

Roll No. _____

[Total No. of Pages : 2

PG2S-035-B-22
M.Sc. II Semester Degree Examination
APPLIED ELECTRONICS
Fundamentals of Electronics
Paper : OET - 2.1

Time : 3 Hours

Maximum Marks : 80

PART-A

Attempt any EIGHT of the following.

(8×2=16)

1. a) Define electric current and write the formula to calculate electric current.
- b) State KCL and KVL.
- c) Write any two applications of LED.
- d) What is depletion region of diode?
- e) Define transconductance for JFET.
- f) Give any two ideal characteristics of an op-amp.
- g) Draw ideal and practical frequency response of high pass filter.
- h) Define op-amp comparator.
- i) Mention the need for power supply.
- j) Draw the pin diagram of IC555 timer.

PART-B

Answer any FOUR of the following.

(4×7=28)

2. State and Prove Maximum Power Transfer Theorem.
3. Distinguish between BJT and FET.
4. Explain the working of instrumentation amplifier.
5. With a neat circuit diagram, explain IC Regulated power supply.
6. Explain two port transistor model of BJT.
7. What is Schmitt trigger? Explain its working.

PART-C

Answer any THREE of the following.

(3×12=36)

8. State and explain Thevenin's theorem with an example.
9. Explain the construction, working of photodiode with an application.
10. Explain first order low pass filter using op-amp with relevant expressions.
11. Explain the working of monostable multivibrator using IC-555.

12. Write short notes on any **TWO**.

(2×6=12)

- i). Active elements
- ii). Solar cell
- iii). Precision Rectifier
- iv). D-A converters.

Roll No. _____

[Total No. of Pages : 2

PG2S-036-B-22
M.Sc. II Semester Degree Examination
APPLIED ELECTRONICS
Basic Electronics
Paper : OET - 2.2

Time : 3 Hours

Maximum Marks : 80

PART - A

Attempt any **Eight** of the following.

(8×2=16)

1. a) Define the following diode parameters.
 - i. Static resistance.
 - ii. Maximum forward currents.
- b) Distinguish between Zener and Avalanche breakdown.
- c) What is rectifier circuit? Mention different types of rectifiers.
- d) Draw the circuit diagram and VI characteristics of full wave rectifier.
- e) Mention the characteristics of p-channel JFET.
- f) State Barkhausen's Criteria.
- g) What is Oscillator? Mention types of oscillators.
- h) Define inverting and non-inverting OP-Amp
- i) Mention applications of UJT.
- j) What is voltage divider bias?
- k) Compare CE and CB configuration characteristics of a BJT.

PART - B

Answer any **Four** of the following.

(4×7=28)

2. Explain the operation of pn-junction diode under forward and reverse bias condition with help of VI characteristics curve.
3. Derive the expression for I_{dc} , V_{dc} , I_{rms} , V_{rms} , efficiency, ripple factor and PIV of half wave rectifier.
4. Explain the working and characteristics of n-channel JFET.
5. Draw and explain the operation of SCR using two-transistor equivalent circuit.
6. Design an inverting summing circuit with feedback $R_f = 100k\Omega$ using an op-amp to

generate the output $V_0 = -[3V_1 + 4V_2 + 5V_3]$.

7. Explain RC phase shift oscillator with circuit diagram and necessary equation.

PART - C

Answer any **Three** of the following.

(3×12=36)

8. a) With a neat diagram, explain the working of two diode full wave rectifier along with relevant waveform. (8+4)
- b) Show that the ripple factor of half wave rectifier is 1.21 and efficiency 40%.
9. a) Explain phase control application of SCR. (6+6)
- b) Distinguish between BJT and FET.
10. a) With a neat circuit diagram explain the operation of Colpitt's Oscillator. (6+6)
- b) In a transistor amplifier circuit, determine the voltage gain and the ac output voltage if $V_b = 100\text{mV}$, $R_c = 1\text{k}\Omega$ and $r_e' = 50\Omega$
11. a) Explain the working of UJT as a relaxation oscillator and draw the wave form across a capacitor. (6+6)
- b) A JFET has design circuit of 5mA. If $I_{DSS} = 10\text{mA}$ and $V_{GS}(\text{OFF}) = -6\text{V}$. Find the value of
- i) V_{GS}
- ii) V_p .
12. Write short notes on any **Two**. (2×6=12)
- a) Hartley Oscillator.
- b) Voltage regulator circuit.
- c) Voltage follower
- d) DC load line and bias power.