KUMARAGURU
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B.E. DEGREE EXAMINATIONS: NOV/DEC 2022

(Regulation 2018)

Third Semester

AERONAUTICAL ENGINEERING

**U18EEI3202: Aircraft Electrical and Electronics Systems**

COURSE OUTCOMES

CO1: Discuss the fundamentals of DC circuits and its applications in aircraft systems.

CO2: Explain the relationships among current, voltage and power in AC circuits and their role in aircraft systems.

CO3: Explain the construction, working principle of electrical machines and their applications in aircraft systems.

CO4: Explain the working of semiconductor devices and their role in aircraft systems.

CO5: Apply the fundamentals of digital electronics to digital circuits.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
**PART A (10 x 2 = 20 Marks)**
(Answer not more than 40 words)

1. Differentiate Linear elements and nonlinear elements.	CO1	[K_2]
2. What is the equivalent resistance between A and B?	CO1	[K_3]
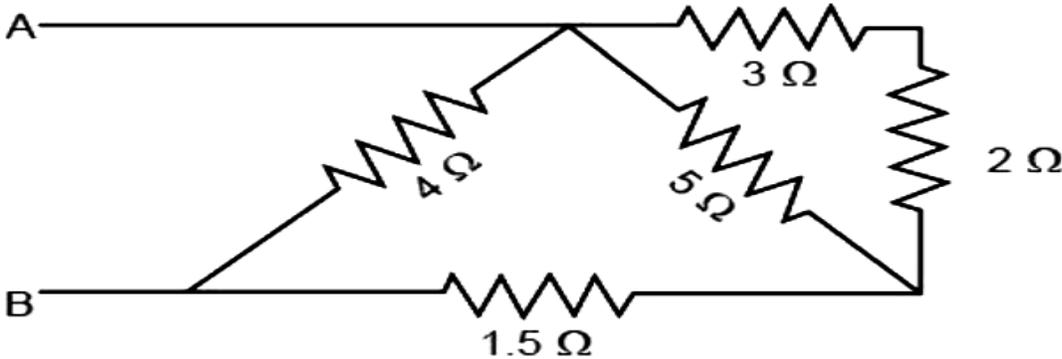
3. Define form factor in AC circuit and mention the value of form factor for sine wave.	CO2	[K_1]
4. Draw Power triangle of AC circuit?	CO2	[K_2]
5. Why is aircraft electrical system important?	CO3	[K_2]
6. How the generator control system works on aircraft electrical systems?	CO3	[K_2]
7. Mention the application of BJT in aircraft system.	CO4	[K_3]
8. State the disadvantages of Half wave rectifiers.	CO4	[K_2]

9. Write the logical expression for the given circuit shown in fiqure.1   CO5 [K$_2$]
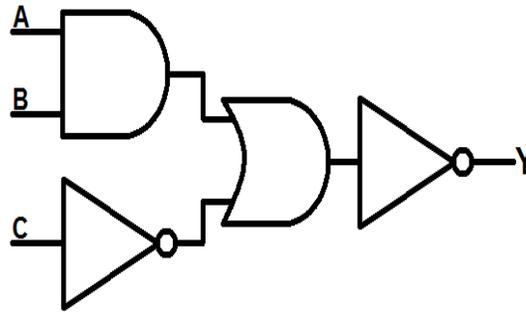
10. Mention the function of multiplexer?   CO5 [K$_2$]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11. a)   (i) Explain the Kirchhoff's laws with example.   6   CO1 [K$_2$]

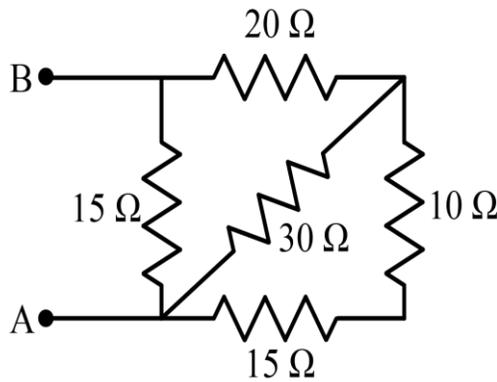   (ii). Determine the equivalent resistance between points A and B.   4

Figure 2

   b)   **Using Kirchhoff's laws of current and voltage, find the current in 2 Ω resistor**   6   CO1 [K$_2$]
   in the given circuit.

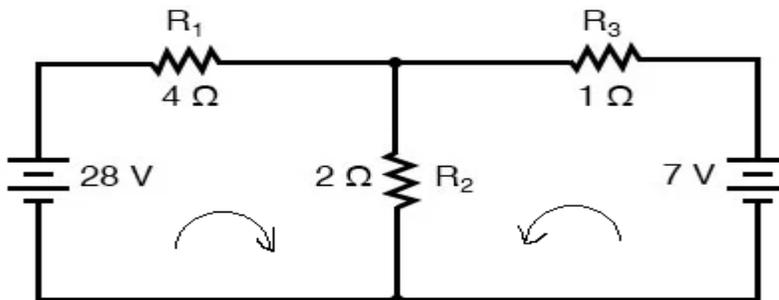Figure 3

12. a)   Find the average value, rms value and formfactor of the given figure.   10   CO2   [K₃]

From figure:

$$V(t) = 4 * t \qquad 0 \le t \le 1$$
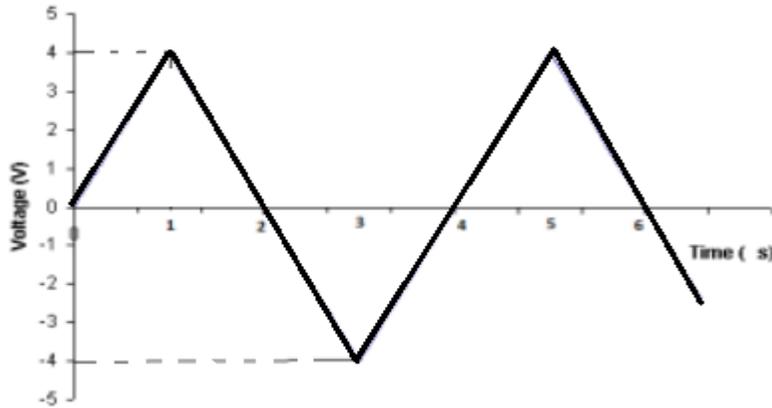$$= 4 - 4(t - 1) \quad 1 \le t \le 2$$

Figure 4

   b)   Explain about the alternating current through the pure capacitor circuit and draw   6   CO2   [K₃]
its waveforms and vector diagram.

13. a)   Describe the construction of DC machine with neat diagram.   10   CO3   [K₂]

   b)   Explain the construction and principle of operation of single-phase transformer.   6   CO3   [K₂]

14. a)   Explain the working of PN junction diode and draw its V-I characteristics.   8   CO4   [K₂]

   b)   Discuss about the operation of Full wave rectifier with waveforms.   8   CO4   [K₂]

15. a)   Explain the full adder circuits with truth table and logic diagram.   8   CO5   [K₂]

   b)   Describe about working of 1 to 4 multiplexer with block diagram and truth table. 8   CO5   [K₂]

16. a)   Explain the Construction of an alternator with neat diagram.   8   CO3   [K₂]

   b)   Derive an expression for average and RMS value of sine wave voltage.   8   CO4   [K₂]

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