



Regulation R18

Subject code:2E2AG

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

## B.Tech II Semester Supplementary Examinations, January 2024

### ELECTRONIC DEVICES & CIRCUITS

(Common to EEE & IT)

Maximum Marks: 70

Date: 29.01.2024 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

#### Part-A

All the following questions carry equal marks (10x2M=20 Marks)		CO	Bloom Tx
1	Define diode resistance.	CO-1	L-1
2	Draw equivalent circuit of ideal diode.	CO-1	L-1
3	Define breakdown mechanisms in a diode.	CO-2	L-1
4	Draw the V-I characteristics of Varactor diode.	CO-2	L-1
5	Define Filter and mention types of Filters.	CO-3	L-1
6	Define the Rectifier.	CO-3	L-2
7	Define an Amplifier..	CO-4	L-1
8	Define stabilization factor of transistor.	CO-4	L-1
9	List the advantages of FET over BJT.	CO-5	L-1
10	Draw the symbols of P-Channel JFET and P- Channel enhancement MOSFET	CO-5	L-1

#### Part-B

Answer All the following questions. (5X10M=50Marks)				
11.a	Explain the operation of P-N Junction Diode with its V-I characteristics.	6M	CO-1	L-2
11.b.	Explain the junction capacitance of PN junction diode .	4M	CO-1	L-2
OR				
12.a.	Derive the Dynamic resistance of PN Junction diode.	6M	CO-1	L-4
12.b.	The voltage of silicon diode at room temperature at 300K is 0.71V when 2.5mA current flows through it .if the voltage increases to 0.8V calculate the new diode current.	4M	CO-1	L-3
13.	Explain the operation of a Tunnel Diode using Energy band diagrams.	10M	CO-2	L-2
OR				

14.	Explain the operation of Zener diode and draw its characteristics.	10M	CO-2	L-2
15.a.	Explain the operation of a Half wave Rectifier. Derive its ripple factor, Efficiency, PIV, and Form Factor.	6M	CO-3	L-2
15.b.	A sinusoidal voltage of amplitude 25 volts and frequency 50 hz is applied to a HWR using PN diode. No filter is used and the load resistor is 1000 ohms. The forward resistance $R_f$ of ideal diode is 10ohm. Calculate i) peak , average and rms values of load current ii) d.c power output iii)a.c power input, iv) rectifier efficiency v) ripple factor.	4M	CO-3	L-3
	OR			
16.a.	Explain C -section filter with neat circuit diagram.	6M	CO-3	L-2
16.b.	A 100microfarad capacitor when used as filter has 15v a.c across it with a terminating load resistor of 2.5kohm. If the filter is a full wave and supply frequency is 50Hz, what is the percentage ripple in the output?	4M	CO-3	L-3
17.	Explain the input and output characteristics of CC configured transistor circuit with a neat circuit diagram.	10M	CO-4	L-2
	OR			
18.a.	Explain operating point of a transistor and explain the concept of D.C Load line.	6M	CO-4	L-2
18.b.	Determine the operating point for a fixed bias circuit whose $V_{cc}=10V$ , $R_c=2K\Omega$ , $R_b=930K\Omega$ , $\beta=50$ for a silicon transistor.	4M	CO-4	L-3
19.	Explain the operation of JFET with the help of neat circuit diagram.	10M	CO-5	L-2
	OR			
20.	Explain the construction and operation of a Enhancement MOSFET and draw its characteristics.	10M	CO-5	L-2