



DRR-3219

Third Year B. Sc. (Sem. VI) (Physics) Examination

March / April - 2016

Electronics

(General Elective) (CAN)

(New Course)

Time : 2 Hours]

[Total Marks : 50

Instructions :

(1)

नीचे दृशावेव निशानीवाणी विगतो उत्तरवडी पर अवश्य कभवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
☛ Third Year B. Sc. (Sem. VI) (Physics)	<div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: 150px; height: 100px; margin: 0 auto;">Student's Signature</div>
Name of the Subject :	
☛ Electronics (General Elective) (CAN) (New Course)	
☛ Subject Code No. : <input type="text" value="3"/> <input type="text" value="2"/> <input type="text" value="1"/> <input type="text" value="9"/> ☛ Section No. (1, 2,.....) : <input type="text" value="NIL"/>	

- (2) The marks shown on right is the full marks of Question.
- (3) The symbols used in the question paper have their usual meaning.
- (4) Scientific calculators can be used.

1 Answer the following as required in brief : 8

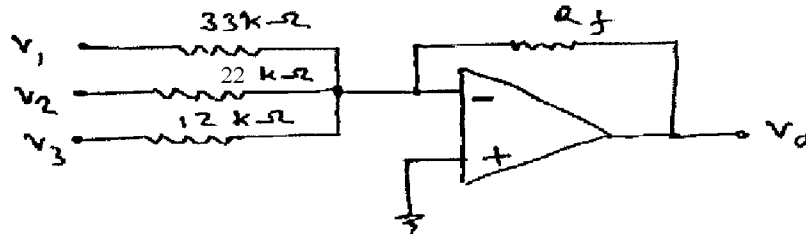
- (1) Define CMRR.
- (2) Define Slew Rate.
- (3) Write down Barkhausen criterion.
- (4) Define feedback.
- (5) What are OP AMP characteristics?
- (6) Write down advantages of -ve feedback amplifier.
- (7) Write down the names of the types of negative feedback.
- (8) Draw the circuit of OP AMP voltage buffer.

2 (a) Answer any one of the following in detail : 10

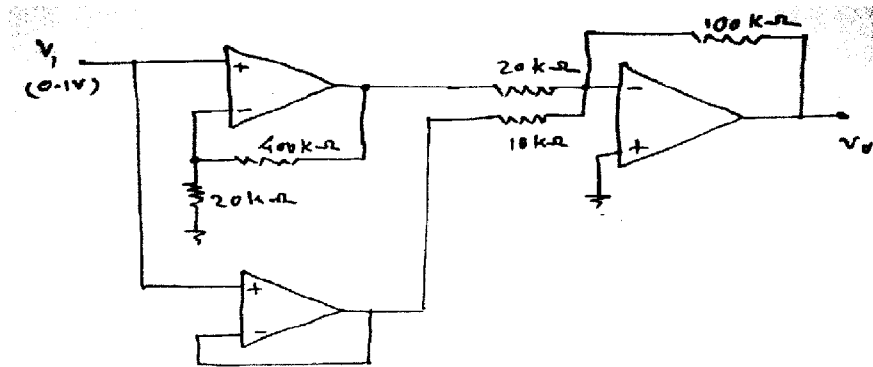
- (1) Explain the "OP-AMP basics". Derive expression for the voltage gain for inverting OP-AMP.
- (2) For OP-AMP, explain the working of single ended input operation, double ended input operation, double ended output operation and common mode operation with proper circuit and waveforms.

(b) Attempt any one of the following : 4

- (1) Calculate the output voltage V_0 for $V_1 = 0.2V$, $V_2 = -0.5V$, $V_3 = 0.8V$ and $R_F = 330k\Omega$.



- (2) Calculate the output voltage.



3 (a) Answer any one of the following in detail : 10

- (1) Draw the circuit of transformer coupled class-A amplifier. Explain transformer action, voltage transformation, current transformation, impedance transformation. Also explain operation of amplifier stage with DC and AC load line with graph.

- (2) Explain construction and working of an UJT. Also draw the V-I characteristics of UJT and explain it.
- (b) Attempt any one of the following : 4
- (1) Write a short note on Tunnel Diode.
- (2) Write a short note on Solar Cell.
- 4 (a) Answer any one of the following in detail : 10
- (1) For voltage-series feedback amplifier, derive the equation for the voltage gain with feedback (A_f), input impedance with feedback (Z_{if}) and output impedance with feedback (Z_{of}) .
- (2) What is the need of oscillator? In which types the oscillators are classified? Explain briefly. Explain the principle of positive feedback oscillator with due block diagram and condition for sustained oscillations. Explain the practical consideration of building up the oscillations.
- (b) Attempt any one of the following in detail : 4
- (1) Draw the circuit diagram for FET based Colpitt's and Hartley oscillator with equation of frequency.
- (2) Calculate the gain, input and output impedance of a voltage-series feedback amplifier having $A = -300$, $R_i = 1.5 \text{ k}\Omega$, $R_o = 50 \text{ k}\Omega$ and $\beta = (-1/20)$.
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