Total No. of Questions – [4] Total No. of Printed Pages 02

G.R. No.	

Paper Code :- U127-104A (T1)

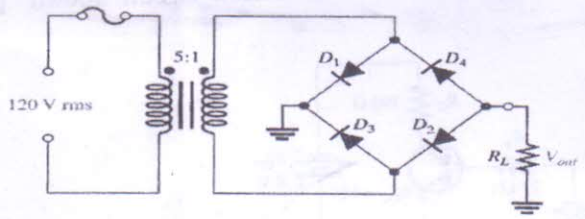
FEBRUARY 2018 / IN - SEM (T1)
F. Y. B.TECH. (COMMON) (SEMESTER - II)
COURSE NAME: Basic Electronics Engineering
(2017 PATTERN)

Time :[1 Hour] **[Max. Marks : 30]**

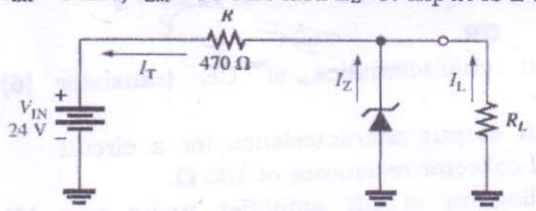
(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q1 a) Draw the output voltage waveform, calculate average output voltage and PIV of the rectifier shown in figure below. The Input voltage at primary of transformer is 120Vrms. **[6]**



b) Determine the minimum and maximum currents for which Zener diode shown in figure below that will maintain regulation. What is the minimum value of the R_L that can be used? Given V_Z=12V, I_{ZK} =1 mA, I_{ZM} =50 mA and Z_Z=0. Input is 24 V. **[6]**



c) Explain why Photo diode always operated in reverse bias mode? What is dark current? **[4]**

OR

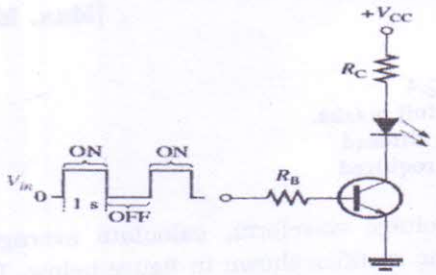
Q2 a) Draw the neat circuit diagram and explain in detail working of full wave Bridge rectifier. Derive the expression for DC output voltage. **[6]**

b) A certain full-wave rectifier has a peak output voltage of 30 V. A 50 μF capacitor filter is connected to the rectifier. Calculate the peak-to-peak ripple voltage, the dc output voltage and ripple factor developed across a load resistance of 600 Ω. Assume supply frequency to be 60 Hz. **[6]**

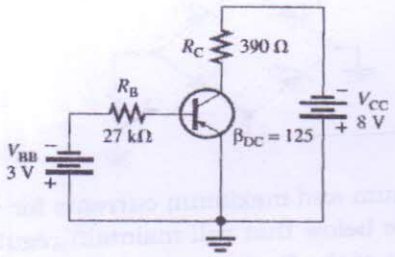
c) i) For a certain rectifier, V_{NL}=15.5 V, V_{FL}=14.9 V Calculate Percentage Load regulation. **[4]**

ii) In certain Zener regulator, output voltage changes by 0.2V when input voltage goes from 5 V to10 V. What is percentage line regulation?

Q3 **a)** For a transistorized flasher circuit shown below, calculate the magnitude of the square wave for proper operation of circuit. LED requires 30mA to emit sufficient light. V_{CC}= 9 V, $V_{CE(sat)}$= 0.3 V, R_C= 220 Ω , R_B = 3.3 KΩ, β_{DC}= 50, and V_{LED}=1.6 V. Use base current which is two times of minimum base current. **[6]**



b) Find all I_B, I_C ,V_{CE} and V_{CB} in the transistorised circuit shown below. **[4]**



c) Draw the circuit diagram and explain in detail working of transistor as a switch. **[4]**

OR

Q4 **a)** Draw Input and output characteristics of CE transistor configuration. **[6]**

Draw the DC load line on output characteristics for a circuit supplied with V_{CC}=10V and collector resistance of 100 Ω.

b) Draw the neat circuit diagram of CE amplifier using npn transistor. Derive the expression for voltage gain. **[4]**

c) Determine $I_{C(sat)}$ for the transistor shown in figure below. What is the value of I_B necessary to produce saturation? What minimum value of V_{IN} is necessary for saturation? Assume $V_{CE(sat)}$ = 0 V. **[4]**