KHAIRA COLLEGE, KHAIRA, BALASORE

QUESTION BANK

UG 3RD Sem - CC – VII

Answer all questions

1- Answer the following :   **[1mark]**

   a) The conductor _____ band is absent.

   b) The band gap for Ge is _____ ev.

   c) For a transistor $\gamma = 1 +$ _____ .

   d) In a transistor the emitter junction is _____ biased.

   e) In Class – B amplifier the collector current flows for _____ cycle of input signal.

   f) Power amplifiers _____ the power level of the signal.

   g) For an ideal OP-AMP output importance is _____ .

   h) Voltage follower is also known as _____ gain buffer.

   i) P-type semiconductor as a whole is _____ (+ve or neutral).

   j) Mobility of electron is ratio of its drift velocity to the _____ .

   k) Ripple factor of full wave rectifier is _____ .

   l) An ideal OP-AMP has _____ output impedence.

   m) Zener diode operate is _____ biasing.

   n) Value of α of transistor is ($\alpha > 1, \alpha < 1, \alpha = 1$)

   o) An adder is known as _____ amplifier.

   p) Hartley oscillator generates _____ frequency

2- Answer the following (Very short type) :-   **[1.5 marks]**

   a) How N-type semiconductor is produced.

   b) The value of α of a transistor is 0.98, find its β.

   c) Draw circuit diagram of P-N-P transistor in CE – mode.

   d) Define fullwave rectifier.

   e) Write two advantage of collector to basebias method.

f) Find the value of base current in CB transistor connection of Ie = 3mA and Ic = 1mA.
g) Define class –B and C amplifiers.
h) A class B push full amplifier uses supply voltage of 20V and load 20Ω. Find the end point values of AC load line.
i) Write Barkhausen's condition for sustained oscillation.
j) Write two application of LED.
k) Draw forward bias circuit of a prejunction diode.
l) Define ripple factor. What is it's value for a half wave rectifier.
m) Draw the circuit diagram for forward biased LED.
n) Write three uses of solar cells.
o) Write down the most commonly used methods for transistor biasing.
p) Determine the value base current in a common based transistor if ammeter current is 4 mA and collector current is 1 mA.
q) Define closed loop voltage gain.
r) Write down the condition for an ideal operational amplifier.
s) Define band width of RC-coupoled amplifier. Write it's expression.
t) Distinguish between Class – A, Class – B and Class – C amplifier.

3- Answer the following (Sort type) :-   **[2 marks]**
   a) Define valence band and conduction band.
   b) Write down the demerits of a center tap full wave rectifier.
   c) Describe the construction of a photo diode.
   d) Find the value of α and γ if β = 29.
   e) Discuss different type of feedback circuit.
   f) Write down the primary requirements of an oscillator.

g) Determine the maximum operating frequency for an OP- AMP having slew rate 0.1 V/ pcs, pick output voltage is 10V.

h) Write four properties of OP-AMP.

i) Discuss the effect of negative feedback on the stability of gain.

j) Draw frequency response curve for the coupled amplifier.

k) Distinguish intrinsic and extrinsic semiconductor.

l) Write three application of solar cell.

m) Prove that $\alpha = \frac{\beta}{1+\beta}$, where α, β are current gain in CB, CE mode of transistor.

n) Explain CMRR.

o) Write two disadvantages of half wave rectifier.

p) State the meaning of dc and ac load line for a transistor.

q) Find the stability factor and base current in divider circuit using a silicon transistor with β = 50, Given R_1 =10 kΩ, R_2=5 kΩ, R_E =2 kΩ, V_∞ =20V.

r) Discuss operation of OP-AMP as integrator.

s) What are advantage of +ve feedback in amplifier?

t) What do you mean by slew rate?

4- Answer the followings (Long type) :-   **[6marks]**

a) Describe a centre-tapped full wave rectifier. Find the expression for efficiency and ripple factor.

b) What is photodiode? Write its principle of working, construction, function and application.

c) Explain working of N-P-N transistor. Draw its characteristics.

d) Write short notes on the following :
   i) Load line and Q-point analysis of transistor.
   ii) Classification of A, B and C amplifier.

e) Discuss construction and working of RC coupled transistor amplifier. Explain its frequency response and band width.

f) Describe Colpitts Oscillation.

g) Discuss the frequency response of an OP-AMP.

h) Design and discuss the operation of an OP-AMP is
   i) Differentiator
   ii) Adder.

i) Derive expression for drift velocity. Establish a relation between conductivity and mobility.

j) What is a zener diode? Describe it's contraction and explain its function as a voltage regulation.

k) Describe the construction, working and characteristics of a PNP transistor in CE configuration with neat circuit diagram.

l) What are hybrid parameters? Draw h-parameter equivalent circuit and find the expression for current gain, voltage gain and power gain in CE mode.

m) Describe the construction, working and frequency response of a RC coupled amplifier with act diagram.

n) Describe construction and working of a Hertley oscillator. Find the expression for frequency.

o) Define OP-AMP. Draw block diagram. Describe IC-741 OPAMP and mention its characteristics.

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