**END SEMESTER / RETEST EXAMINATION**

**Semester: 3rd( NEW)**

**Subject code: Et-305**

**Subject: Analog Electronics-I**

**Full Marks: 70 (part A- 25 + Part B-45)**

**Duration: 3 hours**

**Part A**

| Question no. | Questions | marks |
|---|---|---|
| Question 1 | **Fill in the blanks** | 1x10=10 |
| a | _____ are the majority charge carriers in p-type materials. | |
| b | Zener diodes are _____ doped. | |
| c | LDR stands for _____. | |
| d | Maximum efficiency of full wave rectifier is _____. | |
| e | _____ removes the d.c. component of rectifier output and allows the a.c. component to reach the load. | |
| f | BJT has _____ pn junctions. | |
| g | _____ bias is most widely used biasing technique to provide stabilisation. | |
| h | JFET is a _____ controlled device. | |
| i | RC coupled amplifiers are widely used as _____ amplifiers. | |
| j | Collector current flows at all times during the full cycle of the signal in _____ power amplifiers. | |
| Question 2 | **Write true or false** | 1x10=10 |
| a | Semiconductors have negative temperature co-efficient of resistance. | |
| b | A positive clipper removes the positive half cycle of the input signal. | |
| c | The ripple factor of half wave rectifier is 0.48. | |
| d | Full wave bridge rectifier uses two diodes for its operation. | |
| e | BJT has four terminals. | |
| f | Common emitter amplifier does not have current gain. | |
| g | MOSFET is a unipolar device. | |
| h | UJT has only one junction. | |
| i | Direct coupled amplifiers are used for amplifying extremely low frequencies. | |
| j | Complementary symmetry class B push pull amplifiers use two npn transistors. | |
| Question 3 | **Choose the correct answer** | 1x5=5 |
| a | The number of valence electrons in trivalent impurity is<br>i) 3 ii) 4<br>iii) 5 iv) 6 | |
| b | With reverse bias to a pn junction diode, the width of depletion layer | |

| | | |
|---|---|---|
| | i) Increases ii) Decreases<br>iii) Remains same iv) None of the above | |
| c | The relation between α and β in BJT is<br>i) $\alpha=1+\beta$ ii) Both (i) & (iii) are correct<br>iii) $\beta=1+\alpha$ iv) None of the above. | |
| d | A BJT acts as an amplifier when it operates in<br>i) Saturation region iii) Cutoff region<br>iii) Active region iv) None of the above | |
| e | A push-pull amplifier contains<br>i) One transistor ii) Two transistors<br>iii) Three transistors iv) Four transistors | |

**PART -B**

| Question no. | Questions | marks |
|---|---|---|
| Question 4 | **Answer all the questions** | 2x5=10 |
| a | Define intrinsic and extrinsic semiconductors. | |
| b | Draw the symbols of varactor and schottky diodes. | |
| c | Define Q-point in a transistor. | |
| d | What is pinch off voltage? | |
| e | What is crossover distortion? | |
| Question 5 | **Answer any five questions** | 3x5=15 |
| a | Write the differences between zener breakdown and avalanche breakdown. | |
| b | Derive an expression to find the maximum rectifier efficiency of half wave rectifier. | |
| c | If $\beta=49$ and $I_E=1.5$ mA in a transistor, the find the values of α, $I_B$ and $I_C$. | |
| d | Explain briefly the working of a CB transistor amplifier. | |
| e | Draw the basic structure of a UJT. Write one application of it. | |
| f | Discuss the frequency response of RC coupled transistor amplifier. | |
| g | Compare voltage amplifier with power amplifier. | |
| Question 6 | **Answer any four questions** | 5x4=20 |
| a | Explain the operation of clamper circuits with appropriate diagrams. | |
| b | Draw a neat circuit diagram of centre tap full wave rectifier. Also explain its operation. | |
| c | Explain the formation of NPN transistor. | |
| d | Draw the circuit diagrams for n-channel and p-channel JFETs. Write the working principle of an n-channel JFET. | |
| e | With a neat circuit diagram, explain the working a transformer coupled transistor amplifier. | |
| f | **Write short notes on-** (i) Solar Cell, (ii) Complementary-symmetry amplifier. | |

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