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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING**

**TEST - 1**

**Even Semester:** 2018-19

**Course Code:** EEE 101

**Course Name:** Elements of Electrical Engineering

**Programme & Sem:** B.Tech (Physics cycle) & II Sem

**Date:** 05 March 2019

**Time:** 1 Hour

**Max Marks:** 40

**Weightage:** 20%

**Instructions:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculators are permitted.

**Part A**

Answer **all** the Questions. **Each** question carries **four** marks. (3Qx4M=12)

1. State Kirchhoff's Voltage and Current law.
2. Briefly describe the Generation, Transmission and Distribution of power in Power System with a Single Line Diagram.
3. Define (i) Real Power (ii) Reactive Power, and (iii) Apparent Power as applied to single phase AC circuits. Draw the power triangle.

**Part B**

Answer **all** the Questions. **Each** question carries **eight** marks. (2Qx8M=16)

4. (a) The lamps in a set of Christmas tree lights are connected in series; if there are 20 lamps and each lamp has a resistance of  $25 \Omega$ , calculate the total resistance of the set of lamps, and hence calculate the current taken from a 230 V supply and power consumed.

(4M)

- (b) Find the phase angle between  $V_1 = -4\sin(377t+55^\circ)$  and  $V_2 = 5\cos(377t-65^\circ)$ . Does  $V_1$  lead or lag  $V_2$ ?

(4M)

5. An alternating voltage has the equation  $v = 500 \sin(314.15t + 22^\circ)$ ; what are the values of: (a) average Voltage (b) r.m.s. Voltage; (c) frequency; (d) at what time 't' the instantaneous voltage reaches 100V?

(8M)

**Part C**

Answer the Question. Question carries **twelve** marks. (1Qx12M=12)

6. Explain with a neat sketch the constructional features of a DC machine and mention the functions of each part.



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**PRESIDENCY UNIVERSITY  
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SCHOOL OF ENGINEERING**

**TEST - 2**

**Even Semester:** 2018-19

**Course Code:** EEE 101

**Course Name:** Elements of Electrical Engineering

**Program & Sem:** B.Tech & II Sem (Physics Cycle)

**Date:** 16 April 2019

**Time:** 1 Hour

**Max Marks:** 40

**Weightage:** 20%

**Instructions:**

- i. Read the question properly and answer accordingly.
- ii. Question paper consists of 3 parts.
- iii. Scientific and Non-programmable calculators are permitted.

**Part A**

Answer **all** the Questions. **Each** question carries **four** marks. (3Qx4M=12)

1. The frequency of the emf in the stator of a 4 pole induction motor is 50 Hz and that in the rotor is 1.5 Hz. What is the slip and at what speed the motor is running?
2. With necessary diagram enumerate the current, voltage and power relationship of DC series and Shunt generator.
3. Define Back EMF in DC motor? Write the Back Equation and Torque Equation of DC motor with usual notations.

**Part B**

Answer **both** the Questions. **Each** question carries **eight** marks. (2Qx8M=16)

4. a. A 4 pole DC shunt motor takes 22.5 A from a 250 V supply. The armature and shunt field resistances are 0.5  $\Omega$  and 125  $\Omega$  respectively. The armature is wave wound with 300 conductors. If the flux per pole is 0.02 Wb, Estimate (a) Speed, (b) Torque developed, and (c) Power developed by armature. (6 Marks)  
b. Mention the applications of different types of DC series and shunt motors. (2 Marks)
5. a. With neat schematic diagram explain the working principle of Transformer. (4 Marks)  
b. Obtain the comparison between core type and shell type transformer. (4 Marks)

**Part C**

Answer the Questions. The Question carries **twelve** marks. (1Qx12M=12)

6. a. A single phase, 20 KVA transformer has 1000 primary turns, and 2500 secondary turns. The net cross sectional area of the core is 100 cm<sup>2</sup>. When the primary winding is connected to 500 V, 50 Hz supply, calculate (i) the maximum value of the flux density in the core (ii) the voltage induced in the secondary winding and (iii) the primary and secondary full load currents. (4 Marks)  
b. List out the advantages of three phase induction motors. (4 Marks)  
c. List the various types of single phase Induction Motors with its one application for each type of motor. (4 Marks)

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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING**

**SUMMER TERM / MAKE UP END TERM EXAMINATION**

**Semester:** Summer Term 2019

**Date:** 24 July 2019

**Course Code:** EEE 101

**Time:** 2 Hour

**Course Name:** Elements of Electrical Engineering

**Max Marks:** 80

**Program & Sem:** B.Tech & I Sem (2017 & 2018 Batch)

**Weightage:** 40%

**Instructions:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculators are permitted.

**Part A**

Answer **all** the questions. **Each** question carries **five** marks.

