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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

SUMMER SEMESTER (JULY 2016)- B-Tech

END TERM EXAM

COURSE CODE: **10B11EC312** MAX. MARKS: **50**

COURSE NAME: **Analogue Electronics** MAX.TIME: **2 HRS**

COURSE CREDITS: **4**

Q1. a) Elaborate the RC coupled amplifiers and draw its frequency response curve. **(6)**

b) Three identical cascaded stages have an overall upper 3-dB frequency of 100 kHz and a lower 3-dB frequency of 25 kHz. Determine f_L and f_H for each stage, assuming non interactive stages. **(4)**

Q2. a) Draw and explain the working of R-C phase shift oscillator and also derive an expression for its frequency of oscillations. **(6)**

b) Explain the push pull amplifiers and their advantages **(4)**

Q3. a) What are feedback amplifiers. Derive the gain of a negative feedback amplifier. **(6)**

b) To an amplifier with a gain of 60 dB, a negative feedback of $\beta = 0.006$ is applied. What will be the percentage change in the overall gain of the feedback amplifier if the internal gain of the amplifier reduces by 3 %. **(4)**

Q4. a) What are oscillators and derive the condition of Barkhusan for oscillations in electronic systems? **(6)**

b) Figure 1 shows the tuned circuit used in a Hartley oscillator, with $L_1 = 1$ μH, $L_2 = 0.2$ μH, and $C = 1000$ pF. (*i*) What is its frequency of oscillation ? (*ii*) What is the feedback factor β ? (*iii*) For the oscillator to start, what is the minimum value of gain A ? **(4)**

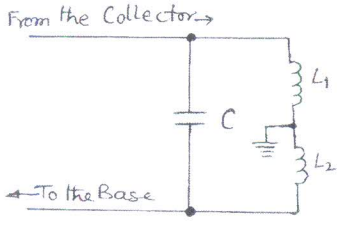

Fig 1

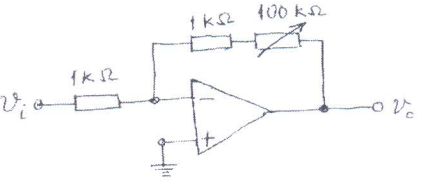

Fig 2

Q5. a) What is an ideal op-amp and discuss various applications of op-amp. **(6)**

b) The adjustable resistor of Fig.2 can be varied from 0 to 100 kΩ. Calculate the minimum and maximum closed-loop voltage gain. **(4)**