FACULTY OF ENGINEERING

B.E. II Semester (EE / Inst.) (CBCS)(Backlog) Examination,

December 2019 / January 2020

Subject: Electronic Engineering-I

Time: 3 Hours   **Max. Marks: 70**

Note: Answer All Questions From Part-A & any Five Questions From Part-B.

Part – A (20 Marks)

1. Determine the ac resistance for a semiconductor diode having a forward bias of 200mV and reverse saturation current of 1µA at room temperature.   2

2. Draw the circuit of bridge rectifier and give its advantages over other rectifiers.   2

3. Define   and   for a transistor and derive the relation between them.   2

4. What is operating point? Explain its physical significance.   2

5. What is stability factor?   2

6. How does TRIAC differs from an SCR?   2

7. What are the advantages of FET over BJT?   2

8. Write the applications of Photo diode.   2

9. Define Pinch-off voltage.   2

10. What are Hybrid parameters?   2

Part – B (50 Marks)

11. (a) Explain the formation of depletion region in an open circuit PN junction with neat sketches.   7
    (b) Explain about the temperature dependence of PN diodes.   3

12. (a) Draw the circuit of half wave PN junction diode rectifier and explain the operation with relevant sketches. Also obtain an expression for the ripple factor and efficiency of the same circuit.   6
    (b) Explain the construction and working principle of Light Emitting Diode (LED).   4

13. (a) Give the difference between ac and dc load line. Derive the load line equation of a BJT in common emitter configuration.   6
    (b) Explain working of BJT in CE configuration.   4

14. (a) A transistor has its H-parameters given by 1K ,50, 2.5×10^{-4} and 25µA/V in common emitter configuration using a load resistance of 5K and a source resistance of 1K .Calculate A_V, A_{VS}, A_I, A_{IS}, R_i, and R_o.   5
    (b) Draw and explain V-I characteristics of UJT.   5

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15 (a) Draw the structure of a JFET and explain its principle of operation with neat diagrams along the V-I characteristics. Define pinch-off voltage and mark it on the characteristics.   6

(b) Describe the construction and working principles of MOSFET in Enhancement Mode and Depletion mode.   4

16. (a) A bridge rectifier is supplying a load of 200mA at 30V.It uses a pi-section filter with a choke of 0.5H and two capacitors each of 80µF.Assume supply frequency of 50Hz.   7
    Find (i) The input r.m.s voltage of secondary of the transformer
        (ii)The percentage ripple in the output.

(b) Draw the input and output characteristics of BJT in common Base configuration.   3

17 Write short notes on any of two of the following: 10
  (a) DIAC
  (b) CC amplifier
  (c) CRO.

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FACULTY OF ENGINEERING

BE (ECE) II Semester (CBCS)(Backlog) Examination, December 2019/January 2020

Subject: Electrical Technology

Time: 3 Hours   **Max Marks: 70**

Note: Answer all the questions from Part-A &Any five Questions from Part-B

Part – A (2 x 10 = 20 Marks)

1 What is the significance of Back emf?
2 Draw the magnetization characteristics of a shunt generator
3 Draw the vector diagram and give the mathematical expression for voltage regulation of a single phase transformer
4 Distinguish between the balanced and unbalanced system of load
5 A 12 pole 3 phase induction motor is operated on load, what is the synchronous speed?
6 How you would reverse the direction of rotation of single phase induction motor?
7 Define the synchronous impedance of an Alternator
8 Draw the diagram of Autotransformer and why is it called "Variac"
9 Write the relationship between, line, phase voltage and current in Delta connection.
10 Define voltage Regulation.

Part – B (5 x 10 = 50 Marks)

11 a) Explain the different characteristics DC shunt Motor.
   b) A 220V shunt motor has an armature resistance of 0.5ohms and takes an armature current of 40A on a certain load. By how much main flux be reduced to raise the speed by 50%if the developed torque is constant. Neglect the saturation an armature reaction.

12 a) Explain the condition for building up of a voltage of a shunt generator.
   b) A 4 pole Dc motor takes 20 A armature current .The armature has lap connected 480 conductors and the flux per pole 20milliWeb.Calculate the gross torque developed by the armature of the motor.

13 a) Explain how the rotor rotates when three phase supply is given to the stator of the induction motor.
   b) Explain the speed control methods of Squirrel cage and sling ring induction motors

14 a) The power in a three phase load is measured by two wattmeter method. The load power measured is 100watts and the power factor is 0.66 lag. What are the readings of the wattmeter.
   b) A three phase voltage of 230V is applied to a three phase load of 3ohms. What is the power absorbed by each phase

15 a) Explain how the equivalent circuit parameters of the transformer are determined.
   b) Explain how the primary current increases when the load applied on the secondary of the transformer.

16 a) A 400v ,60hz ,8pole 3 phase induction motor runs at a speed of 1140rpm when connected, find the slip.
   b) Explain the power stages in a three phase induction motor.

17 Explain the open circuit characteristics and short circuit characteristics of an alternator and determine the voltage regulation.

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FACULTY OF ENGINEERING
BE II-Semester (CSE/IT) (CBCS) (Backlog) Examination, Dec. 2019 / Jan. 2020

Subject: Basic Electrical Engineering

Time: 3 Hours   Max. Marks 70

Note: Answer all questions from Part-A & any five questions from Part-B.
PART – A (2X10=20 Marks)

1. State and explain Ohm's Law.   [2]
2. A series circuit having the R = 60 and X_L = 80 . Determine the power factor for the ac circuit.   [2]
3. In the measurement of 3 phase power by two wattmeter method the wattmeter readings are W_1=100 and W_2=150. Calculate the power factor of the circuit.   [2]
4. Define voltage regulation in a transformer.   [2]
5. A 6 pole, lap wound dc generator has 600 conductors on its armature. The flux per pole is 0.02 Wb. Calculate the speed at which the generator must be run to generate 300 V.   [2]
6. Classify different types of DC Motors.   [2]
7. Define Slip.   [2]
8. Why 1-φ induction motors are not self-starting?   [2]
9. Define Two-part tariff.   [2]
10. What is a circuit breaker?   [2]

Part – B (5x10 = 50 Marks)

11. a) State and explain Thevenin's Theorem.   [5]

    b) A 220V, 1-φ, 50Hz ac supply is applied across series connection of R=10 , L=0.1H. Calculate impedance, current, v_R , v_L, power factor, active power and reactive power.   [5]

12 a) Derive the expression for measurement of 3-φ power by two-wattmeter method.   [5]
    b) Derive the EMF equation of a Transformer.   [5]

13. a) What are the different types of D.C. Generators? Explain.   [5]
    b) Explain the operation of 3-point starter with a neat sketch.   [5]

14. a) Draw and explain the Torque-Slip characteristics of a 3-φ Induction motor.   [5]

    b) Explain briefly about Capacitor Start & Capacitor Run 1-φ Induction motor.   [5]

15. a) Explain different types of consumers.   [5]
    b) Write briefly about earthing and its importance.   [5]

16. a) Analyze the single phase RL series AC circuit with a phasor diagram.   [5]
    b) Derive the condition for Maximum efficiency of a Transformer and Draw the efficiency curve.   [5]

17. Write short notes on:

    a) Auto transformer starting method of 3-φ Induction motor.   [5]
    b) EMF equation of a DC generator.   [5]

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