National Institute of Technology, Hamirpur(HP)

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End Semester Examination - May 2023

Course - B.Tech. Engineering Physics

Semester - VIth

Subject Code - PH-322, Subject Name -Analog and Digital Electronics Maximum Marks: 50

Time: 3:00 Hours

All questions are compulsory. Write the answers point-wise.

Ques 1:

a) Fill the blank space $(1-\alpha)(1+\beta) = \dots$

0)) what will be the stability factor (S) in fixed biased aircritic 0, 1000	(1)
c)) Negative feedback is essential for a similar division of the feedba	(1)
d) Calculate the drain consential for a circuit to oscillate. (True / False).	(1)
4)	V_{GS} = 4 Volts, and V_T = 2V.	$^{3} A/V^{2}$,
e)	Write decimal equivalent number corresponding to a line	(1)
f)	How many flip flows a binary number 1010.	(1)
-)	flow many mp-mops are required for mod-32 counter	(1)
g)	In a 4-bit resistive divider network circuit what is the	(1)
	0101?	umber
h)	Give two example of primary memory/storage	(1)
i)	Cache memory is the average in a for y storage.	(1)
:>	the intention of the example of (a) Primary memory [] or (b) Secondary memory []	(1)
J)	Hard disk drives (HDDs), SSDs, ontical disks, and USP	(1)
	of the set	(1)
0	2 U	(-)

Ques 2: How many classifications of amplifiers are possible on the basis of mode of operations? Graphically show the common emitter Class-A, and Class-B amplifier with one possible application for [5]

Ques 3: Draw gain v/s frequency plot for an Op-Amp. Define cutoff frequency of op-amp. Give the equation for unit gain frequency. Determine the cutoff frequency of an op-amp having specified values $B_1=1$ MHz, and $A_{VD}=200$ V/mV. [5]

Ques 4: Draw the construction diagram of n-channel depletion type MOSFET with its working. Plot the output characteristics and transfer characteristic of this MOSFET for different values of positive and [5]

Ques 5: Describe, with a circuit diagram, the working of Hartley oscillator, giving expression for its [5]

Ques 6: What is the advantage of J-K flip flop? Make a logic circuit diagram of positive edge trigger J-K flip flop with its symbol and truth table. [5]

Ques 7: Draw a 4-bit binary ladder circuit for digital-to-analog converter. Deduce the formula for analog output voltage for n-bit binary number. What will be the analog voltage corresponding to 4-bit binary

Ques 8: What is the use of registers in digital electronics/circuits? Construct a 4-bit serial input-serial output shift register using D Flip flop (negative edge triggered), and draw a waveform diagram (suppose that initially the stored number is 0101). [5]

Ques 9: Make a block diagram of 3-bit binary Asynchronous ripple counter with truth table and waveform diagram. What is the main disadvantage of ripple counter? [5]

..... Good Luck.....