

BACHELOR OF SCIENCE (COMPUTER SCIENCE) (CBCS - 2018 COURSE)
F.Y.B.Sc.(Computer Science) Sem-II :SUMMER- 2022
SUBJECT : PRINCIPLES OF ANALOG ELECTRONICS-II

Day : Monday
 Date : 11/7/2022

S-20082-2022

Time : 11:00 AM-02:00 PM
 Max. Marks : 60

N.B

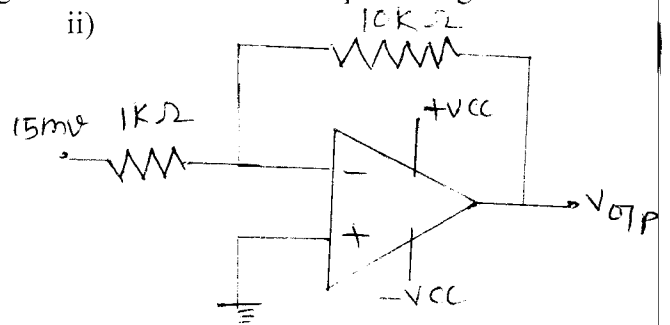
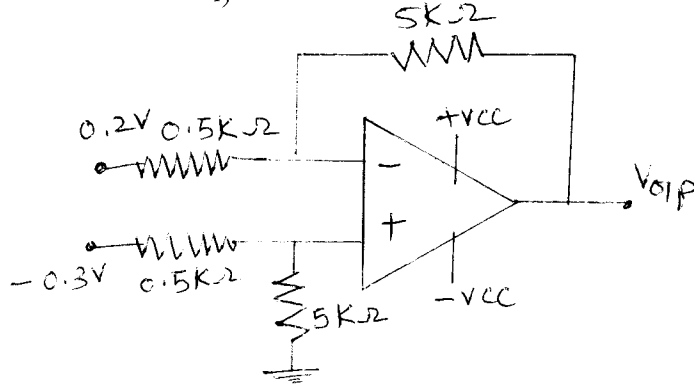
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use to the Scientific **CALCULATOR** is allowed.
- 4) Draw diagrams **WHEREVER** necessary.

Q.1 Answer any **TWO** of the following: **(12)**

- a) What is a differential amplifier? Explain double-ended-input-double-ended-output differential amplifier with neat diagram. Also write voltage gain equation for it.
- b) With neat diagram show that the output of subtractor circuit using OP-AMP is directly proportional to the difference in the input signal.
- c) i) Draw block diagram of SMPS and explain the function of each block.
 ii) State any two applications of it.

Q.2 Answer any **TWO** of the following: **(12)**

- a) Identify the following OP-AMP configurations and find their output voltage:



- b) With necessary diagram explain the two operating modes of ON-Line UPS.
- c) i) Draw and explain neat diagram for phase shift oscillator.
 ii) Calculate frequency of oscillation of phase shift oscillator if $R = 10\text{ K}\Omega$ and $C = 0.1\ \mu\text{F}$.

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

- a) Explain the use of OP – AMP as inverting amplifier and obtain an expression for its voltage gain.
- b) Explain Wein Bridge oscillator with necessary diagram. State its equation for oscillations.
- c) Draw and explain the block diagram of OP-AMP.

P.T.O.

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

- a) In a colpitt's oscillator in the tank circuit C_1 is the capacitor connected as load and C_2 in the feedback. $C_1 = 0.001\mu\text{F}$ and $C_2 = 0.01\mu\text{F}$. The inductor in the tank circuit is $20\mu\text{H}$. Find the frequency of oscillation and feedback fraction.
- b) Explain the concept of virtual ground in OP-AMP.
- c) Explain what will happen at the output of an oscillator circuit if:
i) $A\beta = 1$ ii) $A\beta < 1$ iii) $A\beta > 1$
- d) Explain the action of OP- AMP as comparator with necessary diagram.

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

- a) For a differential amplifier, if input bias current is 80 nA and input offset current is 20 nA . Calculate each base current.
- b) Define any three parameters of an OP-AMP.
- c) Define feedback. Explain positive and negative feedback.
- d) Explain the following terms related to UPS:
i) Transition time ii) Back-up time iii) Efficiency
- e) Draw diagram for OP-AMP as integrator. State equation for its output.
- f) Define the following specifications of a regulated power supply:
i) Load regulation ii) Line regulation

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