



DG-1444
M. Sc. (Tech.) (Sem. III) in Instrumentation
Examination
March / April – 2016
Integrated Circuits & Its Applications in
Instrumentation

Time : Hours]

[Total Marks :

Instructions :

(1)

<p>नीचे दर्शायेव निशानीवाणी विगतो उत्तरवडी पर अवश्य कपनी. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination : M. SC. (TECH.) (SEM. III) IN INSTRUMENTATION</p> <p>Name of the Subject : INTEGRATED CIRCUITS & ITS APPLICATIONS IN INSTRUMENTATION</p> <p>Subject Code No. : 1 4 4 4 Section No. (1, 2,.....): Nil</p>	<p>Seat No. : <input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/></p> <p style="text-align: center; border: 1px solid black; border-radius: 15px; padding: 10px;">Student's Signature</p>
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(2) Figures to the right indicate full marks.

(3) Assumed necessary data if required.

1 Attempt any two

14

- A) Which type of feedback is used in inverting op-amp? Derive exact expressions for voltage gain, input resistance, output resistance and bandwidth for inverting op-amp.
- B) Derive the expression for voltage gain , input resistance, output resistance and bandwidth of an inverting amplifier using op-amp with negative voltage shunt feedback.
- C) Explain working of monostable multivibrator using IC 555 with internal blocks. Mention applications of monostable and astable multivibrator using 555 timer.
- D) For an astable multivibrator using 555 Timer, $R_A=4.7K\Omega$, $R_B=1K\Omega$, and $C=.05\mu F$, determine the positive pulse width, negative pulse width and the free running frequency.

2 Attempt any two

14

- A) Explain with necessary diagrams the working of AC amplifiers (inverting and non inverting) with single supply voltage.
- B) Draw the circuit of basic integrator using an op-amp. What are the problems associated with this configuration? How they are overcome?
- C) Explain wide band-pass filter with necessary circuit, derivation and waveforms
- D) Draw the circuit of basic differentiator using an op-amp. What are the problems associated with this configuration? How they are overcome?

- 3 Attempt any two 14
- A) Explain working of 555 timer based monostable multivibrator. Design the same for the output pulse width of 10 ms.
 - B) Draw circuit diagram of an astable multivibrator using IC 555 and explain its operation. Derive expression for frequency of operation and duty cycle.
 - C) Explain generation of DSB-SC Signal
 - D) Explain Envelope detector and square law detector
- 4 Attempt any two 14
- A) Explain first order low pass Butterworth filter with necessary circuit, derivation and waveforms
 - B) Design first order low pass Butterworth filter at cut-off frequency of 1 KHz with pass band gain of 2. Draw circuit with component value.
 - C) Draw and explain the block diagrams of 555 Timer
 - D) Derive the equation of power for AM Signal.
- 5 Attempt any two 14
- A) Explain all the three open loop Op-Amp configurations.
 - B) Explain the working of a Voltage to Current converter with floating load. Illustrate the application of this circuit as a Zener diode tester.
 - C) Explain Envelope detector and square law detector
 - D) Draw and explain the block diagrams of Op-amp
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