

GANPAT UNIVERSITY
B.TECH SEM. III (ELECTRICAL ENGINEERING)
REGULAR EXAMINATION NOV-DEC 2015
2EE 303: ANALOG ELECTRONICS

TIME: 3 HRS

TOTAL MARKS: 60

Instructions:

- (1) This Question paper has two sections. Attempt each section in separate answer book.
- (2) Figures on right indicate marks.
- (3) Be precise and to the point in answering the descriptive questions.

SECTION-I

- Q. 1 (A) What do you understand by a clamping circuit? With neat diagrams explain the action of a (i) positive clamper (ii) negative clamper. (04)
- (B) With a neat sketch, explain the working of Centre-tap full-wave rectifier. (04)
- (C) Draw and explain the equivalent circuit of a diode. (02)

OR

- Q. 1 (A) Give the roles of capacitor in amplifier. Draw and explain RC coupled amplifier. (04)
- (B) Define amplifier. Classify different types of amplifier. (04)
- (C) Mention the different types of transistor configurations. Only draw the circuit diagram of each type of transistors (02)
- Q. 2 (A) Draw and Explain the input and output characteristics of a transistor in CE configuration. Indicate cut-off, active and saturation regions. (03)
- (B) List the different methods of biasing of transistor. Explain any one in detail. (04)
- (C) In a common base connection, the emitter current is 1mA. If the emitter circuit is open, the collector current is 50 μ A. Find the total collector current. Given that $\alpha = 0.92$. (03)

OR

- Q. 2 (A) Explain the basic construction of an enhancement type MOSFET. Draw and explain its characteristics. (04)
- (B) Explain how to determine drain characteristics of JFET? What do they indicate? (04)
- (C) Compare BJT and JFET. (02)
- Q. 3 Do as Directed
- (A) Explain the construction and working of JFET. (03)
- (B) Write short note on Light-Emitting Diode (LED). (03)
- (C) What do you mean by negative feedback? Draw block diagram of various types of Negative feedback. (04)

SECTION-II

- Q. 4 (A) Derive the equation of gain with feedback (A_f) and input resistance with feedback (R_{if}) for inverting amplifier with feedback. (05)
- (B) Design a practical differentiator circuit to properly process input of $14 \sin(3141t) \text{ mV}$ (05)

OR

- Q. 4 (A) With help of neat sketch illustrate a low pass active filter using op-amp. (05)
- (B) Draw a neat sketch of integrator and derive the equation of output voltage for integrator. (04)
- (C) Draw the equivalent circuit and transfer curve of op amp. (01)
- Q. 5 (A) Draw internal circuit diagram of IC 555. Briefly discuss function of each pin. (04)
- (B) Using LM 317, design an adjustable voltage regulator to get variable output voltage $V_O = 12 \text{ V}$ to 15 V and $I_O = 0.50 \text{ A}$. Draw a complete schematic diagram of same. (04)
- (C) Draw a complete circuit diagram of fixed 12 V DC voltage regulator. (02)

OR

- Q. 5 (A) Discuss operation of IC 555 as a monostable multivibrator. (05)
- (B) What is a voltage regulator? Briefly discuss about different types of the same. (04)
- (C) List down the performance parameters of voltage regulator ICs. (01)
- Q. 6 Do as Directed
- (A) Discuss application of op-amp as comparator and zero crossing detector. (04)

OR

- (A) Explain averaging amplifier using op-amp. (04)
- (B) Define any four of following : (04)
- i) Output voltage swing.
 - ii) Slew rate.
 - iii) Common Mode Rejection Ratio (CMRR).
 - iv) Dropout voltage.
 - v) Quiescent current.
- (C) Only draw a pin diagram of IC 555. (02)

-----END OF PAPER-----