



17319

21415

3 Hours/100 Marks

Seat No.

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- Instructions :** (1) **All** questions are **compulsory**.
(2) Answer **each next** main question on a **new** page.
(3) Illustrate your answers with **neat** sketches **wherever** necessary.
(4) Figures to the **right** indicate **full** marks.
(5) Assume **suitable** data, if **necessary**.
(6) Mobile Phone, Pager and any other Electronic Communication devices are **not permissible** in Examination Hall.
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MARKS

1. A) Attempt **any six** :

12

- a) State any four application of transistor.
- b) Define transistor. Explain why an ordinary junction transistor is called a bipolar device ?
- c) Give the classification of FET.
- d) What are different types of amplifier coupling ?
- e) State the meaning of small signal amplifier. List two application of it.
- f) What is the effect of negative feedback on the performance of amplifier ?
- g) State the need of regulator.
- h) State the function of comparator or error amplifier in series voltage regulator.

P.T.O.



B) Attempt **any two** :

8

- a) What are the requirements of transistor biasing ? Draw the circuit diagram of base biased with emitter feedback.
- b) Draw the circuit diagram of two stage transformer coupled amplifier and explain function of each component.
- c) Draw the functional block diagram of IC 723. Give any four important features of IC 723.

2. Attempt **any four** :

16

- a) Compare the following biasing method of transistor in detail :
 - i) Base resistor method.
 - ii) Feedback resistor method.
 - iii) Voltage divider method.on stability and circuit diagram.
- b) Describe the working principle of n-channel JFET with diagram.
- c) State the advantages and disadvantages of direct coupled amplifier.
- d) Draw the block diagram of voltage shunt negative feedback. Write its effect on voltage gain, bandwidth.
- e) Draw the circuit diagram of voltage time base generator and describe its working.
- f) Draw block diagram of shunt voltage regulator and describe working of each block.

3. Attempt **any four** :

16

- a) Describe the working of transistor as a switch and give the application of it.
- b) How P-channel JFET is used as an amplifier ?
- c) Draw the diagram of class-B push-pull amplifier and explain its working.



MARKS

- d) In a single stage voltage amplifier, voltage gain without feedback is 80, input resistance (R_i) = $800\ \Omega$ and output resistance (R_o) is $8K\ \Omega$. If 20% output voltage is feedback in series with input, determine A_{vf} , R_{if} and R_{of} of the negative feedback amplifier.
- e) Describe UJT as a relaxation oscillator with circuit diagram and waveform.
- f) Draw and describe the working of zener diode as a voltage regulator.

4. Attempt **any four** :

16

- a) Define following terms related to transistor current amplification factor (α , β , γ).
- b) What is thermal runaway and how it can be avoided ?
- c) Draw the circuit diagram of double tuned amplifier and describe its operating principle.
- d) Compare Class A, Class B, Class AB, Class C power amplifiers on :
 - i) efficiency
 - ii) conduction angle.
- e) Describe the Barkhausen's criterion for sustained oscillations.
- f) In UJT sweep circuit, calculate time period and frequency of oscillation if $\eta = 0.62$, $R = 5K\ \Omega$, $C = 0.05\ \mu F$.

5. Attempt **any four** :

16

- a) Draw the circuit diagram of transistor in common emitter configuration and draw input and output characteristics.
- b) Describe the working of a n-channel D-MOSFET with diagram.
- c) Draw the nature of frequency response of two stage RC coupled amplifier and describe it.
- d) Describe the working of transistorised crystal oscillator with the help of circuit diagram.
- e) Draw the bootstrap sweep circuit and describe its working with waveforms.
- f) Describe the working of 79XX series voltage regulator.



6. Attempt **any four** :

16

- a) Explain the operating principle of PNP transistor.
 - b) Describe construction, operation of E-MOSFET.
 - c) Draw circuit diagram of practical single stage CE-amplifier and state the function of each component.
 - d) Compare amplifier and oscillator for :
 - 1) Feedback.
 - 2) Application.
 - e) Draw the block diagram of DC regulated power supply and describe the working of each block.
 - f) Draw the circuit diagram of Miller's sweep generator and state its application.
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