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**F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination:
March/April-2025**

**Basic Electrical & Electronics Engineering
(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) /
(BTECE0105)**

Day & Date: Wednesday, 04-June-2025
Time: 03:00 PM To 06:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks:14

Q.1 Choose the correct answer:

14

- 1) KVL is concerned with _____
 a) Junction voltages b) Junction currents
 c) IR drop & emfs d) Both a & b

- 2) A sinusoidal alternating current has a maximum value of I_m . Its average value will be _____
 a) I_m/π b) $I_m/2\pi$
 c) $2I_m/\pi$ d) None of these

- 3) The reluctance of a magnetic circuit is _____
 a) directly proportional to length and area
 b) directly proportional to length and inversely proportional to area
 c) directly proportional to area and inversely proportional to length
 d) none of these

- 4) The reluctance of the magnetic circuit is _____
 a) MMF/current b) MMF/flux
 c) flux/current d) flux/MMF

- 5) If alternating voltage is given by, $v = 230 \sin(314.16t)$, then the frequency is _____
 a) 60 Hz b) 50 Hz
 c) 40 Hz d) 200 Hz

- 6) The peak factor of sinusoidal quantity is _____
 a) 1.414 b) 1.57
 c) 1.11 d) 0.637

- 7) A DC motor converts _____
- a) Electrical energy into mechanical energy
 - b) Mechanical energy into electrical energy
 - c) Electrical energy into magnetic energy
 - d) Magnetic energy into electrical energy
- 8) PIV in full wave rectifier used in a centre tapped transformer is _____
- a) V_m/π
 - b) $2V_m/\pi$
 - c) $2 V_m$
 - d) V_m
- 9) Ideal diode in reverse bias offers _____ resistance and is equivalent to _____ switch.
- a) Zero, open
 - b) Zero, closed
 - c) Infinite, closed
 - d) Infinite, open
- 10) Transistor is operated as open switch in _____ region.
- a) Saturation
 - b) Cut-off
 - c) Active region
 - d) None of these
- 11) The base of transistor is _____
- a) Lightly doped
 - b) Moderately doped
 - c) Heavily doped
 - d) None
- 12) Octal equivalent of decimal number 375 is _____
- a) 560
 - b) 576
 - c) 565
 - d) 567
- 13) Which of the following gate cannot be used as inverter?
- a) XNOR
 - b) NOR
 - c) NAND
 - d) AND
- 14) The output of an AND gate is high when _____
- a) Any input is high
 - b) All inputs are high
 - c) No inputs are high
 - d) Both a and b

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**F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination:
March/April-2025**

**Basic Electrical & Electronics Engineering
(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) /
(BTECE0105)**

Day & Date: Wednesday, 04-June-2025
Time: 03:00 PM To 06:00 PM

Max. Marks: 56

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

- Q.2 Solve any four** **16**
- State and explain Ohm's law with its limitations.
 - Derive the expression for the division of current through three branches in parallel.
 - Explain series magnetic circuit with air-gap. Also derive the formula for total MMF.
 - Describe the working principle of single phase transformer with neat diagram.
 - Derive expression for purely inductive circuit. Draw phasor diagram.
 - A sinusoidal voltage is given by $v = 325.296 \sin(\omega t)$ volts at 50 Hz. Determine the RMS value, average value, angular frequency, time period of the voltage.
- Q.3 Solve any two** **12**
- Derive the equation for converting delta resistances into equivalent star resistances.
 - An iron ring with mean length 80 cm and cross-sectional area 10 cm^2 is uniformly wound with 500 turns of wire, determine the current required to set up a flux density of 12 Wb/m^2 in the ring. Also find the value of magnetic flux and magnetic field strength. Assume relative permeability of iron is 1000.
 - Explain series R-L-C circuit for the condition $X_c > X_L$, with voltage triangle, impedance triangle and phasor diagram.

