

4046**BOARD DIPLOMA EXAMINATION, (C-14)****JUNE-2019****DEEE - FIRST YEAR EXAMINATION****BASIC ELECTRICAL ENGINEERING**

Time: 3 Hours

Max.Marks : 80

PART-A**10x3=30M**

Instructions: 1) Answer **all** questions. Each question carries **three** marks.
2) Answers should be brief and straight to the point and shall not exceed five simple sentences.

- 1) Distinguish between conductor, insulator and semi-conductor with respect to Valance Electrons.
- 2) Explain the effects of temperature on Resistance.
- 3) Define Work, Power and Energy
- 4) Define Thermal efficiency.
- 5) List the properties of magnetic lines of force.
- 6) State Biot-savart's law.
- 7) State Faraday's Laws of Electromagnetic induction.
- 8) State Fleming's Right hand rule.
- 9) Define Potential difference.
- 10) Explain on what factors does the capacitance of parallel plate capacitor depend.

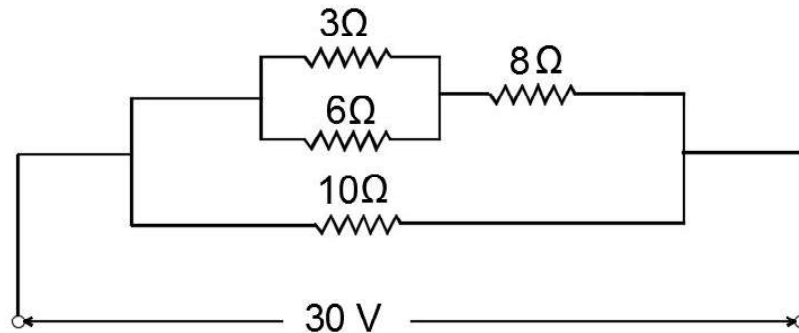
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PART-B

5x10=50M

- Instructions:** 1) Answer any **five** questions. Each question carries **ten** marks.
2) Answers should be comprehensive and the criteria for valuation is the content but not the length of answer.

- 11) (a) State the factors upon which the resistance of the conductor depends. 4M
(b) Calculate the increase in resistance of a coil when its temperature increases from 20°C to 80°C. Take resistance at 20°C as 50Ω and $\alpha_0 = 0.004/^\circ\text{C}$. 4+6M
- 12) Calculate the current in each resistor and voltage across each resistor.



- 13) A 440 V motor is used to drive an irrigation pump. The efficiency of the motor is 85% and the efficiency of the pump is 66%. The pump is required to lift 24×10^4 kG of water per hour to a height of 30m. Calculate the current taken by the motor.

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- 14) (a) State Joule's Law of electric heating. 4M
(b) An electric heater is used to raise the temperature of one liter of water from 30°C to 80°C. If a 1kW element is used in the heater, determine the time required to heat the water. Assume the overall efficiency of heater is 90% and the mechanical equivalent of heat is 4.2 J/calories. 6M

- 15) (a) Derive an expression for force between two parallel current carrying conductors. 4M
(b) Explain about energy stored in magnetic field and derive the expression for energy stored per unit volume. 6M
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- 16) (a) Explain Dynamically induced Emf. 5M
(b) A certain coil is wound with 50 turns and a current of 8 A produces a flux of $200 \mu\text{wb}$. Calculate 5M
(i) Inductance of the coil
(ii) emf induced when the above current is reversed in 0.2sec.
- 17) (a) Obtain an expression for the total inductance when two coils are connected in series such that their flux are aiding. 5M
(b) Calculate the Energy stored in a magnetic field of an air cored solenoid 1 m long having a cross sectional area of 0.05 m^2 if it is carrying a current of 3A. The number of turns of solenoid coil are 850. 5M
- 18) (a) State and explain Coulomb's Laws of Electrostatics. 5M
(b) Derive an expression for energy stored in a capacitor. 5M

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