Pokhara University

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| Level: Bachelor | Semester – Fall | Year : 2012 |
| Programme: BE | | Full Marks: 100 |
| Course: Basic Electrical Engineering | | Pass Marks: 45 |
| Time : 3hrs. |

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| *Candidates are required to give their answers in their own words as far as practicable.* |
| *The figures in the margin indicate full marks.* |
| Attempt all the questions. |

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|  | 1. Describe in brief the generation, transmission, distribution and consumption of electrical energy by domestic, industrial and commercial consumers.   **OR**  Explain the principle of operation of single phase energy meter.   1. Find the value of the voltage sources (Vs) that delivers 2 Amps current through the circuit as shown in figure below.     1Ω  1Ω | 7  8 |
|  | 1. Find all the mesh currents in the given circuit.     **OR**  For the circuit shown in figure, find the current through RL = R2= 1Ω resistor (Ia-b branch) using Thevenin's theorem.    R4=2Ω   1. For the circuit shown in figure, find the value of RL that absorbs maximum power from the circuit and the corresponding power under this condition.     **OR**  Find Norton’s equivalent circuit of the given network as viewed from AB. | 7  7  8 |
|  | 1. Find the average value, rms value and form factor for a full wave rectified sinusoidal waveform. 2. Explain the sinusoidal response of RLC series circuit. | 7  8 |
|  | 1. A coil of inductance 0.08H and negligible resistance is connected in series with a 15 Ω non-inductive resistance. The combined circuit is energised from a 240 V, 50 Hz supply. Calculate: 2. Reactance of the coil v) Impedance of the circuit 3. Current in the circuit vi) Voltage across the resistance 4. Voltage across the coil vii) Power absorbed by the   circuit   1. Power factor of the circuit 2. Three similar coils, each having a resistance of 20 Ω and an inductance of 0.05H are connected in star to a 3-phase , 50 Hz supply with 400V between lines. Calculate the total power absorbed and the line current in each case. Find the magnitude of current flowing in the neutral wire. | 7  8 |
|  | 1. What are the advantages of three- phase over single- phase ac system? Explain the measurement of three phase power by two wattmeter method. 2. Explain the operation of single phase transformer on NO-LOAD condition. Draw appropriate phasor diagram.   **OR**  A 5KVA, 250/500 V transformer gave the following test results:  O.C. test: 20V; 12A; 100W: with secondary open circuited S.C. test: 250V; 1A; 80W: with primary short circuited  Draw equivalent circuit of transformer referred to primary with respective circuit constants. | 3+5  7  7 |
|  | 1. Explain how electrical energy is converted to mechanical rotation in DC motor. 2. Explain the principle of operation of three phase induction motor.   **OR**  List down the uses of induction motor and synchronous motors. | 8  7  7 |
|  | Write short notes on **any two:**   1. Power factor and its significance 2. Speed control of dc motor 3. Basic requirements of measuring instruments 4. Color coding of resistor | 2×5 |