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Total Number of Pages: 02

B.Tech.
PET5J008

5th Semester Regular Examination 2017-18

Advanced Analog Electronic Circuit

BRANCH: ECE, ETC

Time: 3 Hours

Max Marks: 100

Q.CODE: B463

Answer Question No.1 and 2 which are compulsory and any four from the rest.

The figures in the right hand margin indicate marks.

- Q1** **Answer the following questions: *multiple type or dash fill up type*** **(2 x 10)**
- a) The flip-flop circuit components must be chosen so that under maximum load which the binary devices, one transistor remains in ----- while the other is -----.
 - b) Commutating capacitors, also called ----- or ----- capacitors are used to increase the speed of operation.
 - c) The resolution time of a binary can be improved by ----- and -----.
 - d) Astablemultivibrator can be used as a ----- to ----- convertor.
 - e) In bootstrap circuit, the gain A of the -----amplifier should be -----.
 - f) The output of a time-base generator is called the ----- and the time-base generators are called -----.
 - g) In simple current time-base generator when the resistance of the coil and the resistance of the transistor in saturation are considered, a ----- voltage rather than a ----- voltage is applied across the inductor to obtain a linear current.
 - h) Tunnel diode is ----- and UJT is ----- type of devices.
 - i) PLL goes through -----, -----, and ----- states.
 - j) The duration of pulse is determined by the -----network connected ----- to the 555 timer.
- Q2** **Answer the following questions: *Short answer type*** **(2 x 10)**
- a) What do mean by linear wave shaping?
 - b) Why sinusoidal waveforms are popular?
 - c) What do mean by cut-off frequency? Write the expression for the upper cut-off frequency of a low pass filter?
 - d) What is the relation between rise time and band width of a low pass filter?
 - e) For an RC low-pass circuit, If $RC = 15 T$, find out the phase shift between input and output?
 - f) What do mean by a multivibrator? How many states does it have?
 - g) What is the basis for selection of various components of a multivibrator?
 - h) What are the advantages of a self-biased binary over fixed biased binary?
 - i) What do mean by loading of a binary? What are its effects on the performances a binary?
 - j) Write the expression for the maximum frequency of operation f_{max} of fixed-biased binary with a commutating capacitor c?
- Q3** a) Classify active filter on the basis of their frequency response? Derive the cut-off frequency of these filters? **(10)**
- b) Design a low pass active filter at cut-off frequency of 1 KHz and pass band gain of 4. Plot the approximate frequency response and analyze your results? **(5)**

- Q4** a) With proper circuit diagram discuss the detailed operation of collector coupled bistable-multivibrator. Using proper assumption find out all the stable state voltages and currents. (10)
b) What do mean by speed-up capacitor? Derive a suitable expression for this ? (5)
- Q5** a) Explain the operation of UJT? Briefly explain how UJT is used to operate as bistable, monostable and astablemultivibrators. (10)
b) Discuss the triggering mechanism in the bistablemultivibrator. (5)
- Q6** a) What are the different methods for generating a voltage time base generator? Explain any one method for generation of time base wave form? (10)
b) Define the terms slope error, displacement error, and transmission error? Derive a suitable relation between these errors? (5)
- Q7** a) Explain the operation of collector coupled Astable-multivibrators? Derive the expression of frequency of oscillation of an astable-multivibrator? (10)
b) Silicon n-p-n transistor with $h_{FE(min)} = 40$ are available. Design an astablemultivibrator to generate a square wave of 1 KHz frequency with duty cycle of 25%. (5)
- Q8** a) With complete connection diagram explain the operation of 555 timer. Explain the operation of monostablemultivibrator using 555 timer. (10)
b) Difference between UJT and Tunnel diode. (5)
- Q9** a) Discuss the detail operation of individual block of a discrete PLL. (10)
b) Write down the advantages, disadvantages, and applications of an instrumentation amplifier. (5)