(Pages : 2) Name..

Reg. No....................................

SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Electronics

ELE 2C 02—ELECTRONIC CIRCUITS

Time : Two Hours   Maximum : 60 Marks

Section A

*Answer at least **eight** questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1. Why bridge rectifier is preferred to a centre-tapped two diode rectifier ?

2. What is the basic purpose of a filter circuit ?

3. Define voltage regulation.

4. What are the factors affecting the stability of Q-point ?

5. Define current gain of a common emitter amplifier.

6. Draw the frequency response of RC coupled amplifier.

7. Explain two basic types of feedback in amplifiers.

8. Why power amplifiers are also known as large signal amplifiers ?

9. Define the term power dissipation capability as applied to power amplifiers.

10. What do you meant by an electronic oscillator ?

11. State two Barkhausen conditions required for sustained oscillations.

12. What is the basic difference between astable and monostable multivibrator ?

(8 × 3 = 24 marks)

Section B

*Answer at least **five** questions.*
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.

13. Define ripple factor. Derive the equation for ripple factor of a full wave rectifier.

14. With neat diagram explain the working of SMPS.

Turn over

15. Mention the importance of a biasing circuit and explain any one type of biasing.

16. List the advantages and disadvantages of employing negative feedback in amplifiers.

17. Explain the classification of power amplifiers in detail.

18. Briefly explain the basic principle of RC oscillators.

19. What is a multivibrator ? Explain the principle on which it works.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. With neat diagram explain the working of RC coupled amplifier. List its advantages and disadvantages.

21. With the help of waveforms explain the working of monostable multivibrator.

(1 × 11 = 11 marks)

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Name...................................

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SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Electronics

ELE 2B 02—ELECTRONIC CIRCUITS

Time : Two Hours   Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1. What are the advantages of bridge rectifier over centre tapped rectifier.

2. Draw the circuit of a negative clamper clamping at + 2 V.

3. Draw the circuit and frequency response of RC Differentiator.

4. What is a tuned amplifier ?

5. Draw the D.C. load line and mark the Q point on transistor characteristics.

6. A multistage amplifier employs five stages each of which has a power gain of 30. What is the total gain of the amplifier in dB ? if a negative feedback of 10 dB is employed, find the resultant gain.

7. List out the reasons for amplitude distortion in amplifiers.

8. What are the advantages of class A amplifiers ?

9. What are the advantages of negative feedback over positive feedback ?

10. What is Barkheusen criterion for oscillation ?

11. Compare RC and LC oscillators.

12. What is the main drawback of fixed bias circuit with emitter resistor ?

(8 × 3 = 24 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.

13. Explain the working of a Zener diode regulator.

14. Derive the expression for ripple factor of full wave rectifier.

15. Compare Class A, Class B and Class C amplifiers.

16. Draw the circuit of Wein Bridge oscillator and explain its working.

17. Explain the working of bistable multivibrator.

18. Draw the circuit of emitter follower. What are the advantages and applications of emitter follower.

19. What is crossover distortion in class B amplifiers ? How it can be eliminated ?

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Explain the working of any one type of full wave rectifier with and without filter.

21. Draw the circuit of RC coupled amplifier. Also draw the *h*-parameter equivalent circuit and derive expressions for voltage gain, current gain, input impedance and output impedance.

(1 × 11 = 11 marks)

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION APRIL 2021

Electronics

ELE 2C 02—ELECTRONIC CIRCUITS

Time : Three Hours   Maximum : 64 Marks

Part A

Answer **all** *questions.*
Each question carries 1 mark.

1. Ripple factor of half wave rectifier is ———————.

2. Capacitor filter is usually used in ——————— load circuits.

3. The Ripple factor of inductor filter is given by ———————.

4. Zener diodes with breakdown voltage greater than 5 V operates predominantly on ——————— breakdown.

5. For a voltage amplifier the Q-point selected at the ——————— region of the load line.

6. The gain-bandwidth product of an amplifier is approximately ———————.

7. ——————— feedback amplifier is the most efficient one.

8. The 7905 regulator can have a fixed output voltage of ——————— volts.

9. Class C amplifiers are used in ——————— modulation.

10. The gain of the amplifier for an RC phase shift oscillator should at least be ———————.

(10 × 1 = 10 marks)

Part B

Answer **all** *questions.*
Each question carries 2 marks.

11. What are filters and why do we need it ?

12. What is voltage regulation ?

13. What do you mean by Q-point ?

Turn over

14. Define voltage gain, current gain and power gain of an amplifier.

15. What is the gain of an amplifier with negative feedback ?

16. What is thermal run away ?

17. What are multivibrators ?

(7 × 2 = 14 marks)

Part C

Answer any **five** *questions.*
Each question carries 4 marks.

