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ET-202(B)

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

01465

Term-End Examination

June, 2014

ET-202(B) : PRINCIPLES OF ELECTRICAL SCIENCES

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any* ***five*** *questions. Symbols and abbreviations have their usual meaning. Use of calculator is permitted.*

1. (a) State and explain Thevenin's theorem with suitable example. *7*

(b) Explain the (i) star to delta and (ii) delta to star conversion. *7*

2. (a) What is the function of a neutral wire in a 3-phase 4-wire system ? What current does it carry in a balance system ? *6*

(b) A system has H(s) = 1/(s + 2). Negative feedback is employed with a feedback factor. Find the system function with feedback and also write the advantage of negative feedback. *8*

3. (a) What are the different torques required in an indicating type instrument ? Draw and explain the working of attraction type moving iron instrument. *8*

(b) Write short notes on any ***two*** : *3×2=6*

(i) PMMC instrument.

(ii) Accuracy and resolution of an instrument.

(iii) Rectifier instrument.

4. (a) An electric motor is given an electric supply of 100 kW. It drives a mechanical load of constant torque at a speed of 1000 rpm. If the electromagnetic losses are 3·5 kW and the mechanical losses are 1·8 kW, find : *8*

(i) The mechanical power output

(ii) Output torque

(iii) Efficiency

(b) Write short notes on any ***two*** : *3×2=6*

(i) Open and short circuit test in a single phase transformer.

(ii) Efficiency and losses in transformer.

(iii) Equivalent circuit refers to primary or secondary.

5. (a) Draw the V – I characteristics of a diode. An ideal diode is in series with a 1 kV resistor. A 5 V battery is applied to the network so as to forward bias the diode. Determine current through the diode. *6*

(b) Explain the transistor as controlled switch and as an amplifier. *8*

6. (a) Draw and explain the Wein bridge oscillator. Design a Wein bridge oscillator for a frequency of 1 kHz. 7

(b) Differentiate between astable and monostable multivibrator and explain them in brief. 7

7. (a) Explain following instructions in a microprocessor : 6

(i) XTHL

(ii) RIM

(iii) DAD B

(iv) RRC

(b) Explain : 8

(i) Interrupts

(ii) Serial I/O

(iii) Direct Memory Access

8. (a) Convert R-S Flip-flop into D Flip-flop and explain. 7

(b) Implement XOR Gate using Universal Gate. 7