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Total Number of Pages : 03

B.Tech.
15BE2102

2nd Semester Back Examination 2017-18

BASIC ELECTRICAL ENGINEERING

BRANCH : AEIE, AERO, AUTO,

**BIOMED, BIOTECH, CHEM, CIVIL, CSE, ECE, EEE, EIE, ELECTRICAL, ENV, ETC,
FASHION, FAT, IEE, IT, ITE, MANUFAC, MANUTECH, MARINE, MECH, METTA,
METTAMIN, MINERAL, MINING, MME, PE, PLASTIC, TEXTILE**

Time : 3 Hours

Max Marks : 100

Q.CODE : C921

Answer Part-A which is compulsory and any four from Part-B.

The figures in the right hand margin indicate marks.

Answer all parts of a question at a place.

Part – A (Answer all the questions)

Q1: Answer the following questions: *multiple type or dash fill up type* (2 x 10)

- a) What is the relation between time period T and frequency?
i) $T = 1 / \text{frequency}$. ii) $T = 0.5 / \text{frequency}$.
iii) $T = 0.85 / \text{frequency}$. iv) $T = \text{frequency}$.
- b) Resistivity of a conductor depends on _____ and _____.
- c) An electrolytic capacitor can be used for
i) DC only. ii) AC only.
iii) both A and B. iv) none Of the above.
- d) While comparing magnetic field and electric circuits, the point of dissimilarity exists while considering
i) mmf and emf. ii) reluctance and resistance.
iii) flux and current flow. iv) permeance and conductance.
- e) A motor having a power factor of 0.8 absorbs in active power of 1200 W the reactive power drawn from the supply is _____ VA.
i) 130 ii) 900
iii) 250 iv) 400
- f) If field current is decreased in shunt dc motor, the speed of the motor
i) remains same. ii) increases.
iii) decreases. iv) none of the above.
- g) In DC generators brushes are used for
i) collecting of current without any sparkings
ii) collecting of voltage
iii) reduce eddy current loss
iv) convert ac armature current in to dc
- h) Transformer core is made with laminated steel sheets in order to
i) Increase eddy current loss ii) decrease hysteresis loss
iii) Decrease eddy current loss iv) decrease copper loss.
- i) Series generators are used in which of the following applications?
i) air crafts
ii) arc welding
iii) used as boosters in dc distribution or transmission
iv) all of the above
- j) How many coulombs of charge flow through a circuit carrying a current of 10 A in 1 minute?
i) 10 ii) 60
iii) 600 iv) 1200

Q2 Answer the following questions: Short answer type: (2 x 10)

- What are the fundamental difference between e.m.f and potential difference?
- What will be the problem, if a capacitor directly connected to DC source?
- Why does the kinetic energy of a charged particle moving in a magnetic field remain constant?
- In a series RLC circuit, is it possible to achieve series resonance without changing the supply frequency. Justify your answer.
- What do you mean by phase sequence? How can the phase sequence be reversed?
- Why should an ammeter have low resistance?
- Which DC motor have more field resistance and why?
- What is the objective of Thevenin's theorem? How thevenin's voltage is calculated.
- Why iron core transformers are not used for high frequency applications?
- What do you mean by A/D and signal conditioning?

Part – B (Answer any four questions)

Q3 a) A 20V battery with an internal resistance of 5Ω is connected to a resistor of x ohms. If an additional 6Ω resistor is connected across the battery, find the value of x so that the external power supplied by the battery remains the same. **(10)**

b) Explain the principle of operation of dc motor. **(5)**

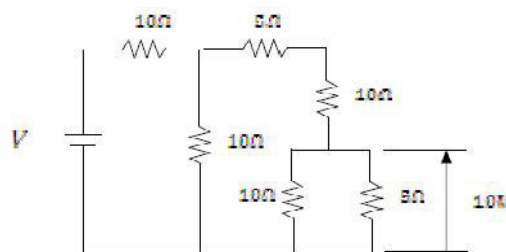
Q4 a) A coil of resistance 10Ω and inductance 0.1 H is connected in series with a $150 \mu\text{F}$ capacitor across a 200 V, 50 Hz supply. Calculate the voltage across the coil and the capacitor respectively. **(10)**

b) State and explain Kirchoff's current law and Kirchoff's voltage law. **(5)**

Q5 a) Three similar coils each having resistance of 10 Ohms and reactance of 8 Ohm are connected in star, across 400 V, 3 phase supply. Determine (i) line current, (ii) total power, (iii) reading of each of two wattmeter connected to measure power. **(10)**

b) Explain the working principle of a 3 phase induction motor. **(5)**

Q6 a) Calculate the supply voltage V in the circuit shown. **(10)**



b) If a 6 pole induction motor supplied from a three phase 50 Hz supply has a rotor frequency 2.3 Hz, calculate (i) the percentage slip, (ii) the speed of the motor. **(5)**

