

B.Sc 4 th Semester (Honours) Practical Examination, 2021

PHYSICS

(Analog Systems and Applications Lab)

Course ID: 42423

Course Code: SHPHS/403/C-10

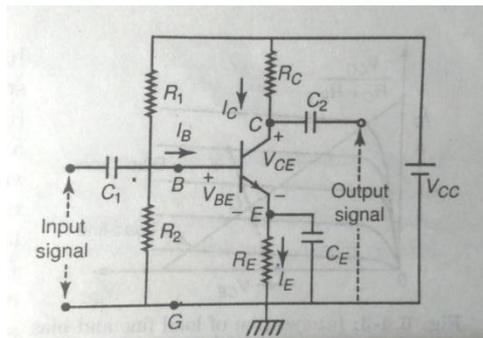
Time: 1 Hour

Full Marks: 15

Answer any three questions

5×3=15

- (a) Why is CE configuration widely used in amplifier circuit?
(b) Consider the voltage divider bias circuit of fig. given below. Assuming $\beta=260$, $V_{CC}=12\text{ V}$, $R_c=560\Omega$, $R_E=680\Omega$, $R_1=22\text{ k}\Omega$ and $R_2=12\Omega$. Find I_B , V_{CE} .



2+3

- (a) Derive the expression of the high frequency gain of a single stage RC coupled amplifier
(b) Why do we neglect the junction capacitance in low frequency signal analysis?

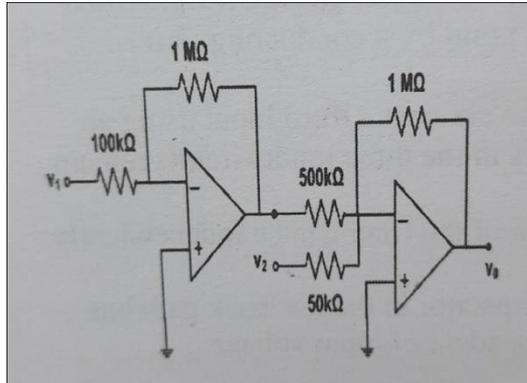
4+1

- (a) Draw a pin diagram of an OP-AMP.

(b) What do you mean by offset voltage of a practical OP-AMP circuit?

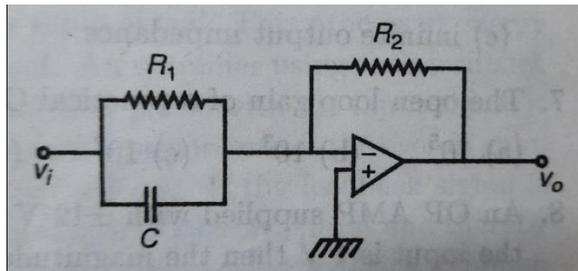
- (c) Two input voltages v_1 and v_2 of the circuit shown in fig below are 200 mV and 100 mV respectively. Find out the value of output voltage v_0 .

1+1+3



4. (a) For the circuit of the figure given below show that the output voltage is

$$v_0 = -\frac{R_2}{R_1} v_i - CR_2 \frac{dv_i}{dt}$$



(b) Suppose a sinusoidal signal $v_s = 10\sin 2000\pi t$ mV is applied to the input of the OP-AMP integrator with $R=1\text{ M}\Omega$ and $C=1\text{ }\mu\text{F}$. Find the output voltage. 3+2

5. (a) Draw a circuit using one or more OP-AMP whose output v_0 is given by $v_0 = 4v_1 + 6v_2$

(b) A moving coil meter is connected in the negative feedback path of an OP-AMO as shown in the figure given below. The meter shows full scale deflection when a current of $100\text{ }\mu\text{A}$ passes through it. Find the value of R such that the full scale deflection is obtained with $v_i = 10\text{ V}$ 3+2