Section – II

- Q.4 Solve any four.** **16**
- a) Explain VI characteristics of PN junction diode with neat diagram.
 - b) What is need of filter? Explain capacitor filter with neat diagram.
 - c) Explain working of BJT as switch.
 - d) Explain input and output characteristics of common emitter (CE) configuration of transistor.
 - e) State and prove distributive and commutative law.
 - f) Explain following logic gates with symbol, equation and truth table.
 - i) XOR ii) NAND iii) NOR iv) AND
- Q.5 Solve any two.** **12**
- a) Explain half wave rectifier with suitable diagram and derive expression for ripple factor and efficiency.
 - b) Compare different transistor configurations on the basis of input resistance, output resistance, voltage gain and current gain.
 - c) Perform following subtraction using 2's complement method. Show the result in octal form.
 - i) $(512)_8 - (345)_8$
 - ii) $(275)_8 - (155)_8$

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F.Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2024

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105)

Day & Date: Friday, 31-05-2024

Max. Marks: 70

Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicates full marks.

Section – I

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 07

Q.1 Choose the correct option from the following.

07

- 1) According to KCL algebraic sum of currents meeting at junction is _____.
a) Infinity
b) Minimum
c) Zero
d) None of the above
- 2) A sinusoidal alternating current has a maximum value of I_m . Its average value will be _____.
a) I_m/π
b) $I_m/2\pi$
c) $2I_m/\pi$
d) None of these
- 3) A absolute permeability of magnetic material is _____.
a) Φ/B
b) B/H
c) HB
d) $1/\mu_0 \mu_r$
- 4) The SI unit of reluctance is _____.
a) AT/M
b) AT/Wb
c) AT
d) N/Wb
- 5) If alternating voltage is given by, $v = 230 \sin (376.99t)$, then the frequency is _____.
a) 60Hz
b) 50 Hz
c) 40 Hz
d) 200Hz
- 6) The form factor of sinusoidal quantity is _____.
a) 1.11
b) 1.57
c) 1.414
d) 0.637
- 7) Frequency of an a.c. quantity is defined as _____.
a) number of cycles/sec
b) time/cycles
c) sec/revolution of magnetic energy
d) cycle/revolution

Section – II

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks:07

07

Q.1 Choose the correct alternatives from the given options.

- 8) Break down of PN junction occurs _____.
a) with forward bias
b) with reverse bias
c) because of manufacturing defect
d) None of these
- 9) The ripple factor decreases with _____.
a) Decrease in capacitance
b) Increase in frequency
c) Increase in capacitance
d) None of these
- 10) Transistor is operated as a closed switch in _____ region.
a) Saturation
b) Cut-off
c) Active region
d) None of these
- 11) In BJT, largest current flow occurs in the _____.
a) emitter
b) collector
c) base
d) All of these
- 12) The decimal number 17 is equal to binary number _____.
a) 10010
b) 11000
c) 10001
d) 01001
- 13) The output of an AND gate is high when _____.
a) Any input is high
b) All inputs are high
c) No inputs are high
d) Both (A) and (B)
- 14) The most suitable gate for comparing two bits is _____.
a) AND
b) OR
c) XOR
d) NAND

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F.Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2024
 Basic Electrical & Electronics Engineering #
 (BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105)

Day & Date: Friday, 31-05-2024
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

Instructions: 1) All questions are compulsory.
 2) Figures to the right indicates full marks.

Section – I

Q.2 Solve any Four

16

- State and Explain Kirchhoff's current and voltage law with suitable diagram.
- Derive the expression for the division of current through three branches in parallel.
- State and explain Faraday's laws of electromagnetic induction.
- Derive the emf equation of single phase transformer.
- Derive expression for purely capacitive circuit. Draw phasor diagram.
- For series R-L-C circuit the supply voltage $V_s = 100$ V, Voltage across resistance is 80 V. voltage across inductance is 150 V. What is the voltage across capacitor and power factor of a circuit? Assume $V_L > V_C$.

