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Question Paper Code : 11387

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Third Semester

Electronics and Instrumentation Engineering

EI 2203/132302/EI 35/EC 1209/10133 EE 305/080300002 – ELECTRONIC
DEVICES AND CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulation 2008)

(Common to PTEI 2203 – Electronic Devices and Circuits for B.E. (Part-Time)
Second Semester – Electronics and Instrumentation Engineering –
Regulation 2009)

Time : Three hours

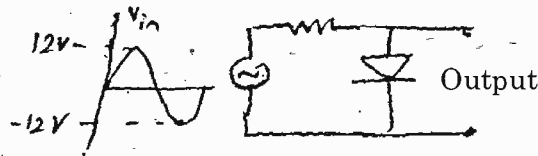
Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the current components in a p-n diode.
2. Determine the Q-point of a base biased transistor circuit with $R_B = 100k\Omega$, $R_C = 560\Omega$, $V_{CC} = 12V$ and $\beta_{DC} = 100$.
3. What is forward transconductance in JFET? How is it expressed in terms of $V_{GS(off)}$?
4. What is meant by forward-breakover voltage $V_{BR(F)}$ in SCR?
5. Why is common collector amplifier called as emitter follower?
6. What is the condition for centering Q-point on the AC load-line in class A power amplifier?
7. Draw the block diagram of Ideal single-loop feedback amplifier and write its operation.

8. State Barkhausen criterion for oscillation.
9. Draw the output of the following circuit. Consider the drop across diode = 0.12V.



10. What is the drawback of Zener voltage regulator?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the operation of Tunnel diode and its V-I characteristics. (8)
- (ii) Explain the various switching times of PN diode with diagrams. (8)

Or

- (b) Derive the expression for stability factor of voltage divider bias circuit. (16)

12. (a) (i) Explain the working principle of D-MOSFET. (8)
- (ii) Determine I_D and V_{GS} for the JFET with voltage divider bias in Fig. Q. 12. (a) (ii), given that for this JFET the internal parameter values are such that $V_D = 7V$. (8)

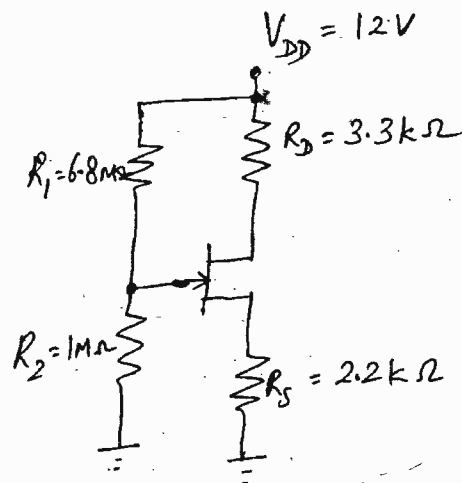


Fig. Q. 12 (a) (ii)

Or

- (b) (i) Explain the operation of UJT and draw its characteristics. (8)
- (ii) Explain with a neat sketch about the working of SCR and draw its characteristics. (8)

13. (a) Find the input impedance, output impedance and voltage gain of transistor common collector amplifier circuit. (16)

Or

- (b) Explain the working of transformer coupled class-A power amplifier with diagrams and derive the expression for efficiency. (16)
14. (a) Derive the expression for voltage gain, input impedance and output impedance with negative feedback in a current-shunt feedback amplifier. (16)

Or

- (b) With neat circuit, explain the working principle of colpitts oscillator and derive the expression for frequency of oscillation. (16)
15. (a) (i) Explain the working principle of biased series and parallel clippers. (8)
- (ii) Explain the working of Schmitt trigger. (8)

Or

- (b) Explain the working of transistor series voltage regulator with error amplifier. Also explain how the performance of this voltage regulator can be improved. (16)