TED (15/19) – 3031
(Revision – 2015/19)

A23 -09538

Reg.No……..
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE , APRIL – 2023

ANALOG DEVICES AND CIRCUITS

(Maximum Marks : 100) (Time : 3 hours)

PART – A
(Maximum Marks : 10)

Marks

I. Answer **all** questions in one or two sentences. Each question carries 2 marks.

1. Specify the importance of filter circuit in a dc power supply unit.
2. Mention any two advantages of negative feedback in amplifiers.
3. Write down the Barkhausen's criterion for obtaining sustained oscillations from an oscillator.
4. List out any two applications of multivibrators.
5. Draw the circuit diagram of a voltage follower using op-amp.

(5x2=10)

PART – B
(Maximum Marks : 30)

II. Answer any **five** of the following questions. Each question carries 6 marks.

1. With neat circuit diagram and waveforms explain operation of a negative clamper circuit using diodes.
2. Illustrate how a zener diode helps to regulate a variable supply voltage.
3. Explain the classification of power amplifiers based on mode of operation or period of conduction.
4. Why do we cascade amplifiers? What are the various coupling schemes used for cascading amplifiers?
5. Explain the working of an astable multivibrator using BJT.
6. Describe the working of a Schmitt trigger using op-amp. Draw necessary circuit-diagram and waveforms.
7. Draw the symbol of 741 IC op-amps and name its terminals. Define the concept of virtual ground in op-amp circuits.

(5x6=30)

PART – C

(Maximum Marks : 60)

(Answer **one full** question from each unit. Each full question carries 15 marks)

UNIT – I

III. (a) Describe the working of a half wave rectifier and state the value of its ripple factor and rectification efficiency fed with input voltage Vm sinwt. (8)

(b) Discuss the operation of voltage regulator IC 7805 and mention few applications. (7)

OR

IV. (a) Compare half wave and full wave rectifiers. (8)

(b) Explain the operation of a rectifier circuit using π-filter. (7)

UNIT – II

V. (a) Explain working of class B push pull power amplifier. (8)

(b) Define the terms bandwidth and cut off frequencies with the help of frequency response curve of an amplifier. Why do we define cut off frequencies as half power frequencies? (7)

OR

VI. (a) Explain the concept of direct coupling in amplifier operation. Mention few applications of direct coupling. (8)

(b) Compare positive and negative feedback system. (7)

UNIT –III

VII. (a) With neat circuit diagram explain working of RC phase shift oscillator. (8)

(b) Compare the working of amplifier and oscillator. (7)

OR

VIII. (a) Discuss the working Hartley oscillator with the help of neat circuit diagram. (8)

(b) Describe how a 555 IC can be configured to develop a monostable multivibrator. (7)

UNIT – IV

IX. (a) Define following terms and write down their typical values for a 741 IC op amp.
(i) Input resistance (ii) CMRR (iii) Slew rate (iv) Input bias current. (8)

(b) Draw and explain the operation of a comparator using op amp. Modify the comparator to draw the circuit diagram of a zero crossing detector. (7)

OR

X. (a) Describe inverting op amp configuration with necessary circuit diagram and derive the expression for voltage gain. (8)

(b) Illustrate how an op amp IC can be used to design integrator and differentiator circuits. (7)

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