Student Exam No: _____

GANPAT UNIVERSITY
B.TECH SEM. III BIOMEDICAL & INSTRUMENTATION ENGINEERING
CBCS REGULAR EXAMINATION NOV/DEC - 2014
2BM301 LINEAR ELECTRONICS

Time: 3 hour **Marks: 70**

INSTRUCTION:

1. Write each section in separate answer books.
2. All questions are compulsory.
3. Draw figures & circuits, write equations and assume data wherever necessary.
4. Conventional terms / notations are used.
5. Figure to the right indicate marks.

Section – I

Q.1 **[12]**

a) Define:

1. Biasing
2. Intrinsic semiconductor
3. Barrier Potential
4. P-type material
5. Zener breakdown
6. Electronics

b) With the help of neat diagram explain the input output characteristic of Transistor in CB configuration. Show different operating regions of transistor on graph.

OR

Q.1 **[12]**

a) Design voltage divider CE amplifier circuit if RL = 120kΩ, rs = 600Ω, Vcc = 24V and lower cut-off frequency is 100 Hz. hfe = 100 and hie = 1 kΩ, V_E = 5V and V_{CE} = 3V.

b) Explain how shifting of Q-point in different regions can lead to waveform distortion. Explain the effects of various amplifier circuit parameters on the Q-point through load line analysis.

Q.2 **[11]**

a) What is Positive and Negative feedback? Write their difference and derive their gain equations.

b) An amplifier without feedback gives output of 12.5 for input 0.25. Amplifier for same output with negative feedback requires input of 1.5. Find the respective voltage gains and the feedback ratio.

OR

Q.2 **[11]**

a) Draw load line for fixed bias configuration of transistor based CE amplifier. If R_B = 470 KΩ, R_C = 2.2 KΩ, V_{CC} = +18V, V_{BE} = 0.7. Determine I_C and V_{CE} for β = 50, 100 and 200. Comment on the circuit stability.

b) Explain the basic construction of transistor with symbols, construction and circuit diagrams. What is the importance of input-output coupling and Bypass capacitors in amplifier circuits?

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Q.3 **Write shot note on (Any three)** [12]

a) Darlington Pair and its applications
b) Classification of oscillator
c) Derive input-output impedance and voltage gain equations of re Transistor model Common emitter Voltage divider Bias configuration
d) Do h-parameter circuit analysis for CE amplifier with un-bypassed R_E resistor.

Section – II

Q.4 [12]

a). Describe basic working operation of n-channel JFET device with its drain characteristics.
b) Enlist different biasing configuration of JFET and determine the Q-point and Load line analysis of any one in detail.

OR

Q.4 [12]

a). Explain series fed type class A amplifier with calculations of maximum overall and collector efficiency. Draw AC load line showing Q-point.
b). Describe the working of Colpitt Oscillator. If $C_1 = 1\mu F$, $C_2 = 5\mu F$ & $L = 10mH$ then calculate the oscillator output frequency.

Q.5 [11]

a). Explain the operation of complementary symmetry Push Pull Class B power amplifier with overall efficiency calculations. What is cross over distortion?
b). Distinguish between: Push pull amplifier and complementary Push pull amplifier

OR

Q.5 [11]

a). Draw symbol, construction diagram and explain characteristic curve of SCR showing different operating regions.
b). Distinguish between : Voltage and Power Amplifier

Q.6 **Write shot note on (Any three)** [12]

a). Characteristic curve of UJT and its application
b). Turning SCR device ON and OFF
c). Depletion MOSFET
d) TRIAC

----------END OF PAPER----------