

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

Term-End Examination

December, 2012

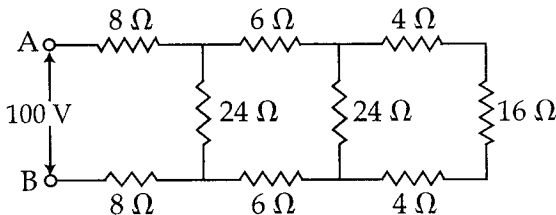
**ET-202(B) : PRINCIPLES OF ELECTRICAL
SCIENCES**

Time : 3 hours

Maximum Marks : 70

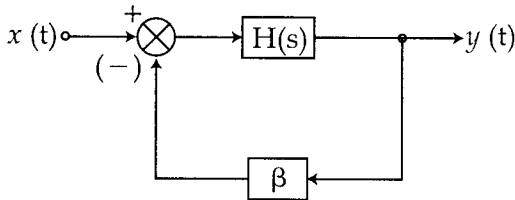
Note : Answer any five questions in all. Use of calculator is permitted.

1. (a) What do you mean by low power factor ? 6
What is the necessity for power factor correction ?
- (b) State and explain Superposition Theorem. 6
Give an example using circuit diagram.
- (c) Define Power and Energy with expressions. 2
2. (a) Calculate : 6
 - (i) the equivalent resistance across the terminals of the supply
 - (ii) total current, and
 - (iii) current delivered to 16 ohms resistor in the circuit shown below :



- (b) Write principle of operation of a single phase transformer and also draw its equivalent circuit diagram. 6
- (c) Draw speed-torque curve of a dc Shunt Motor. 2
3. (a) Explain the distinction between analog and digital instruments and their relative merits. 6
- (b) Draw simplified functional diagrams of the type of distribution systems used for : 6
- (i) a small unit such as a house and
- (ii) larger units such as commercial establishments or industry.
- (c) Three loads, each of resistance 30Ω , are connected in star to a 415 V, 3-phase supply Determine : 2
- (i) the system phase voltage,
- (ii) the phase current and
- (iii) the line current
4. (a) Two wattmeters are connected to a 3-phase motor indicate the total power input to be 12 kW. The power factor is 0.6. Determine the readings of each wattmeter. 6
- (b) Write short note on the following (*any 2*) : 6
- (i) impedance, power, phase angle
- (ii) any four applications of p-n junction diode
- (iii) various interrupts in 8085 microprocessor
- (c) What is a Multiplexer ? 2

5. (a) What are the addressing modes available in 8085 microprocessor ? 6
 (b) Discuss the different kinds of logic gates used in digital circuit. 6
 (c) Find decimal equivalent of $(1001011)_2$ 2
6. (a) Explain any three applications of op-amp with relevant circuit diagram. 6
 (b) Explain the working of a dual slope integrating type ADC. 6
 (c) Draw block diagram and truth table of an R-S clocked flip-flop. 2
7. (a) Determine the system transfer function for the system shown below : 6



and hence, find the system transfer function for a unity feedback system employing negative feedback.

- (b) Draw the complete circuit of a bipolar junction transistor (BJT) differential amplifier. 6
 (c) What are the applications of CRO ? 2