b. In an AC circuit, resistor R and inductor L are connected in series, voltage and current equations are given as

$e(t) = 200\sin 314t$ and

$i(t) = 20\sin(314t - 30°)$

Calculate

(i) RMS value of the voltage and current
(ii) Frequency
(iii) Power factor
(iv) Power
(v) Values of R and L

29. a. Explain the constructional features and working principle of DC generator with suitable diagram.

(OR)

b. The flux produced in the air gap between two electro magnetic poles is 0.05 Wb. If the cross sectional area of the air gap is 0.2 m^2, find

(i) Flux density,
(ii) Magnetic field intensity
(iii) Reluctance and
(iv) Permeance of the air gap

Find also the mmf dropped in the air gap, when the length of air gap is 1.2 cm.

30. a. Explain the working principle of moving coil instrument with suitable diagram.

(OR)

b. Write short notes on

(i) PN junction diode under forward bias condition
(ii) CE configuration of BJT

31. a. Explain the construction, working and applications of semiconductor strain gauges.

(OR)

b. Write short notes on

(i) Photovoltaic cell
(ii) Photoconductive cell

32. a.i. Simplify the Boolean function $Y = \sum m(3,5,6,7)$ using K-map and implement it using logic gates.

ii. Simplify the Boolean expression $Y = \left((AB' + ABC)' + A(B + AB')\right)'$.

(OR)

b. Write short notes on

(i) Frequency modulation
(ii) Amplitude modulation

* * * * *

Reg. No.														

B.Tech. DEGREE EXAMINATION, NOVEMBER 2018
First Semester

18EES101J – BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(For the candidates admitted during the academic year 2018-2019)

Note:

(i) **Part - A** should be answered in OMR sheet within first 45 minutes and OMR sheet should be handed over to hall invigilator at the end of 45th minute.
(ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: Three Hours Max. Marks: 100

PART – A (20 × 1 = 20 Marks)
Answer **ALL** Questions

1. Energy is dissipated in the form of heat in
(A) Resistor (B) Inductor
(C) Capacitor (D) Dielectric

2. For maximum power transfer to the load
(A) Load resistance must be equal to internal resistance of circuit (B) Load resistance must be greater than internal resistance of circuit
(C) Load resistance must be less than internal resistance of circuit (D) Load resistance must be equal to reciprocal of internal resistance of circuit

3. Form factor is the ratio of
(A) Maximum to RMS value (B) Maximum to average value
(C) RMS to average value (D) RMS to maximum value

4. Power factor is the ratio of
(A) Impedance to resistance (B) Resistance to reactance
(C) Resistance to impedance (D) Reactance to impedance

5. The unit of magnetic flux density is
(A) Henry/meter (B) Tesla
(C) Amp/meter (D) Volt/meter

6. The flux is analogous to
(A) Voltage in electric circuit (B) Current in electric current
(C) Power in electric circuit (D) Resistance in electric current

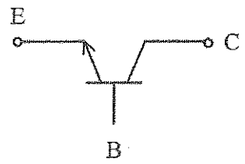
7. Which motor is constant speed motor?
(A) DC series motor (B) DC shunt motor
(C) DC compound motor (D) Induction motor

8. The primary winding of a transformer has 110 V across it. What is the secondary voltage if the turns ratio is 8?
(A) 8.8 V (B) 88 V
(C) 880 V (D) 8800 V

9. Moving parts of instruments are supported in
   (A) Bush bearings (B) Ball bearings
   (C) Roller bearings (D) Jewelled bearings

10. Diode is a/an_____
   (A) Unilateral elements (B) Bilateral element
   (C) Conducting element (D) Insulating element

11. Figure below represents:



   (A) NPN transistor (B) PNP transistor
   (C) Zener diode (D) Power diode

12. A single lamp controlled by two-way switches at two places is called
   (A) Stair case wiring (B) Corridor wiring
   (C) Cleat wiring (D) Batter wiring

13. If at one end, the two wires made of different metals are joined together, then a voltage will get produced between the two wires due to difference of temperature between the two ends of wire. This effect is observed in
   (A) Thermocouples (B) Thermistors
   (C) RTD (D) Ultrasonic

14. The linear variable differential transformer transducer is a/an_____
   (A) Inductive transducer (B) Non-inductive transducer
   (C) Capacitive transducer (D) Resistive transducer

15. The temperature coefficient of thermistor transducer is
   (A) Negative (B) Positive
   (C) Zero (D) Unity

16. Photo conductive cell consists of a thin film of
   (A) Quartz (B) Lithium sulphate
   (C) Barium titanate (D) Selenium

17. According to Boolean law, A+1=_____
   (A) 1 (B) A
   (C) 0 (D) A′

18. A combination of AND function and NOT function results in
   (A) OR gate (B) Inversion
   (C) NAND gate (D) NOR gate

19. FM signal is better than AM signal because
   (A) Less immune to noise (B) Less adjacent channel interference
   (C) Amplitude limiters are used to avoid amplitude variations (D) All of the above

20. Phase locked loop can be used as
   (A) FM demodulator (B) AM demodulator
   (C) FM receiver (D) AM receiver

PART – B (5 × 4 = 20 Marks)
Answer **ANY FIVE** Questions

21. State Kirchoff's current and voltage law.

22. Define form factor and peak factor.

23. List the analogy between magnetic circuit and electric circuits.

24. Why the single phase induction motor is not self-starting?

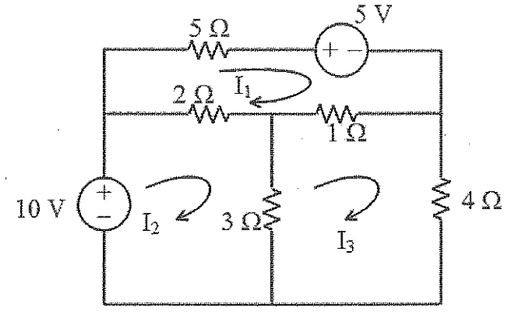
25. Explain the working of corridor wiring.

26. Define passive and active transducers with examples.

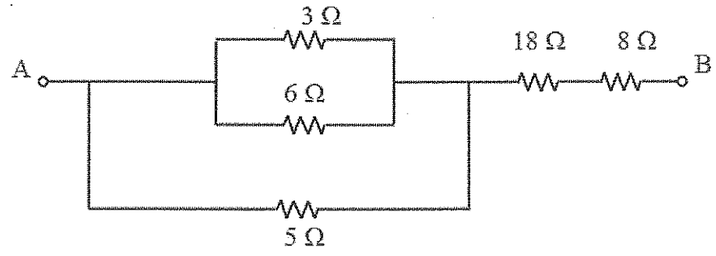
27. Convert $(28)_{10}$ into binary by actual division method.

PART – C (5 × 12 = 60 Marks)
Answer **ALL** Questions

28. a.i. Find the current through 5 Ω resistor using mesh method. (4 Marks)



ii. Calculate the effective resistance of the following combination of resistances and the voltage drop across each resistance when a potential difference of 60 V is applied between points A and B. (8 Marks)



(OR)