

THAPAR UNIVERSITY, PATIALA

B.TECH (DISTANCE EDUCATION) EXAMINATION, SEPTEMBER, 2007

ELECTRONIC DEVICES & CIRCUITS (EE001D)

TIME ALLOWED: 3 HOURS

MAXIMUM MARKS: 100

NOTE: ALL QUESTIONS ARE COMPULSORY.

- Q1. (A) Explain the process of Avalanche breakdown. (2 × 10)
- (B) How diode is used as a clipper? Explain with the help of neat sketch.
- (C) Draw output characteristics of a CB transistor.
- (D) How transistor can work as a switch? Explain.
- (E) Why the input impedance of a JFET is so high?
- (F) Compare BJT, JFET and MOSFET devices in all respect.
- (G) Why is class 'A' operation less efficient than class 'C' operation?
- (H) What are the applications of class 'D' amplifier?
- (I) Write down the ideal OP-AMP characteristics.
- (J) What is the advantage of using high-gain transistor in the phase shift oscillator?
- Q2. (A) Derive the efficiency expression of a full wave rectifier circuit. (8 × 2)
- (B) A zener diode of fig (1) has $V_Z = 12\text{ V}$. determine the minimum and maximum zener current as well as the output voltage, when zener diode is considered to be ideal one.
- Q3. (A) The transistor in the circuit of fig (2) has $\beta = 50$ and exhibits a V_{BE} of 0.7 V. find terminal voltages V_C , V_B and V_E , if transistor works in saturation mode.
- (B) Draw and explain input-output characteristics of CE transistor. (8 × 2)
- Q4. (A) For the JFET amplifier circuit shown in fig (3) if $g_m = 2500\mu$, and $V_{in} = 5\text{ mV}$, what is the value of V_o .
- (B) Explain the working of P-channel JFET. (8 × 2)
- Q5. (A) Draw a darlington emitter follower. Explain why input impedance is higher than that of a single-stage emitter follower.
- (B) Draw the circuit of two stages RC coupled common emitter amplifier and describe the function of each element. (8 × 2)
- Q6. (A) In fig (4) if $E_1 = 10\text{ V}$, $E_2 = 5\text{ V}$, then $E_{out} = ?$
- (B) Explain the working of crystal oscillator circuit. (8 × 2)
- P.T.O.