18. Explain how rectification is done in a bridge rectifier.

19. Give the working of SMPS.

20. Draw the circuit of a RC coupled amplifier and explain its operation.

21. Explain the frequency response of an amplifier.

22. Discuss the effect of positive and negative feedback in amplifiers.

23. Draw the circuit of a class A amplifier.

24. What are the various types of LC oscillators ?

25. How 555 IC can be configured as an astable multivibrator ?

(5 × 4 = 20 marks)

Part D

Answer any **two** *questions.*
Each question carries 10 marks.

26. Draw and explain the working of a LC filter. Derive the expression for ripple factor.

27. Compare the various biasing circuits in terms of stability factor.

28. Explain the circuit and operation of a current series feedback amplifier with the expression for voltage gain, input and output impedances.

29. With a neat circuit diagram, explain the working of a Colpitt's oscillator.

(2 × 10 = 20 marks)

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION APRIL 2021

Electronics

ELE 2B 02—ELECTRONIC CIRCUITS

Time : Three Hours   Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 1 mark.

1. ——————— Ω resistance must be connected across a 100 K Ω. resistance to reduce the equivalent resistance to 50 K Ω.

2. With 100V applied across ten 50 Ω resistances in parallel, the current through each resistance equals ———————.

3. A sinusoidal voltage has an r.m.s value of 10V. Its peak to peak value is ———————.

4. A triangular waveform can be generated by :

    (a) Differentiating a square wave.

    (b) Integrating a square wave.

    (c) Differentating a sinusoidal wave.

    (d) Integrating a sinusoidal wave.

5. The ripple factor of full wave rectifier is ———————.

6. The percentage voltage regulation of voltage supply providing 100V unloaded and 95V at full load is ———————.

7. The negative part of the output signal in a transistor circuit starts clipping, if Q point of the circuit moves

    (a) Towards the saturation point.

    (b) Towards the cut-off point.

    (c) Towards the center of the load line.

    (d) None of the above.

Turn over

8. Which of the following is not correct regarding h parameter of transistor ?

    (a)   The values of h parameter can be obtained from transistor characteristics.

    (b)   Their values depends upon the transistor configuration.

    (c)   Their values depend upon operating point.

    (d)   They are four in number.

9. In class-A amplifier the current in the output circuit flows for :

    (a) $360°$.   (b) $180°$

    (c) $90°$ (d)   Less than $90°$.

10. A monostable multivibrator :

    (a)   Gives one output pulse for one input trigger pulse.

    (b)   Gives two output pulses for one input trigger pulse.

    (c)   Has one stable state.

    (d)   Both (a) and (c).

$(10 \times 1 = 10$ marks$)$

Part B

Answer any **five** *from seven.*
Each question carries 2 marks.

11. Compare a bridge rectifier with centre tapped full wave rectifier

12. What is a regulated power supply ? Draw its block diagram.

13. Draw the circuit diagram of any clipper and its output waveform.

14. What is the purpose of biasing a transistor ?

15. Draw the circuit of a Darlington amplifier ?

16. Compare negative feedback and positive feedback with respect to amplifier gain.

17. Why an LC tank circuit, once excited, does not produce sustained oscillations ?

$(5 \times 2 = 10$ marks$)$

Part C

Answer any **six** *from eight.*
Each question carries 5 marks.

18. Derive an expression for the input impedance and output impedance with feedback of a voltage series feedback amplifier

19. Derive equation for voltage gain of a CE amplifier in terms of h parameters, (neglect h_{ie} and h_{oe})

20. What is a Ripple ? Derive the ripple factor of half wave rectifier circuit.

21. Draw the DC load line and find the operating point of a fixed bias BJT circuit with the following parameters : $V_{cc} = 20V$, $R_c = 2K\Omega$, $R_B = 400\ K\Omega$. Assume $\beta = 100$ and neglect V_{BE}.

22. Prove that the maximum efficiency of Class B Push -Pull amplifier is 78.5%.

23. An amplifier has a value of $A_v = 1000$ and $\beta = 0.22$. Determine the value of A_v' for the circuit.

24. Determine the operating frequency of a transistor Hartley Oscillator, if $L_1 = 100\ \mu H$, $L_2 = 1\ mH$, $M = 20\ \mu H$ and $C = 20\ pF$.

25. With circuit diagram and waveforms, explain the working of RC integrator.

(6 × 5 = 30 marks)

Part D

Answer any **two** *from four.*
Each question carries 15 marks.

26. Draw the circuit diagram of a center tapped wave rectifier. Explain its operation with waveforms. Derive the expression for its output DC voltage and ripple factor.

27. With neat circuit diagram explain the working of RC phase shift oscillator using BJT. Give the equation for the frequency of oscillation and condition of sustained oscillation.

28. Why biasing is necessary in BJT amplifier ? Explain the concept of DC and AC load line with neat diagram. How will you select the operating point, explain it using CE transistor characteristics ?

29. With neat circuit diagram explain the working of an astable multivibrator circuit using BJT. Draw the waveforms at the base and collector of one transistor. Give the expression for time period.

(2 × 15 = 30 marks)