(4Qx5M=20)

1. Mention any four important characteristics of measuring instruments.
2. State and explain Kirchhoff's laws.
3. The lamps in a set of Christmas tree lights are connected in series; if there are 20 lamps and each lamp has a resistance of  $25 \Omega$ , calculate the total resistance of the set of lamps, and hence calculate the current taken from a 230 V supply.
4. A meter used to measure the voltage reads 127.5 Volts and the corresponding value obtained from the computations is found to be 127.43 Volts. Identify and compute the Unknown.

**Part B**

Answer **all** the questions. **Each** question carries **ten** marks.

(4Qx10M=40)

5. What is Earthing? Draw and explain with a neat diagram the procedure for a pipe earthing and label the parts.
6. A) Briefly explain three different types of torques used in deflecting type Instruments (6M)  
B) Write a note on Safety aspects of Electrical Engineering? (4M)

7. Draw the block diagram of digital and virtual meters. Also write about advantages of each meter.
8. Draw the neat Diagram of a Moving Iron Instruments and name the parts. Write the Working Principle.

### **Part C**

Answer **both** the questions. **Each** question carries **ten** marks. (2Qx10M=20)

9. Draw the lay out and wiring Diagram for a part of the House with the following data:

Room No 1: 1 lamp Point, 1 fan Point, 1- 3 pin socket point

Room No 2: 2 Lamp Point, 1 fan Point, 1- 3 pin socket point

10. Explain the working of Energy meter with neat diagram.



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SCHOOL OF ENGINEERING

MAKE UP EXAMINATION JULY 2019

Semester: Summer Term 2018-19

Date: 24 May 2019

Course Code: EEE 101

Time: 3 Hours

Course Name: Elements of Electrical Engineering

Max Marks: 80

Program & Sem: B.Tech & II Sem (EVEN) (2018 Batch)

Weightage: 40%

**Instructions:**

- (i) *Read the question properly and answer accordingly.*
- (ii) *Question paper consists of 3 parts.*
- (iii) *Scientific and Non-programmable calculators are permitted*

**Part A**

Answer **all** the Questions. **Each** question carries **one** marks.

(20Qx1M=20M)

1. Select the appropriate answer for the following multiple choice questions.
  - i) Number of Parallel paths in the case of a Wave wound armature winding  
a.  $A=2$ .    b.  $A=P$ .    c.  $A=Z$ .    d.  $A=N$
  - ii) In a purely capacitive circuit, the current leads the voltage by  
a.  $90^{\circ}$     b.  $180^{\circ}$     c.  $270^{\circ}$     d.  $360^{\circ}$
  - iii) The Commercial Unit Of Electrical Energy Is----  
a.  $1\text{kwh} = 1 \text{ Unit}$     b.  $1 \text{ Watt Hour} = 1\text{unit}$     c.  $1\text{mwh} = 1 \text{ Unit}$     d.  $1\text{unit} = 230 \text{ Volts}$
  - iv) The D.C. Generator works on the principle of  
a. Faraday's laws of Electrolysis.    c. Lenz's Law  
b. Faraday's Laws of Electro Magnetic induction.    d. Ohm's Law.
  - v) The time taken by an alternating quantity to complete one cycle:  
a. Frequency    b. Angular velocity    c. Time period    d. Time constant
  - vi) By which of the following systems electric power may be transmitted?  
a. Overhead System    b. Underground System    c. Both (a) and (b)    d. None of the above
  - vii) During transmission, Voltages are stepped up or stepped down by a  
(a) Alternator    (b) D.C. Generator    (c) Transformer    (d) Induction Motor
  - viii) In case of megger the pointer's reading is zero when no resistance is connected at the terminals (True/False).
  - ix) The inductive reactance of an inductor is directly proportional to  
a. current    b. voltage    c. frequency    d. both a & c

- x) There are two a.c. signals with different frequencies. The time periods of these are---
- a. same    b. different    c. zero    d. infinity.
- xi) The active power consumed by a pure inductance connected to an a.c. voltage source is  
(a) very low (b) very high (c) zero (d) infinite
- xii) The Ohm's law cannot be applied to  
(a) resistance (b) inductance (c) Capacitance (d) diode
- xiii) The EMF induced in a D.C. Generator is given by:  
a.  $\phi ZNP / 60 A$     b.  $\phi ZNP / 60 P$     c.  $\phi ZNP / 60 * 2$     d.  $\phi ZNP / 60 * 4$
- xiv) It is required to convert mechanical Energy to Electrical Energy. Select the appropriate machine for this purpose:  
a. Motor b. Generator c. I.C.Engine d. Transformer
- xv) Which of the following rule is used to determine the direction of induced EMF in D.C generator?  
a. Coloumb's Law. b. Fleming's Right-hand Rule c. Lenz's Law d. Fleming's Left-hand Rule
- xvi) Power Factor Is: [Select The Incorrect Sentence]  
(a) Ratio of 'R' & 'Z' (b) Ration Of 'Z' & 'R' (c) Cosine Of The Angle Between Voltage & Current (d) Ratio Of Kw To Kva
- xvii) The Three Sides of The Impedance Triangle Of An R-L Series Circuit Are: (a) Resistance- Inductive Reactance- Impedance. (b) Resistance- Capacitice Reactance- Impedence. (c) Current, Voltage, Impedance. (d) Active Power, Reactive Power, Voltage
- xviii) In Star Connection The Line & Phese Voltages Are Same; (True/False)
- xix) Current leads the applied voltage in a pure inductive circuit: (True/false)
- xx) The relationship between rms value & the maximum value of a sinusoidal a.c. signal:  
(a) rms value =  $0.707 * \text{maximum value}$  (b) rms value =  $0.637 * \text{maximum value}$  (c) maximum value =  $0.707 * \text{rms value}$ . (d) Maximum value =  $0.637 * \text{rms value}$