Q.3 Solve any Two

12

- Derive the equation for converting star resistances into equivalent delta resistances.
- A single-phase transformer has 350 primaries and 1050 secondary turns. The net cross sectional area of the core is 50 cm^2 . If the primary winding is connected to a 50 Hz supply at 400 V, calculate:
 - The maximum value of the flux density in the core, and
 - The voltage induced in the secondary winding.
- Explain series R-L-C circuit for the condition $X_L > X_C$, with voltage triangle, impedance triangle and phasor diagram.

Section – II

16

Q.2 Solve any Four.

- a) Draw circuit diagram and explain VI characteristics of PN junction diode.
- b) Explain Full wave center tap rectifier with necessary diagrams.
- c) Explain working of BJT as amplifier.
- d) Explain input and output characteristics of common base (CB) configuration of transistor.
- e) State and prove De-Morgan theorem.
- f) What is meant by universal gate? Derive basic gates using NAND and NOR gate.

Q.3 Solve any Two.

12

- a) Explain working of capacitor filter using full wave rectifier with neat circuit diagram.
- b) Compare different transistor configurations on the basis of input resistance, output resistance, voltage gain and current gain.
- c) Covert
 - i) $(AB.CD)_H$ to binary,
 - ii) $(132)_8$ to decimal.

Seat No.	
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Set **P**

F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2023
Basic Electrical & Electronics Engineering # (BTCE0105) /(BTCSE0105)/
(BTETE0105)/ (BTEE0105)/ (BTME0105)

Day & Date: Tuesday, 09-01-2024
 Time: 03:00 PM To 06:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
 3) Figures to the right indicates full marks.
 4) Assume suitable assumptions, if necessary.

Section - I

MCQ/Objective Type Questions

Marks: 07

Duration: 30 Minutes

Q.1 Choose the correct option from the following.

07

- 1) Two electric bulbs rated for the same voltage have power of 200w & 100w. if their resistances are respectively R_1 & R_2 then _____.
 - a) $R_1 = 2R_2$
 - b) $R_2 = 2R_1$
 - c) $R_2 = 4R_1$
 - d) $R_2 = R_1$
- 2) The equivalent resistance of n resistances connected in parallel is equal to _____.
 - a) Higher than higher value
 - b) equal to smallest value
 - c) less than smallest value
 - d) Higher than smallest value
- 3) Three identical resistors are connected first in parallel and then in series. The resultant resistance of the second combination to the first will be _____.
 - a) 1/9
 - b) 9
 - c) 1/6
 - d) None of these
- 4) The reluctance of the magnetic circuit is _____.
 - a) Φ/Nl
 - b) Nl/Φ
 - c) Φ/l
 - d) Nl/Φ
- 5) The direction of induced e.m.f. can be found with the help of _____.
 - a) Fleming's right-hand rule
 - b) Kirchhoff's voltage law
 - c) Right hand gripping rule
 - d) Lenz's law
- 6) The form factor of a sinusoidal wave is _____.
 - a) 1.414
 - b) 2
 - c) 1.11
 - d) 1.5
- 7) A series a.c. circuit has $R = 4 \Omega$ and $X_L = 3 \Omega$. It will be expressed in the rectangular form as _____.
 - a) $(-4 - j3)$
 - b) $(-4 + j3)$
 - c) $(4 + j3)$
 - d) $(4 - j3)$

Section - II

MCQ/Objective Type Questions

Marks:07

Duration: 30 Minutes

07

Q.1 Choose the correct alternatives from the given options.

