No. of Printed Pages : 4

ET-202(B)

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

Term-End Examination

00508

December, 2017

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 may be suitably assumed.*

1. (a) Discuss the following : *5×2=10*

(i) Kirchhoff's Voltage Law (KVL)

(ii) Maximum power transfer theorem

(iii) Power factor

(iv) Merits of 3-phase system

(v) Feedback system

(b) Find the equivalent resistance (R_{AB}) shown in Figure 1. *4*

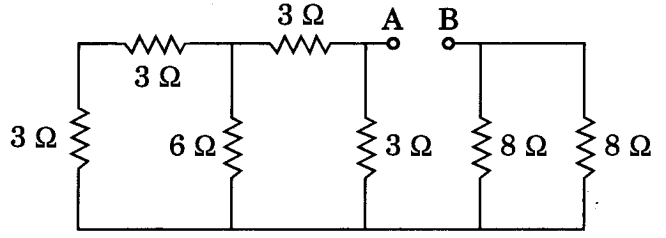

Figure 1

2. (a) A 3-phase balanced load has per phase impedance $Z_p = (3 + j4)$ ohm and it is star-connected. The supply voltage is 400 volt. Calculate : *6*

(i) Phase voltage

(ii) Line current

(iii) Power in 3-phase load

(b) Calculate the maximum power dissipated by resistance R in Figure 2. *8*

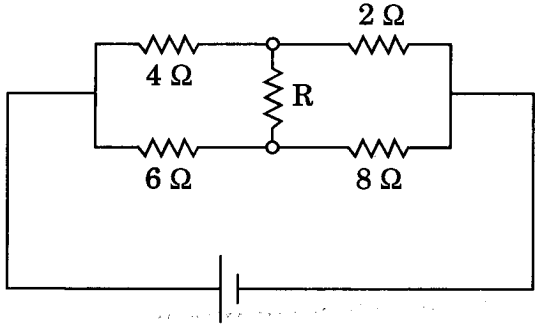

Figure 2

3. Discuss the following : $4 \times 3\frac{1}{2} = 14$

   (a) Principle of Transformer Operation

   (b) Load Characteristics of DC Generators

   (c) Universal Motor

   (d) Braking of DC Motors

4. (a) Draw and explain the equivalent circuit of a transformer referred to secondary side. 7

   (b) Explain the Ward-Leonard method for speed control of a DC motor. 7

5. Discuss the following : $4 \times 3\frac{1}{2} = 14$

   (a) Regulated DC Power Supply

   (b) CMOS Inverter

   (c) Log Amplifier

   (d) Monostable Multivibrators

6. (a) Design a phase-shift oscillator for a frequency of 10 kHz. 4

   (b) Draw a four-input OR-gate circuit using diode and write its truth table. 6

   (c) Write the applications of CRO. 4

7. Explain the working and applications of the following : $2 \times 7 = 14$

   (a) Analog-to-Digital Converters

   (b) 8085 Microprocessor

8. (a) Define Interrupts. Explain various interrupts in 8085 microprocessor. *7*

(b) Design a memory circuit to interface a 4 kbyte RAM to an 8085 microprocessor with starting address 7000_H. *7*
