

BOARD OF TECHNICAL EDUCATION

PORVORIM-GOA

November, 2008 Examinations

Programme: ELECTRONICS ENGG. | EC | MED | IS | COM | E

Course/Subject: BASIC ELECTRONICS (4132R)

Time Duration: 3 Hrs.

Max. Marks: 100

INSTRUCTIONS: 1. All Questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable additional data if required.

- Q.No. 1. Answer ANY FIVE of the following:- (4x5=20)
- Explain the terms: i) Conduction band ii) Valence band.
Name two conductors, two insulators, two semiconductors.
 - Explain the terms: i) Donor ii) Acceptor iii) Majority, Minority carriers
 - Explain the terms: i) Depletion region
ii) Space charge region
iii) Barrier Potential
iv) Knee voltage.
 - Sketch PNP transistor construction, marking all important regions, junctions. Draw its symbol.
 - What is Q-point? Why is there a need to bias a transistor?
- Q.No. 2. Answer ANY TWO of the following:- (2x8=16)
- Explain intrinsic semiconductor and describe its conductor behaviour at absolute zero and room temperature.
 - Explain behaviour of 'n' type semiconductor in detail, with suitable diagrams.
 - Explain behaviour of pn junction, with no external voltages applied, with appropriate figures.
- Q.No. 3. Answer ANY TWO of the following:- (2x8=16)
- An ideal diode behaves like a switch. Explain this statement with suitable characteristics.
 - With help of neat circuit diagram, explain the operation of full wave bridge rectifier. Draw relevant waveforms. State its advantages over half wave rectifier, with reference to performance parameters.
 - Describe the construction and explain the operation of a zener diode, including breakdown mechanisms.
- Q.No. 4. Answer ANY TWO of the following:- (2x8=16)
- Explain the operation and compare the performance of commonly used filter circuits.

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- Q.No. 4.
- b) A 10:1 transformer, connected to ac mains, has its output connected to a bridge rectifier.
Obtain: i) Output dc voltage across load.
ii) PIV of diode.
 - c) Explain operation of a transistor, with appropriate figures.
- Q.No. 5. Answer ANY TWO of the following:- (2x8=16)
- a) Draw a neat diagram to obtain pnp transistor characteristics in CE configuration. Describe the characteristics obtained.
 - b) Compare the different transistor configurations, with respect to important specifications. Which is most preferred and why?
 - c) You are required to obtain npn transistors characteristics in CB configuration. Draw the circuit required and explain the characteristics obtained.
- Q.No. 6. Answer the following:- (any two) 2x8=16
- a) Explain any commonly used method for biasing a transistor. State its merits and drawbacks.
 - b) Calculate collector current I_C and V_{CE} in emitter bias circuit, Where $V_{CC} = 10V$, $V_{EE} = 13V$, $R_C = 5 k\Omega$, $R_E = 10k\Omega$, $R_B = 10k\Omega$, $\beta = 100$.
 - c) Write note on i) Heat sink ii) thermal runaway.

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PORVORIM-GOA

May/June, 2009 Examinations

Programme: ELECTRONICS ENGG/EC/MED/IS/COMP/E

Course/Subject: BASIC ELECTRONICS (4132R)

Time Duration: 3 Hrs.

Max. Marks: 75

INSTRUCTIONS: 1.All Questions are compulsory.
2.Figures to the right indicate full marks.
3.Assume suitable additional data if required.

- 1) Answer the following :- 5x3=15
- a) Draw Suitable energy level band diagram for a typical Conductor, insulator and Semiconductor. State one example of each.
 - b) What is meant by: i) donor (ii) Acceptor (iii) Majority Carrier (iv) Minority Carrier.
 - c) What is meant by: i) Space charge region (ii) Depletion region (iii) Barrier Potential (iv) Knee Voltage.
 - d) Sketch NPN transistor construction , marking all important regions & Junctions, Draw its symbol.
 - e) Explain the terms (i) cutoff (ii) Saturation (iii) alpha. (iv) Beta
- Q.No.2. Answer the following# (Any two) 2x6=12
- a) Explain the term 'Intrinsic Semiconductor '
Describe its Conduction behaviour at (i) absolute Zero
ii) Room temperature
 - b) Explain behaviour of 'P' type Semiconductor in detail with suitable diagrams.
 - c) Explain the behaviour of Pn Junction, with no external voltage applied with appropriate Figures.
- Q.No.3. Answer the following. (Any two) 2x6=12
- a) Draw circuit diagram to determine diode characteristics. Explain the nature of the Characteristics obtained.
 - b) With help of neat circuit diagram explain the operation of rectifier employing two diodes, with relevant wave forms. Compare its Performance with rectifier employing four diodes
 - c) How does Zener diode behave as a voltage regulator? Explain with reference to Zener diode characteristics.

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Q.No.4. Answer any two.

2x6=12

- a) What is the need for a Filter ? Explain the operation of any two commonly used Filter Circuits.
- b) A 8: 1 transformer, connected to a c mains, has its output connected to bridge rectifier
obtain: i) output dc voltage across load (ii) p_iv of diode.
- c) What is meant by transistor action? Explain.

Q.No.5. Answer any two.

2x6=12

- a) Draw a neat diagram to obtain npn transistor characteristics in C E Configuration. Describe the characteristics obtained.
- b) What are the different Commonly employed transistor Configuration? Which one is preferred and why?
- c) You are required to obtain pnp transistor characteristics in C B Configuration. Draw the Circuit required and explain the Characteristics obtained.

Q.No.6. Answer any 2.

2x6=12

- a) Explain the commonly employed biasing method for transistor, with Circuit diagram.
- b) Write note on thermal runaway and heat Sink.
- c) Calculate the collector current and V_{CE} in emitter bias circuit where $V_{CC} = 12 V$, $V_{EE} = 15 v$,
 $R_C = 5 K\Omega$, $R_E = 10 k\Omega$, $R_B = 10 k\Omega$, $\beta = 100$.

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