



AD-3219

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

March / April – 2015

Electronics

(Generic Elective)

(New Course)

Time : 2 Hours]

[Total Marks : 50

Instructions :

(1)

नीचे दृष्टावेव निशानीवाणी विगतो उत्तरवही पर अवश्य लखवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
B. SC. (PHYSICS) (SEM. VI)	<input type="text"/>
Name of the Subject :	<input type="text"/>
ELECTRONICS (NEW)	<input type="text"/>
Subject Code No. : <input type="text"/> 3 <input type="text"/> 2 <input type="text"/> 1 <input type="text"/> 9	<input type="text"/>
Section No. (1, 2,.....) : <input type="text"/> Nil	
	Student's Signature

- (2) Draw neat diagram wherever necessary.
(3) Figures to the right indicate full marks of the question.
(4) Symbols used in the question paper have their usual meaning.
(5) Scientific calculator may be used.

- 1 (a) Give correct answer from the multiple choice: **6**
- (1) Series derived series feedback the input resistance is _____ .
(a) Increase
(b) Same
(c) Decrease
(d) None of the above
- (2) Negative feedback is employed in _____ .
(a) Oscillator
(b) Rectifier
(c) Amplifier
(d) None of the above
- (3) An UJT has _____ Pn junction.
(a) One
(b) Two
(c) Three
(d) None of the above

- (4) The solar cell is capable of converting light energy in the form of photon into _____ .
- Magnetic energy
 - Mechanical energy
 - Electrical energy
 - None of the above
- (5) In class B-operation zero input signal is applied, the collector current is_____.
- Maximum
 - Zero
 - Between zero and maximum
 - None of the above
- (6) An SCR has _____ layer semiconductor device.
- Two
 - One
 - Four
 - Three.

(b) Answer the following question in short (any four) 8

- In voltage amplifier, $Z_o = 6 k\Omega$, $Z_{if} = 6 k\Omega$, $Z_{of} = 1 k\Omega$. What is Z_i ?
- Define CMRR. What is ideal value of it?
- In negative feedback amplifier, calculate β and A_f if loop gain is 5 and $A = -100$.
- Draw circuit diagram of Hartley oscillator using Op-Amp.
- If $L_1 = 50\text{mH}$ and $L_2 = 0.5\text{H}$, What is the value of A_f and B ?
- Enlist four merits of negative feedback.

2 (a) What is op-amp? Why it is called? Using basic 7
op-amp circuit, obtain the equation for voltage gain.

OR

- (a) Explain differential and common mode operation amplifier.
- (b) Calculate the output voltage of an op-amp for input voltages of $V_{i_1} = 150 \mu V$; $V_{i_2} = 140 \mu V$. The amplifier has a differential gain $A_d = 4000$ and the value of CMRR is 100. 5

OR

- (b) Calculate the output voltage of an op-amp summing amplifier for the following sets of voltage and resistors.

Use (i) $R_f = 2M\Omega$ and $R_f = 1M\Omega$

$V_1 = +1V, V_2 = 2V, V_3 = 3V, R_1 = 500k\Omega, R_2 = 1M\Omega$ and $R_3 = 1M\Omega$.

- 3 (a) Show that maximum collector efficiency of class A transformer coupled power amplifier is 50%. 7

OR

- (a) Explain the construction, operation and VI characteristic of SCR.
- (b) Calculate the efficiency of a transformer coupled class A amplifier for a supply of 12V and output of : 5
- (a) $V_{pp} = 24V$ and
- (b) $V_p = 6V$

OR

- (b) Explain the construction, operation and application of thermistor.

- 4 (a) What is concept of feedback? Explain equation for gain, output and input impedance with feedback in case of current series feedback. 7

OR

- (a) Draw the circuit diagram of colpits oscillator.
Explain the function of each component and obtain equation for operating frequency.
- (b) Calculate the feedback gain, gain with feedback and z_{if} for the current series feedback amplifier having $A = -100$, $Z_o = 2 k\Omega$, $z_{of} = 10 k\Omega$ and $Z_i = 1 k\Omega$. 5

OR

- (b) In colpits oscillator, If $C_1 = 750$ PF, $C_2 = 2500$ PF and $L = 40 \mu H$. Calculate :
- (a) Operating frequency and
- (b) Feedback gain and feedback ratio.
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