- 1) A pn junction acts as a _____.
 - a) controlled switch
 - b) bidirectional switch
 - c) unidirectional switch
 - d) none of the above
- 2) PIV of diode used in full wave center tap rectifier is _____.
 - a) V_m/π
 - b) $2V_m/\pi$
 - c) $2V_m$
 - d) V_m
- 3) Ripple factor of full wave rectifier without filter is _____.
 - a) 0.2
 - b) 1.21
 - c) 0.48
 - d) 0.24
- 4) The element that has biggest size in a transistor is _____.
 - a) collector
 - b) emitter
 - c) base
 - d) none of these
- 5) The value of α of α transistor is _____.
 - a) more than 1
 - b) less than 1
 - c) 1
 - d) none of the above
- 6) The output of AND gate is HIGH when _____.
 - a) Any input is high
 - b) all inputs are high
 - c) no inputs are high
 - d) Both a and b
- 7) The hexadecimal no. $(19A.A1)_{16}$ is equivalent to octal no. _____.
 - a) $(632.502)_8$
 - b) $(632.512)_8$
 - c) $(632.521)_8$
 - d) $(632.520)_8$

SLR-GF-705

Set **P**

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F.Y. (B.Tech.) (Sem - I) (New) (CBCS) Examination: Oct/Nov-2023
Basic Electrical & Electronics Engineering # (BTCE0105) / (BTCSE0105) /
(BTETE0105) / (BTEE0105) / (BTME0105)

Max. Marks: 56

Day & Date: Tuesday, 09-01-2024
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume suitable assumptions, if necessary.

Section - I

16

Q.2 Attempt any FOUR of the following.

- Three resistors are connected in series across 12 V batteries. The first resistor has a value of 1Ω , second has a voltage drop of 4 volt and third has power dissipation of 12 watts. Calculate the value of circuit current.
- State and Explain Kirchhoff's voltage and current laws. Give suitable illustration.
- Explain Faraday's Laws of electromagnetic induction and Lenz's law.
- The maximum in the core of 250 /2800 volts, 50 (Hz) single phase transformer is $1.2 \text{ (wb/m}^2\text{)}$. If the emf per is 9 (v). Determine
 - N_1 and N_2
 - Area of the core
- State and prove that the RMS value of sinusoidal alternating current is 0.707 times the peak value.
- An a.c. voltage wave is express as $e = 300 \sin (314t)$
Find the peak voltage, frequency, RMS voltage & instantaneous voltage at $t = 1/600 \text{ sec}$.

12

Q.3 Attempt any TWO of the following.

- Describe the importance of delta-star transformation. If three resistances are connected in delta-connection, then find the equivalent values of these resistances for star-connections.
- A core forms a closed magnetic loop path length 32 cm. Half of this path has a cross sectional area of 2 cm^2 and relative permeability 800. The other half has a cross sectional area 4 cm^2 and relative permeability 400. Find the current needed to produce a flux of 0.4 Wb in the core if it is wound with 1000 turns of insulated wire. Ignore leakage and fringing effects.
- A 230 V, 50 Hz a.c. supply is applied to a coil of 0.06 H inductance and 2.5Ω resistance connected in series with a $6.8 \mu\text{F}$ capacitor.
Calculate: -

- impedance
- current
- phase angle between current and voltage
- power factor
- Active power
- reactive power

Section – II

Q.2 Attempt any FOUR of the following.

16

- a) Explain biasing of PN junction diode.
- b) Explain the working of Half wave rectifier with neat circuit diagram.
- c) Explain application of transistor as a switch with neat diagram.
- d) Draw and explain symbol, equation and truth table of all basic logic gates.
- e) Covert $(DBC)_H$ to decimal and octal.
- f) Perform subtraction using 2's complement and convert in to octal $(1667)_8 - (341)_8$

Q.3 Attempt any TWO of the following.

12

- a) Explain CB transistor configuration with its input and output characteristics. Also draw the necessary diagram.
- b) Why filters are required? Draw the circuit diagram of full wave rectifier using two diodes and capacitor filter. Also explain its working and draw necessary waveforms.
- c) What is meant by universal gate? Derive basic gates using NOR gate.

