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: DEC 2015

(Regulation 2014)

Third Semester

U14EET311: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to AERO/FT/TXT)

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The magneto motive force of a 75 turn coil is 300At. The current passing through it is   CO2 [K_3]
   a) 4A   b) 6A
   c) 8A   d) 10A

2. Ohm's law holds good only at   CO1 [K_2]
   a) Constant temperature   b) Constant current
   c) Constant voltage   d) Constant power

3. The power dissipated by a resistor of 8 Ohms when a current of 3A passes through it   CO1 [K_2]
   a) 120W   b) 720W
   c) 320W   d) 72W

4. Sine wave A has a positive-going zero crossing at 45°. Sine wave B has a CO2 [K₃] positive-going zero crossing at 60°. The phase relationships are
   (i) Wave A lags wave B by 15°
   (ii) Wave A leads wave B by 15°
   (iii) Wave B leads wave A by 15°
   (IV) Wave B lags wave A by 15°
   a) (i) is correct   b) (ii) is correct
   c) (ii) and (iv) are correct   d) (i) and (iii) are correct

5. The average value of a 12 V peak sine wave over one complete cycle is   CO2 [K2]
   a) 7.64   b) 0 V
   c) 1.27 V   d) 6.37 V

6. Assertion (A): The resistivity of a material is directly proportional to the   CO2 [K₃] area
   Reason (R) : Indirectly proportional to its length
   a) Both A and R are true and R is a   b) A is true but R is false
      correct explanation of A
   c) R is true but A is not related with R   d) Both A and R are true and R is
                                                  not correct explanation of A

7. Assertion (A): The retentivity is depends on type of a material   CO2 [K3]
   Reason (R) : Coercivity is negative value of magnetizing force (H)
   a) Both A and R are true and R is a   b) A is true but R is false
      correct explanation of A
   c) R is true but A is not related with R   d) Both A and R are true and R is
                                                  not correct explanation of A

8. Power factor of following circuit will be zero   CO2 [K₂]

   (i) Pure resistance
   (ii) Pure inductance
   (iii) Pure capacitance
   (iv) Combination of resistance and inductance
   a) (i) is correct   b) (ii) is correct
   c) (ii) and (iii) is correct   d) (i) and (iv) is correct

9. If the rms voltage drop across a 15 k Ω resistor is 16 V, the maximum current   CO2 [K₃] through the resistor is
   a) 1.5 mA   b) 15 mA
   c) 1 mA   d) 10 mA

10. Matching type item with multiple choice code   CO1 [K2]

List I	List II
A. Current	1. Columbs
B. Resistance	2. Amps
C. Energy	3. Ohms
D. Charge	4. KWhr

	A	B	C	D
a)	1	2	3	4
b)	4	3	2	1
c)	2	3	4	1
d)	3	4	1	2

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. Draw slip-torque curve of cage rotor induction motor. CO4 [K₂]

12. Write the definition faradays law of electromagnetic induction? CO2 [K₂]

13. State ohm's law. CO1 [K1]

14. Find the current passing through a 40W bulb when a voltage of 200V dc is applied across its terminals. CO3 [K₂]

15. Define capacitance. CO2 [K₁]

16. State faraday's laws of electromagnetic induction. CO3 [K₁]

17. What is magnetic field density? CO2 [K₂]

18. Compare full wave rectifier with half wave rectifier with respect of efficiency. CO4 [K₂]

19. DC series motor is always started with load, State the reason for it. CO5 [K₃]

20. Draw the not gate output using anyone universal gate, with truth table. CO5 [K₃]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. (i) A parallel plate capacitor has a dielectric permittivity 5 farad/m between two plates each of area 3000cm² and distance between them is 10cm Find the capacitance. (7) (CO1) [K2]
    (7) (CO1)

(ii) Derive an expression to find the capacitance of parallel plate capacitor

22. (i) The magnetic strength of a magnet with a square cross section of side 7cm is 0.5mwb; Find the value of magnetic flux density.   (7)   (CO2)   [K$_3$]

(ii) Derive an expression for the relation between reluctance and of flux(Φ).   (7)   (CO1)

23. A coil of inductance 0.06H and resistance 40Ω is connected in series with a capacitor of 108µF across the supply v(t) = 330 sin 366t V. Determine impedance, current, power factor, voltage drop across the coil and capacitor?   (CO2)   [K$_3$]

24. Explain principle of operation with neat diagram and write the voltage equation of DC shunt and series motor. Draw and discuss about speed-torque characteristics of shunt and series connected DC motor.   (CO4)   [K$_2$]

25. The output of a logic circuit is 1 when all its inputs are at logic 0.Draw the circuit diagram with the truth table. Explain it.   (CO5)   [K$_4$]

26. (i) Derive an expression to find out the energy stored in magnetic field?   (4)   (CO2)   [K$_2$]
(ii) Derive the RMS value, average value, form factor and crest factor of pure Sine waveform.   (10)

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