KUMARAGURU
college of technology
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GENERAL INSTRUCTIONS TO THE CANDIDATES

1. Candidates are instructed to answer the questions as per Bloom's Taxonomy knowledge level (K_1 to K_6)

2. Candidates are strictly instructed not to write anything in the question paper other than their roll number.

3. Candidates should search their pockets, desks and benches and handover to the Hall Superintendent/ Invigilator if any paper, book or note which they may find therein as soon as they enter the examination hall.

4. Candidates are not permitted to bring electronic watches with memory, laptop computers, personal systems, walkie-talkie sets, paging devices, mobile phones, cameras, recording systems or any other gadget / device /object that would be of unfair assistance to him / her.

5. Corrective measures as per KCT examination policies will be imposed for malpractice in the hall like copying from any papers, books or notes and attempting to elicit the answer from neighbours.

B.E/B.TECH DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2014)

Second Semester

U14EET212: ELECTRICAL AND ELECTRONIC CIRCUITS

(Common to CSE & IT)

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Three 2 ohm resistors are connected to form a triangle. The resistance between any two corners is   [K_2]

   a) 6 ohms   b) 2 ohms

   c) (3/4) ohms   d) (4/3) ohms

2. In any given time in intrinsic semiconductor material at room temperature,   [K_2]
   i)electrons drift randomly ii) recombination occurs iii) holes created. Which of the above are true?

a) i, ii and iii b) ii and iii

c) i and iii d) i and ii

3. The form factor of a _____ wave is 1. [K$_1$]

a) sinusoidal b) square

c) triangular d) Saw tooth

4. An R-L series a.c circuit has 15 V across resistor and 20 V across the inductor. The supply voltage is _____. [K$_2$]

a) 35 V b) 5 V

c) 25 V d) √175 V

5. The current in a circuit follows a relation i=50 sinωt. If the frequency is 50 Hz, find the value of current at t=2 ms, where ω is the angular velocity in rad/s. [K$_2$]

a) 29.38 A b) 0 A

c) 23.98 A d) 31.39 A

6. Consider the following rectifier circuits, 1) Half wave rectifier without filter 2) Full wave rectifier without filter 3) Full wave rectifier with capacitor filter. The sequence of these rectifier circuit in decreasing order of their ripple factor is [K$_1$]

a) 3,2,1 b) 1,2,3

c) 1,3,2 d) All have same ripple factor

7. In transistor configuration which provides highest output impedance is [K$_1$]

a) Common emitter b) Common base

c) Common collector d) Both (a) and (b)

8. Assertion (A): Early effect is the phenomenon which occurs in BJT [K$_2$]

Reason (R): Large reverse voltage is applied to the Emitter base junction of BJT

a) both A and R are individually true and R is the correct explanation of A b) both A and R are individually true but R is not the correct explanation of A

c) A is true but R is false d) A is false but R is true

9. Feedback in an amplifier always helps to [K$_1$]

a) Controls its output b) Increase its gain

c) Decrease its input impedance d) Stabilize its gain

10. Match the following items.   [K₂]

List I	List II
A. JFET	i. Sine wave generator
B. SCR	ii. High input resistance
C. MOSFET	iii. Four layer device
D. Oscillators	iv. Silicon dioxide

	A	B	C	D
a)	i	iii	ii	iv
b)	ii	iii	iv	i
c)	iii	ii	iv	i
d)	iv	i	iii	ii

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. State the limitations of ohm's laws.   [K₁]

12. Distinguish between series and parallel circuits.   [K₂]

13. Define average and peak values.   [K₁]

14. A 5 ohms resistor, 0.02 H inductor and 5 µF capacitor are connected in series. Find the resonance   [K₂]
    frequency at resonance.

15. Tell the features of bridge rectifier.   [K₁]

16. What is the purpose of an additional RC filter section in a power supply circuit?   [K₂]

17. Why CC configuration is called as emitter follower?   [K₂]

18. Define holding and latching current in SCR.   [K₁]

19. Give the merits of RC phase shift oscillators.   [K₂]

20. Mention the parameters of ideal op-amp.   [K₂]
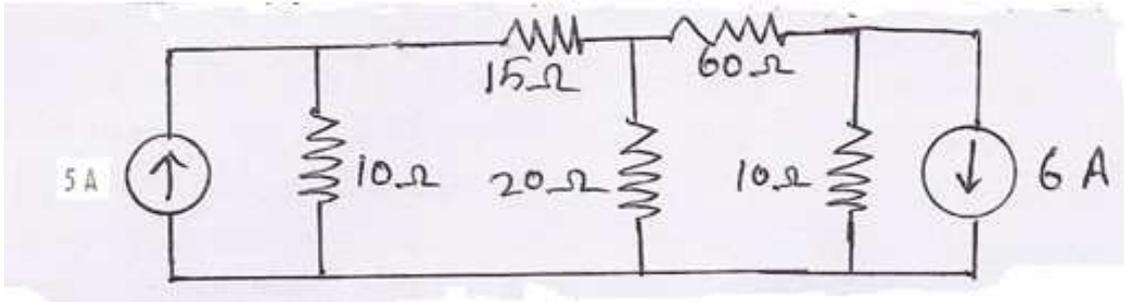
Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. Explain the construction and working of Hartley oscillator with neat sketch.   [K₁]

22. From the below circuit, find the current passing through the 15 Ω resistor by nodal analysis. [K$_2$]

23. With neat circuit diagram explain the working of full wave rectifier and derive its parameters. [K$_2$]

24. Draw and explain the construction and working of n- channel JFET with its characteristics. [K$_1$]

25. (i) Briefly explain the V-I characteristics of SCR. (7) [K$_1$]

    (ii) Summarize the parameters comparison of three transistor configurations. (7) [K$_2$]

26. For a series RL circuit derive the expression for voltage, current and power. Also draw the phasor diagram. [K$_2$]

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