

SEMESTER END EXAMINATION, DECEMBER-2019

Course Name : B.Tech

Semester : III

Paper Name : Basic Electrical Engineering

Paper Code : EE-101

Time : 3 Hrs.+20 minutes extra per hour for V.I. & examinees with writer. Max. Marks-70
अधि 0 अंक-70
समय : 3 घण्टे+20 मिनट प्रति घंटे अतिरिक्त-दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए।

Instructions :

- The question paper consists of three sections namely A, B & C. All sections are compulsory.
- Section A – Each question carries 2 marks. All questions are compulsory.
- Section B – Answer any 4 out of 6 given questions in maximum 100 (hundred) words. Each question carries 7 marks.
- Section C – Answer any 2 out of 3 given questions in maximum 500 (five hundred) words. Each question carries 16 marks.

निर्देश :

- प्रश्न पत्र में तीन खण्ड अ, ब व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड-अ में प्रत्येक प्रश्न दो अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड-ब में छः प्रश्नों में से किन्हीं चार प्रश्नों के उत्तर अधिकतम 100 (सौ) शब्दों में दें। प्रत्येक प्रश्न 7 अंक का है।
- खण्ड-स में तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 500 (पाँच सौ) शब्दों में दें। प्रत्येक प्रश्न 16 अंक का है।

Section – A (खण्ड-अ)

Multiple Choice Questions (बहुविकल्पीय प्रश्न)

5×2=10

1. Answer all the following questions.

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

- i) Conductance is reciprocal of:
- | | |
|----------------|-----------------|
| (a) resistance | (b) inductance |
| (c) reluctance | (d) capacitance |
- ii) Ohm's law is not applicable to :
- | | |
|---------------------------|---|
| (a) vacuum tubes | (b) carbon resistors |
| (c) high voltage circuits | (d) circuits with low current densities |

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iii) The ratio of voltage and electric current in a closed circuit :

- (a) remains constant
(b) varies
(c) increases
(d) falls

iv) Which of the following is not correct ?

- (a) $P = V/R^2$
(b) $P = VI$
(c) $I = \sqrt{(P/R)}$
(d) $V = \sqrt{(P/R)}$

v) A D.C. generator works on the principle of :

- (a) Lenz's law
(b) Ohm's law
(c) Faraday's law of electromagnetic induction
(d) none of the above

Section - B (खण्ड-ब)

Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any four of the following questions in maximum 100 words.
 $4 \times 7 = 28$

निम्नलिखित में से किन्हीं चार प्रश्नों के उत्तर अधिकतम 100 शब्दों में दें।

- Derive the emf equation of Transformer.
- Draw the phasor diagram of and equivalent circuit of single phase transformer.
- Explain the working principle of a 3 phase induction motor.
- Explain the working principle of PMMC instruments.
- A parallel RLC circuit has an adjustable capacitor for charging the resonant frequency from 540 to 1610kHz. The maximum value of Q_0 is to be 50. If $R = 35\Omega$, specify L , C_{\max} and C_{\min} .

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[4]

vi) An RLC series circuit has resonance frequency of 1000Hz. its power factor reduces to 0.707 at a frequency of 1050Hz. Calculate its quality factor.

Section - C (खण्ड-स)

Long Answer Questions (दीर्घ उत्तरीय प्रश्न)

3. Answer any two of the following questions in maximum 500 words.
 $2 \times 16 = 32$

निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 500 शब्दों में दें।

- Describe the construction details of transformer and also explain the principle of operation.
- State and explain Superposition & Maximum power Transfer Theorem.
 - State and explain Kirchhoff's Voltage & Kirchhoff's current law.
- Find the RMS value, Average value, form factor and peak factor of sinusoidal ac supply.

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[3]