Pokhara University

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| Level: Bachelor | Semester – Fall | Year : 2012 |
| Programme: BE | | Full Marks: 100 |
| Course: Electronic Devices | | Pass Marks: 45 |
| Time : 3hrs. |

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| *Candidates are required to give their answers in their own words as far as practicable.* |
| *The figures in the margin indicate full marks.* |
| Attempt all the questions. |

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|  | 1. Discuss on the characteristics of the non-linear elements. Draw a piecewise linear equivalent circuit of a diode. 2. Determine the range of RL and IL that will result in VRL being maintained at 10 V and also determine the minimum and maximum power dissipation in the zener diode in the circuit shown below:   50 V  RS = 1 KΩ  VZ = 10 V  IZM = 32 mA  IL  IZ  RL | 7  8 |
|  | 1. Differentiate between intrinsic and extrinsic semiconductor. Explain PN junction diode with the help of band structure. 2. Explain the V-I characteristics of tunnel diode with the help of necessary diagram. Also mention its applications. Why Ge or GaAs is more preferable than Si to manufacture the tunnel diode? | 7  8 |
|  | 1. Design a self bias circuit for a Si transistor having VBE= 0.6 V, β= 99. Desired operating point (5 V, 1 mA). Assume VCC= 10 V, RC= 3 KΩ and S=5.   **OR**   1. For the circuit shown below find IB, IC, IE, VB, VC, VE and β=100. Is the transistor operating in the active mode?      1. Explain the construction and principle of operation of Bipolar Junction Transistor. Also explain "Reach-through" effect in BJT. | 7  8 |
|  | 1. For the following transistor amplifier configuration shown below draw small signal re equivalent model. Calculate input impedance, output impedance, voltage gain and current gain using small signal re model neglecting the effect of ro. Given β =100, Vcc=15 V.     Vout  Vin   1. Determine the DC operating point for the configuration shown below. Also draw the load line and find out the stability factor. Assume β = 140   10 μF  39KΩ  100 KΩ  1.5 KΩ  10 μF  50 μF  o  o  o  22 V  3.9 KΩ  Vi  Vo | 8  7 |
|  | 1. Determine the expression for Ai, Zi, Av & Yo for the two port transistor network shown below in terms of h parameters.   Two port active network  ( transistor)  o  o  o  o  VS  RS  V1  V2  ZL  IL  I2  I1   1. Explain the operation of N-Channel JFET. What is pinch off voltage? Draw the transfer characterstic curves for N-channel JFET   Two port active network  ( transistor)  o  o  o  o  VS  RS  V1  V2  ZL  IL  I2  I1  Two port active network  ( transistor)  o  o  o  o  VS  RS  V1  V2  ZL  IL  I2  I1  Two port active network  ( transistor)  o  o  o  o  VS  RS  V1  V2  ZL  IL  I2  I1 | 7  8 |
|  | 1. Derive full wave bridge rectifier circuit and explain its operation. Compare half wave and full wave rectification in terms of ripple factor, efficiency and root mean square value. 2. For the circuit given below find out the output voltage waveform and explain how waveform is drawn?   C:\Documents and Settings\Administrator\Desktop\Scan\2012_06_08\IMG1.jpg | 8  7 |
|  | Write short notes on **any two:**   1. High frequency T-model for CE configuration 2. Uni-junction transistor (UJT) 3. Depletion type MOSFET | 2×5 |