### Part B

Answer **all** the Questions. **Each** question carries **ten** marks. (3Qx10M=30M)

2. a) Explain any four important characteristics of measuring instruments. (5M)  
b) Explain the three different types of torques used in deflecting type Instruments. (5M)
3. a) With a neat figure, explain the operation of an Induction Type meter. (6M)  
b) Explain the principle of operation of a single phase transformer. (4M)
4. Write the principle and operation of alternator and explain the types of alternator.

### Part C

Answer **all** the Questions. **Each** question carries **ten** marks.

(3Qx10M=30M)

5. Draw and explain with a neat diagram the procedure for a pipe earthing used for domestic earthing and label the parts.

6. Draw the lay out and wiring Diagram for a part of the House with the following data:

Room No 1: 1 lamp Point, 1 fan Point, 1- 3 pin socket point

Room No 2: 2 Lamp Point, 1 fan Point, 1- 3 pin socket point

7. a) A single phase, 20 KVA transformer has 1000 primary turns, and 2500 secondary turns. The net cross sectional area of the core is 100 cm<sup>2</sup>. When the primary winding is connected to 500 V, 50 Hz supply, calculate (i) the maximum value of the flux density in the core (ii) the voltage induced in the secondary winding and (iii) the primary and secondary full load currents.

(6M)

b) Show that the equivalent resistance of two resistors connected in parallel is the ratio of the product of those two resistances divided by the sum of those two resistance value.

(4M)







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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING**

**END TERM FINAL EXAMINATION**

Even Semester: 2018-19

Date: 24 May 2019

Course Code: EEE 101

Time: 3 Hours

Course Name: Elements of Electrical Engineering

Max Marks: 80

Program & Sem: B.Tech & II Semester (Physics Cycle)

Weightage: 40%

**Instructions:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non programmable calculators are permitted

**Part A**

Answer all the Questions. Each question carries one mark.

(20Qx1M=20M)

1. When a number of resistances are connected in parallel, the total resistance
  - a) Increases
  - b) decreases
  - c) First increases and then decrease
  - d) none of the above
- ii. The form factor of sinusoidal varying current is \_\_\_\_\_
  - a) 1.414
  - b) 1.11
  - c) 0.866
  - d) 0.707
- iii. \_\_\_\_\_ torque is useful in avoiding the Vibration of the pointer in deflecting type of instruments
  - a) Controlling
  - b) Gravity
  - c) Damping
  - d) Deflecting
- iv. The yoke of a DC generator is made of \_\_\_\_\_
  - a) Silicon steel
  - b) soft iron
  - c) Wrought iron
  - d) cast steel
- v. Earthing path always must provide \_\_\_\_\_ to the flow of current
  - a) High resistive path
  - b) protection
  - c) No path
  - d) Very low resistive path
- vi. A transformer changes \_\_\_\_\_
  - a) AC voltage only
  - b) DC voltage only
  - c) Both AC & DC voltages
  - d) none of these
- vii. Voltage Levels used for all the Domestic Installations are \_\_\_\_\_ Volts.
  - a) 230 & 440
  - b) 230 & 11,000
  - c) 440 & 11,000
  - d) 230 only
- viii. MCB is provided in the Circuit to \_\_\_\_\_ during high currents
  - a) to open the circuit
  - b) to short the circuit
  - c) to provide extra current
  - d) to reduce the overloading
- ix. In a three phase induction motor, the slip speed is given by \_\_\_\_\_
  - a)  $N_s$
  - b)  $N$
  - c)  $N_s - N$
  - d)  $N - N_s$
- x. Digital Instruments has \_\_\_\_\_ reading error.
  - a) Maximum
  - b) least
  - c) Very high
  - d) none of these
- xi. Virtual Instruments working as user defined Instruments need \_\_\_\_\_
  - a) Software only
  - b) Both Software and Hard ware
  - c) Hardware only
  - d) None of these

