

Printed pages:	EEEC101.
(Following paper code and roll No. to be filled in your answer book)	
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ODD B. Tech. 2012-13
Semester Examination,

Time: 3hrs.

Max. Marks: 100

Subject: Electronics Engineering

- Note: (1) Attempt ALL questions.
(2) ASSUME ALL MISSING DATA.

SECTION A

1. Attempt all questions. [10*2=20]
- (a) What is depletion layer in the context of semiconductor diode.
 - (b) Draw the V-I characteristic of a zener diode and explain how a zener diode regulates the voltage.
 - (c) How the two transistor junctions must be biased for proper operation of a transistor amplifier.
 - (d) Sketch in input and output characteristics (V-I) of a CE NPN transistor configuration with proper labels.
 - (e) What is major difference between a bipolar and unipolar device.
 - (f) What is the main difference between the construction of an enhancement type MOSFET and depletion type MOSFET?
 - (g) Write the properties of an ideal Op-Amp.
 - (h) What is BCD? Where it is used?

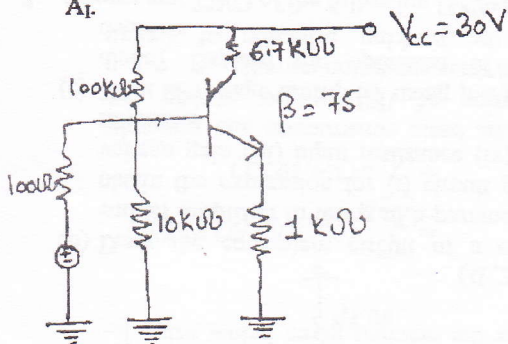
- (i) What maximum voltage can be measured by a 3 and 1/2 digit voltmeter having a resolution of 100mV?
- (j) Explain Karnough map (K-Map) and its use.

SECTION B

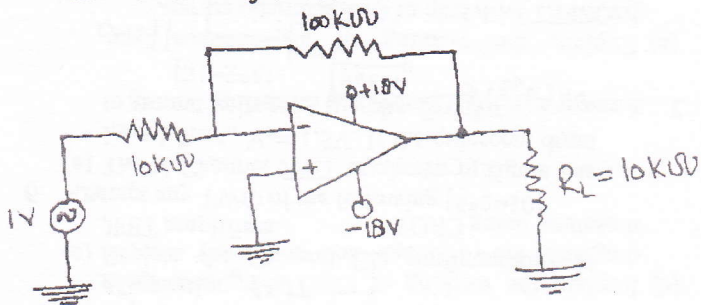
2. Attempt any three of the following. All question carry equal marks. [10*3=30]

(a) What is ripple factor? Derive the expression of ripple factor. What is the value of ripple factor for half wave and full wave rectifier?

(b) For single stage CE amplifier shown in figure. Calculate the following (i) A_v (ii) R_i (iii) R_o (iv) A_i .



(c) Draw and derive the expression for an integrator with an OP-Amp. For the circuit shown in figure, find the closed-loop gain, input impedance and common-mode rejection ration.



- (d) Explain the working of CRO using neat block diagram. How voltage and frequency can be measured using CRO?

SECTION C

3. Answer any TWO part of the following:

[5*2=10]

- (a) Explain the working of an enhance type MOSFET with help of Characteristic curves.
 (b) Explain the application of zener diode as shunt regulator.
 (c) Describe the biasing of transistors.

4. Answer any TWO part of the following [5*2=10]

- (a) Minimize the function given below using K-Map.

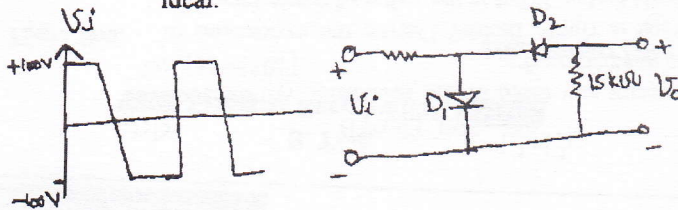
$$f(A, B, C, D)$$

$$= \sum_m (0, 2, 3, 6, 7, 9, 12, 15) + \sum_d (1, 4, 10, 11)$$

- (b) Explain the basic construction and principle of operation of JFET. Also explain the maximum drain saturation current.
 (c) Explain the working principle of digital voltmeter.

5. Answer any TWO part of the following [5*2=10]

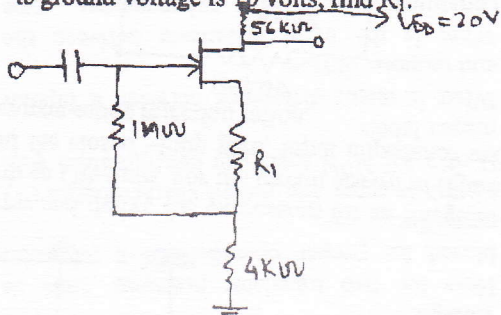
- (a) Sketch the output voltage V_0 for the circuit shown in figure, assume diodes D_1 and D_2 are ideal.



- (b) Explain the basic construction and principle of operation of BJT.
 (c) Explain the CS and CD configurations of JFET amplifiers.

6. Attempt any TWO of the following [5*2=10]

- (a) The N-Channel JFET as shown in figure has $I_{DSS}=1.5\text{mA}$, $V_P=-1.5\text{V}$. If the quiescent drain to ground voltage is 10 volts, find R_1 .



- (b) Draw the equivalent circuit of a common emitter amplifier in terms of h-parameter also obtain the expression for (i) circuit gain (ii) voltage gain (iii) input resistance (iv) output resistance.
 (c) What is voltage multiplier using p-n junction diode? Explain the operation of voltage doublers.
7. Answer any TWO of the following [5*2=10]
 (a) Construct logic circuits using INVERTER, AND and OR gates for the Boolean expression
 (i) $X = \overline{C + AB}$
 (ii) $Y = AB + \overline{BC}$
 (b) Perform the subtraction of the following unsigned binary numbers using the 2's compliments of the subtrahend
 (i) $(1101)_2 - (101100)_2$
 (ii) $(11.01)_2 - (0001.1110)_2$

(c) Explain the half wave and full wave rectifier circuit using P-N junction diode.