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**University Examinations 2014/2015**

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR DIPLOMA IN ELECTRICAL ENGINEERING

**EEE 2204: ELECTRONICS II**

**DATE: OCTOBER 2015 TIME: 11/2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. List three equipments that uses direct current for their/its operation. (3 Marks)
2. Draw waveform to distinguish regulated power supply from un-regulated. (4 Marks)
3. Define rectification. (2 Marks)
4. List two types of rectifier circuit. (2 Marks)
5. An alternating current supply of 240V is applied to a half wave single wave rectifier circuit through a transformer of turn ratio 7:1 shown below

Find direct current output voltage. (4 Marks)

1. Name the features of integrated circuit voltage regulators. (4 Marks)
2. Outline the difference between positive and negative feedback amplifier. (4 Marks)
3. Draw an operational amplifier symbol. (2 Marks)
4. Define the following terms:
5. Slew rate. (1 Mark)
6. Common mode rejection ratio (1 Mark)
7. An Op-Amp has CMRR of 70dB 20,000. Calculate its common mode gain. (3 Marks)

**QUESTION TWO (20 MARKS)**

1. List two applications of operational amplifier. (2 Marks)
2. Describe the operation of one of the listed application above of the operational amplifier (OP-AmP). (5 Marks)
3. With aid of circuit diagrams explain the connection of an operational amplifier to act as an amplifier. (8 Marks)

**QUESTION THREE (20 MARKS)**

1. The gain with negative feedback is reduced by a factor ­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_ and if the loop gain is large compared to unity that is  the desired closed loop gain is given by \_\_\_\_\_\_\_\_\_\_ (2 Marks)
2. Show that the closed loop gain with feedback is given by  (6 Marks)
3. With help of graphs show that bandwidth increase with negative feedback. (4 Marks)
4. An amplifier has open loop gain of 800 and a feedback of 0.01. If the open loop gain changes by 20% due to temperature. Find the percentage change in closed loop gain. (3 Marks)

**QUESTION FOUR (20 MARKS)**

1. Describe how voltage regulator can be converted into an adjustable regulator. (3 Marks)
2. The zener diode in the figure below had the following ratings:



1. What would be the load voltage when the load current  varies from 10mA to 120MA? (4 Marks)
2. Also calculate voltage regulation of the regulator. (2 Marks)
3. With the help of a circuit diagram describe the operation of full wave rectifier with centre tapped transformer. (5 Marks)