S.C.No.—M/19/0702403/7405

M. Sc. EXAMINATION, May 2019

(Fourth Semester)

Main/Re-appear

Batch 2017/2016

PHYSICS

MSP403

Electronics–II

Time : 3 Hours]   [*Maximum Marks : 80*

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) Briefly describe *pn* junction photodiode.
   (b) Differentiate between Analog and digital transducers with examples.
   (c) Explain op-amp as non-inverting summing amplifier.
   (d) Describe op-amp as sample and hold circuit.   4×4=16

Unit I

2. Explain the following :   16
   (a) Light Emitting Diode
   (b) P-I-N Photodiode.

3. (a) Explain *pn* junction photo diode and photo transistor and differentiate between the two in term of amplification of the input signal.   8
   (b) Using diagram, discuss the process of amplification of photocurrent using photo multiplier tube.   8

Unit II

4. (a) Discuss temperature measurement using thermocouple. Which materials are used for the formation of thermocouple. What are the errors that occur that during the measurement using a thermocouple ? 8

H 0702403/7405

(b) Explain how a ballistic galvanometer is used to measure flux changes occurring in in magnetic circuits and indicate the essential conditions to be satisfied by the ballistic galvanometer chosen for this purpose. **8**

5. Explain using diagram, Seismic transducer for the measurement of vibrations. Give its theory. **16**

Unit III

6. (a) Find the value of R if V_1 and V_2 are amplified by same amount. Assume op-amp to be ideal. **8**
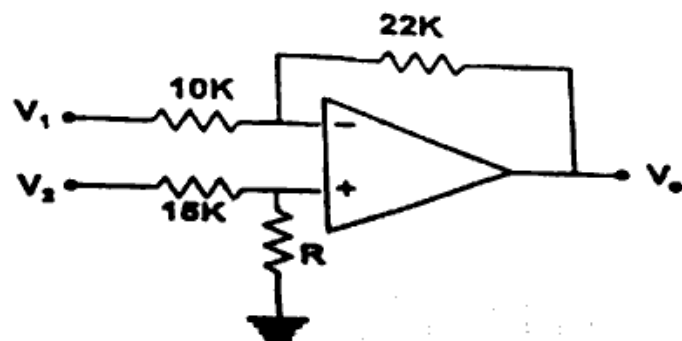
(b) Draw the schematic diagram of an ideal OP-AMP with voltage series feedback in inverting and non-inverting mode and hence drive the expression for the closed loop gain in each case. **8**

7. (a) Explain with circuit diagram how the emitter coupled differential amplifier can be made independent of the temperature. **10**

(b) Find the output voltage as the function of time, assume $A_V = \infty$. **6**
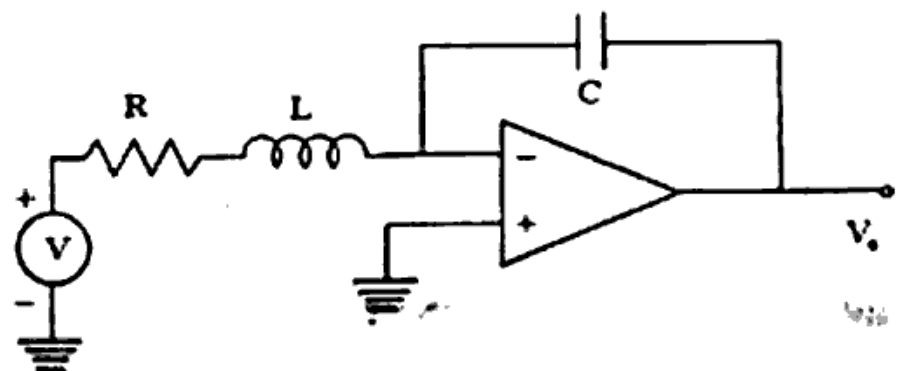
Unit IV

8. (a) Describe temperature compensated logarithmic amplifier. **6**

(b) Describe op-amp as second order high pass Butterworth filter and derive its relation for closed loop gain. **10**

(a) Describe weight resistor type digital to analog converter along with its digitally control switch. **8**

(b) Sketch the regenerative comparator system and explain its operation. Which parameters determine the loop gain and hysteresis ? Sketch the transfer characteristics and indicate the hysteresis. **8**