F.Y. (B.Tech.) (Sem-II) (CBCS) Examination: March/April-2023
Basic Electrical & Electronics Engineering (BTN10204)

Time: 10:00 AM To 01:00 PM

- 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
- 3) Figures to the right indicates full marks.
- 4) Assume suitable data if necessary.

Marks: 14

14

- 1) Kirchhoff's voltage law is concerned with _____.
a) IR drops
b) battery emf
c) junction voltage
d) both a and b
- 2) Ideal voltage source having internal resistance _____.
a) Infinity
b) zero
c) less
d) more
- 3) The reluctance of the magnetic circuit is _____.
a) NI/I
b) Φ/Nl
c) NI/Φ
d) Φ/I
- 4) Inductance of coil $L =$ _____.
a) $N\Phi/I$
b) $N\Phi$
c) $I\Phi$
d) $\Phi^2 N$
- 5) A sinusoidal alternating current has a maximum value of I_m . Its average value will be _____.
a) I_m/π
b) $I_m/2\pi$
c) $2I_m/\pi$
d) None of these
- 6) The R.M.S. value of sinusoidal A.C. current is equal to its instantaneous value at an angle in degree _____.
a) 60°
b) 45°
c) 30°
d) 90°
- 7) In a star connected system, the relation between the line voltage V_L and phase voltage V_{ph} is _____.
a) $V_L = V_{ph}$
b) $V_L = V_{ph}/\sqrt{3}$
c) $V_L = \sqrt{3}V_{ph}$
d) None of these
- 8) Zener diode can be used for _____.
a) amplification
b) regulation
c) rectification
d) switching

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SLR-WF-496

Set **P**

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F.Y. (B.Tech.) (Sem-II) (CBCS) Examination: March/April-2023
Basic Electrical & Electronics Engineering (BTN10204)

Max. Marks: 56

Day & Date: Friday, 21-07-2023

Time: 10:00 AM To 01:00 PM

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

16

Q.2 Solve any FOUR.

1-35
25 Marks

- State and Explain Kirchhoff's voltage and current laws. Give suitable illustration.
- Three parallel connected resistors when connected a d.c. voltage sources dissipate a total power of 72 W. the total current is 6A, the current flowing through the first resistor is 3A and the second and third resistors have equal value. What is the resistance of the three resistors?
- Compare electric circuit and magnetic circuit with their similarities and dissimilarities.
- Explain and derive an expression for average and RMS values of an alternating quantity.
- Define the terms:
 - Instantaneous value
 - Average value
 - RMS value
 - Frequency
- 400 V (line Voltage) is applied to three phase balanced star connected load of impedance $Z = (4 + j3) \Omega/\text{phase}$.
 - Phase voltage
 - line current

12

Q.3 Solve any TWO

- Describe the importance of delta -star transformation. If three resistances R_A , R_B , R_C , are connected in delta -connection, then find the equivalent values of these resistances for star -connections.
- A core forms a closed magnetic loop path length 32 cm. Half of this path has a cross sectional area of 2 cm^2 and relative permeability 800. The other half has a cross sectional area 4 cm^2 and relative permeability 400. Find the current needed to produce a flux of 0.4 Wb in the core if it is wound with 1000 turns of insulated wire. Ignore leakage and fringing effects.
- Explain series R-L-C ac circuit for condition $X_C > X_L$, with voltage triangle, impedance triangle and phasor diagram.

Section – II

Q.4 Solve any FOUR.

16

- a) Explain working of BJT as amplifier.
- b) Explain half wave rectifier with necessary diagrams
- c) Convert $(BC)_H$ to decimal and binary.
- d) What is meant by universal gate? Derive basic gates using NAND and NOR gate.
- e) Explain a working and application of LVDT.
- f) What is need of filter? Explain capacitor filter.

Q.5 Solve any TWO.

