

**F.Y. B. SC. (COMPUTER SCIENCE) SEM –II (CBCS - 2016
COURSE) : WINTER - 2017
SUBJECT: PRINCIPLES OF ANALOG ELECTRONICS – II**

Day: **Wednesday**
Date: **01/11/2017**

W-2017-0713

Time: **03.06 PM TO 06.00 PM**
Max. Marks: 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw diagrams **WHEREVER** necessary
- 4) Use of scientific **CALCULATOR** is allowed.

- Q.1** A) Select the correct option and rewrite the complete sentence. **(06)**
- a) OP-AMP as comparator is also called as _____.
- i) Photo voltaic detector ii) Voltage level detector
 iii) Voltage level destroyer iv) None of the above
- b) In case of differential amplifier _____ is considered as balanced amplifier.
- i) Single ended input single ended output
 ii) Double ended input single ended output
 iii) Single ended input double ended output
 iv) Double ended input double ended output
- c) For a Wein bridge oscillator $R_1=R_2= 100k\Omega$ and $C_1=C_2=10pF$ then the frequency of oscillations is _____.
- i) 159.1KHz ii) 160KHz
 iii) 200.1kHz iv) 164Hz
- d) CMRR stands for _____.
- i) Common mode rejection ratio
 ii) Common module rejection ratio
 iii) Common module rate ratio
 iv) Common mode rate ratio
- e) Full form of SMPS is _____.
- i) Switch means power supply
 ii) Safe mode power supply
 iii) Switch mode power supply
 iv) Safe means power supply
- f) Colpitt's oscillator is _____ type of oscillator
- i) RC ii) LC iii) RL iv) None of the above
- B)** Answer all the questions in one sentence. **(06)**
- a) State any two applications of UPS.
- b) Which type of feedback is used in inverting amplifiers?
- c) Define CMRR for OP-AMP.
- d) State the various blocks of a regulated power supply.
- e) Draw output waveform if input to OP-AMP as integrator is square wave.
- f) Give any two ideal characteristics of an OP-AMP.
- Q.2** Answer any **THREE** of the following: **(12)**
- a) i) Draw well- labeled diagram for OP-AMP as subtractor.
 ii) In a subtractor circuit using OP-AMP, the input resistance is $47 k\Omega$ and the feedback resistance is $100K\Omega$. If the value of input voltages are $0.49V$ and $0.68V$. Find the output voltage.
- b) Explain the Barkhausen criterion for sustained oscillations.
- c) State the explain four characteristics of OP-AMP.
- d) i) Draw well labeled diagram for single ended input double ended output differential amplifiers.
 ii) State any one application of differential amplifier.

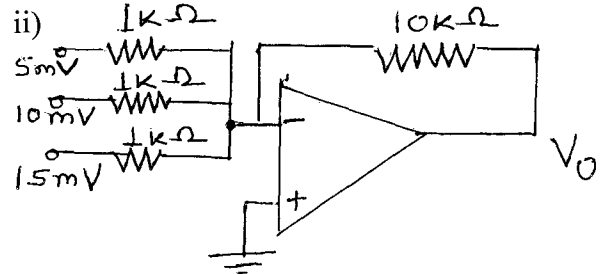
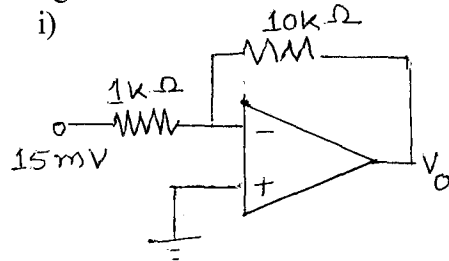
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Q.3 Answer any **FOUR** of the following: **(12)**

- a) Give three points of comparison between RC and LC oscillators.
- b) i) State the advantages of RC phase shift oscillator.
ii) Let $C=0.001 \mu\text{F}$, then calculate the value of R for the frequency of 1KHz for R-C phase shift oscillator.
- c) Define the following terms for power supply.
 - i) Load regulation
 - ii) Line regulation
 - iii) Terminal voltage
- d) Explain the following terms with respect to differential amplifier.
 - i) Differential gain
 - ii) Common mode gain
 - iii) Input- bias current
- e) Draw block diagram representation of an operational amplifier.

Q.4 Answer any **TWO** of the following: **(12)**

- a) Determine the gain of following operational amplifier circuit and the output voltage.



- b) Draw and explain the diagram for double ended input double ended output differential amplifier with constant current source.
- c) With neat diagram explain the working of Hartley oscillator. Also state the equation for its output frequency.

Q.5 Answer any **TWO** of the following: **(12)**

- a) Draw block diagram of SMPS and explain its working in detail.
- b) i) With neat diagram explain the working of OP- AMP as differentiator.
ii) Also draw waveform if input applied is square wave.
- c) Draw and explain the block diagram of ON- Line UPS.

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