Munish Sood

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MAKEUP EXAMINATION- 2016

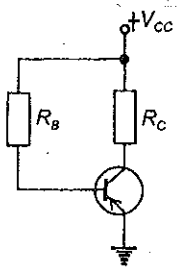
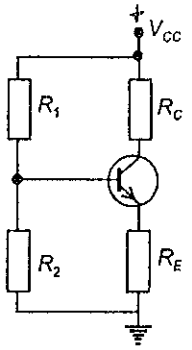
B.Tech, II Semester

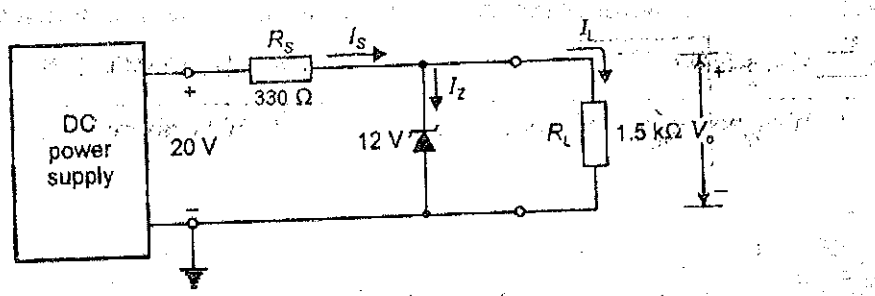
COURSE CODE: 10B11EC211 MAX. MARKS: 25

COURSE NAME: BEDC

COURSE CREDITS: 04 MAX. TIME: 1Hr 30 Min

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q.1.	Determine the intrinsic carrier concentration of germanium if its intrinsic resistivity at 300 K is 0.47Ωm. Given that the electron and hole mobilities are 0.39 m^2/Vs and 0.19 m^2/Vs, respectively.	**02**
Q.2.	A half-wave rectifier circuit uses a silicon diode with r_f = 10 Ω and V_T = 0.7 V. The load connected at the output is R_L = 500 Ω. The transformer has N_1/N_2 = 10/1. If the primary is connected to the ac mains supply (220 V, 50 Hz), calculate (*a*) the dc current through the load, (*b*) the rectification efficiency, and (*c*) the PIV rating of the diode.	**03**
Q.3.	A PNP transistor with β = 200 is used in the circuit of Fig 1. A dc supply of 9 V and R_C of 1.5 kΩ are used.The operating point is to be fixed at I_C = 2 mA. Calculate the value of R_B and the voltage V_{CE}.  **Fig.1**  **Fig.2**	**04**
Q.4	For the Fig2. Calculate the collector current and the collector-to-emitter voltage. Make necessary assumptions to simplify calculations.(Use approximate method) R_C = 5 kΩ R_1 = 40 kΩ V_{CC} = 12 V R_E = 1 kΩ R_2 = 5 kΩ β_0 = 60 , V_{BE} = 0.3 V	**05**

Q.5	During the day, the ac supply voltage changes. This causes the output of the unregulated dc power supply to vary from 17.5 V to 21 V. If the zener resistance is 11.5 Ω, what is the corresponding change in the output voltage of the regulator of Fig. 3 ?  **Fig.3**	05
Q.6	Define the following terms: (a) Avalanche break down (b) Zener break down (c) Threshold voltage for PN junction (d) D.C. load line	06