12

- a) Explain bonded and unbounded strain gauge with diagram.
- b) Explain construction and operation of light emitting diode. Write applications of it and explain any one in detail.
- c) Prove the Following Expressions.
 - 1) $A + AB = A$
 - 2) $(A + B)(A + C) = A + BC$

F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022
Basic Electrical & Electronics Engineering

Max. Marks: 70

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed and mention it clearly.

Marks: 14

14

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- 10) The collector of transistor is _____ doped.
a) Lightly b) Heavily
c) Moderately d) None
- 11) In transistor _____.
a) $I_c = I_E + I_B$ b) $I_B = I_c + I_E$
c) $I_E = I_c - I_B$ d) $I_E = I_c + I_B$
- 12) The gauge factor is defined as
a) $(\Delta L/L) / (\Delta R/R)$ b) $(\Delta R/R) / (\Delta L/L)$
c) $(\Delta R/R) / (\Delta D/D)$ d) $(\Delta R/R) / (\Delta \sigma/\sigma)$
- 13) What is moving part of LVDT
a) Primary b) Secondary
c) Diaphragm d) Core
- 14) 1's complement of $(10111010)_2$ is
a) $(01000101)_2$ b) $(11111)_2$
c) $(010001)_2$ d) $(1111)_2$.

Seat
No.Set **P**

F.Y (B. Tech) (Sem-II) (CBCS) Examination: Oct/Nov-2022
Basic Electrical & Electronics Engineering

Max. Marks: 56

Day & Date: Wednesday, 08-03-2023
 Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
 2) Section I and Section II are compulsory.

Section – I**16****Q.2 Solve any four.**

- Define resistance and discuss the factors on which resistance of conductor material depends.
- Two coils connected in series have a resistance of 18Ω and when connected in parallel have a resistance of 4Ω . Find the value of resistances.
- Explain the term (i) mmf, (ii) Flux, (iii) Permeability, (iv) Reluctance.
- Define and derive expression for average value for sinusoidal current in terms of its maximum value.
- Derive expression for purely capacity circuit. Explain concept of capacitive reactance.
- Derive the relationship between line and phases qualities in balanced star connected 3 - phase load.

12**Q.3 Solve any two.**

- Describe the importance of delta - star transformation. If three resistances are connected in delta - connection, then find the equivalent values of these resistances for star - connections.
- A coil of resistance 10Ω and an inductance of $0.2H$ is connected in series with a capacitor of $50.7\mu F$. The circuit is connected across a $100V$, $50Hz$, single phase supply. Find i) the current flowing ii) the voltage across capacitors iii) the voltage across the coil iv) power factor of the coil. Draw the phasor diagram.
- A flux density of $1.3T$ is required in $3.5mm$ air gap of an electromagnet wound with 550 turns of wire and having an iron path of $130cm$. calculate the current required assuming that a relative permeability of 1200 for iron and neglecting the leakage and fringing.

Section II**16****Q.4 Solve any four.**

- Explain working of BJT as switch.
- Explain Full wave rectifier with necessary diagrams.
- Convert (DBD) H to decimal and octal.
- What is meant by universal gate? Derive basic gates using NAND and NOR gate.
- Explain thermocouple for the measurement of temp. In detail.
- Explain VI characteristics of PN junction diode.

SLR-HL-407

Set **P**

12

Q.5 Solve any two

- a) Explain the following transducer: 1) Thermocouple 2) Load Cell
- b) Explain construction and operation of light emitting diode. Write applications of it and explain any one in detail.
- c) Explain with symbol, equation, truth table following logic gates.
a) XOR b) NAND c) NOR d) NOT e) AND

