capacitor is used in Radio/TV to tune particular frequency.

◆ $X_c = 1/2 * \pi * f * c$



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- ◆ Application 08
- ◆ To start AC Motor
 - ◆ Used to start single phase AC induction motor like fan or donkey pump motor etc



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Capacitor in A.C circuits

- Non-Polar capacitor should be used in A.C circuits.
- As A.C signal is varying quantity, so to understand capacitor work in A.C circuits, concept of derivative must be introduced



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Capacitive reactance X_C

- Opposition to sinusoidal current
- Expressed in Ohms
- Symbol is X_C

$$X_C = \frac{1}{2\pi fC}$$



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*Thank
you*

