| ET-202(B) |

**B.Tech. Civil (Construction Management) /
B.Tech. Civil (Water Resources Engineering)**

Term-End Examination

00883 **June, 2018**

**ET-202(B) : PRINCIPLES OF ELECTRICAL
SCIENCES**

Time : 3 hours *Maximum Marks : 70*

*Note : Attempt any **five** questions. Use of scientific
calculator is allowed. Missing data, if any, may be
suitably assumed.*

1. (a) Explain the following : $2 \times 3\frac{1}{2} = 7$

   (i) Kirchhoff's current law, and

   (ii) Kirchhoff's voltage law.

   (b) Explain the maximum power transfer
   theorem and find out its efficiency. 7

2. (a) Explain the importance of sinusoidal signals.
   Also find the effective value and form factor. 7

   (b) What is the three-phase system ? Explain its
   merits over single-phase system. 7

3. (a) Define System. Explain and draw the block diagrams which represent the following systems : 7

   (i) Spring

   (ii) R-C Network

   (iii) Voltage Controlled Voltage Source (VCVS) System

(b) What is an Ideal Transformer ? Explain the working principle of transformer with neat diagram. 7

4. (a) Explain open and short circuit test for 1-ϕ transformer. 7

(b) Explain the construction and working of DC Generators. 7

5. (a) Write short notes on any *two* of the following : $2 \times 3\frac{1}{2} = 7$

   (i) Relative merits of Analog and Digital instruments.

   (ii) Various interrupts in 8085 microprocessor.

   (iii) Multiplexer and its application.

(b) A 3-phase, star connected alternator is rated for 5000 kVA, 50 Hz, 5 kV, 150 rpm. It has negligible armature resistanee and a synchronous reactance $X_s = 1.5 \, \Omega$.

Find the induced emf and torque angle when the machine is supplying full-load current at rated voltage at (i) unity p.f; (ii) 0.8 p.f. lag. 7

6. (a) Explain the working of the following devices with neat diagram : 7

(i) Rectifier

(ii) Voltage Multiplier

(b) Explain CMOS inverter with the help of its characteristics. 7

7. (a) Explain the conversion process of the following base with suitable example : 7

(i) Binary to Hexadecimal

(ii) Hexadecimal to Binary

(iii) Binary to Octal

(iv) Octal to Hexadecimal

(b) How can you perform memory address decoding ? Explain with suitable example. 7.

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