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- 9) To display the light 8 in a seven-segment indicator _____.
a) C must be lighted
b) G must be off
c) F must be on
d) All segments must be lighted
- 10) $I_C = \beta I_B + \underline{\hspace{1cm}}$.
a) ICBO
b) IC
c) ICEO
d) αI_E
- 11) The base of transistor is _____.
a) lightly doped
b) Moderately doped
c) Heavily doped
d) None of these
- 12) Thermocouple is a _____ transducer and used for measurement of _____.
a) passive, temperature
b) active, light intensity
c) active, displacement
d) active, temperature
- 13) $(\overline{A.B}) = \underline{\hspace{1cm}}$.
a) $\overline{A} + \overline{B}$
b) $\overline{A} - \overline{B}$
c) $\overline{A} . \overline{B}$
d) None of the above
- 14) The binary no. $(10101100110.01011)_2$ is equivalent to octal no.
a) $(2546.26)_8$
b) $(2546.62)_8$
c) $(2645.26)_8$
d) $(2456.26)_8$

SLR-JE-721

Seat
No.Set **P**

F.Y. (B.Tech.) (Sem-II) (Old) (CBCS) Examination: March/April-2024
Basic Electrical & Electronics Engineering (BTN10204)

Day & Date: Friday, 31-05-2024
 Time: 10:00 AM To 01:00 PM

Max. Marks: 56

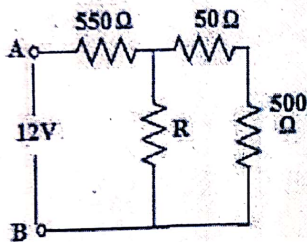
- Instructions:** 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

Section – I

16

Q.2 Solve any FOUR.

- a) State and Explain Kirchhoff's voltage and current laws. Give suitable illustration.
 b) What is the value of unknown resistor R in fig. if the voltage drop across $500\ \Omega$ resistor is 2.5 V? All resistors are in Ω .

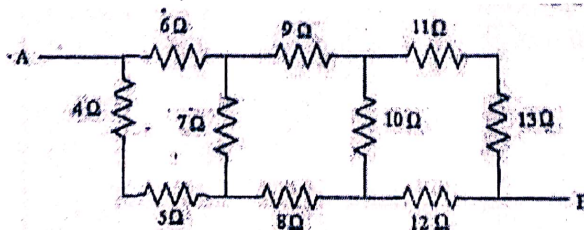


- c) Define and explain following terms:
 i) Magnetic Flux
 ii) Flux Density
 iii) Magnetic field strength
 iv) Reluctance
 d) Define RMS value. Prove that the RMS value of sinusoidal alternating current is 0.707 times the peak value.
 e) A coil having a resistance of $10\ \Omega$ and inductance of 0.2 H is connected to a 100 V, 50 Hz 1 ph A.C supply. Calculate:-
 i) Impedance of the coil
 ii) Reactance of coil
 iii) Current taken
 iv) Phase difference between current and applied voltage.
 f) Derive the relationship between line and phase quantities in balanced star connected 3-phase load.

Q.3 Solve any TWO

12

- a) Calculate the equivalent resistance between A and B for the following circuit.



- b) Define single phase Derive the induced emf equation for a single phase transformer. Write emf equation in terms B_m .
- c) Explain series R-L-C ac circuit for condition $X_L > X_C$, with voltage triangle, impedance triangle, phasor diagram and power factor.

Section – II**Q.4 Solve any FOUR.**

16

- a) Explain the operation of full wave rectifier with center tap transformer. Draw input and output waveforms.
- b) Compare common base, common emitter and common collector configuration of transistor amplifier.
- c) Explain in detail Linear variable differential transformer as transducer.
- d) Explain working of Bipolar Junction Transistor as an amplifier.
- e) Explain all basic gates with the help of symbol, equation and truth table.
- f) What is transducer? What are the types of transducer? Explain with suitable example.

Q.5 Solve any TWO.

12

- a) Explain the operation of Zener diode as a voltage regulator circuit.
- b) 1) Convert $(A97.B8)_{16}$ to decimal, and octal.
2) Perform the subtraction using 2's compliment $(175)_8 - (100)_8$
3) Convert the decimal number to hex
i) $(180.125)_{10}$
ii) $(956)_{10}$
- c) What is meant by universal gate? Derive basic gates using NOR gate.

Seat No.	
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Set **P**

F.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2024
Basic Electrical & Electronics Engineering
(BTCE0205/ BTME0205/ BTETE0205/ BTCSE0205/ BTEE0205)

Day & Date: Friday, 31-05-2024
 Time: 10:00 AM To 01:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
 3) Figures to the right indicates full marks.

Section - I

MCQ/Objective Type Questions

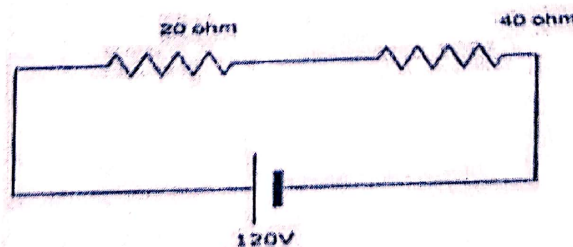
Duration: 30 Minutes

Marks: 07

Q.1 Choose the correct option from the following.

07

- 1) The algebraic sign of an IR drop is primarily dependent upon the _____.
 - a) amount of current flowing through it
 - b) value of R
 - c) direction of current flow
 - d) battery connection
- 2) What is responsible for the current to flow?
 - a) Protons
 - b) Electrons
 - c) Nucleus
 - d) Protons and Electrons
- 3) Which of the following according to KCL must be zero?
 - a) Algebraic sum of currents in closed-loop
 - b) Algebraic sum of power in closed-loop
 - c) Algebraic sum of currents entering and leaving a junction
 - d) Algebraic sum of voltages across the input and output
- 4) Find the current in the circuit.



- a) 1 A
 - b) 2 A
 - c) 3 A
 - d) 4 A
- 5) There is 900 mA of current through a wire with 40 turns. What is the reluctance of the circuit if the flux is 400Wb?
 - a) 14,400 At/Wb
 - b) 1,440 At/Wb
 - c) 9,000 At/Wb
 - d) 90,000 At/Wb

- 6) Which of the following is not an expression power?
- | | |
|----------------|----------------|
| a) $P = VI$ | b) $P = I^2 R$ |
| c) $P = V^2/R$ | d) $P = I/R$ |
- 7) Power factor of the following circuit will be zero _____.
- | | |
|----------------|---------------------|
| a) Resistance | b) inductance |
| c) Capacitance | d) both (b) and (c) |

Section - II

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 07

07

Q.1 Choose the correct option from the following.

- 1) Addition of pentavalent impurity to a semiconductor creates many _____.
 - a) free electrons
 - b) holes
 - c) valence electrons
 - d) bound electrons
- 2) The forward voltage drop across the germanium diode is about _____.
 - a) 2.5 V
 - b) 0.3 V
 - c) 10 V
 - d) 0.7 V
- 3) Rectification efficiency of full-wave rectifier will be _____.
 - a) 81.2%
 - b) 40.6%
 - c) 48%
 - d) 78.5%
- 4) The base of transistor is _____doped.
 - a) Heavily
 - b) moderately
 - c) lightly
 - d) none of above
- 5) A transistor connected in common collector configuration has _____.
 - a) high input and low output resistance
 - b) low input and high output resistance
 - c) low input and low output resistance
 - d) high input and high output resistance
- 6) The decimal no. $(37)_{10}$ is equivalent to binary no. _____.
 - a) $(11000)_2$
 - b) $(10100)_2$
 - c) $(100101)_2$
 - d) $(11001)_2$
- 7) In Boolean algebra $A(A + B) =$
 - a) A
 - b) B
 - c) AB
 - d) $A + B$

SLR-JE-716

Set **P**

Seat No.

F.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2024
Basic Electrical & Electronics Engineering
(BTCE0205/ BTME0205/ BTETE0205/ BTCSE0205/ BTEE0205)

Max. Marks: 56

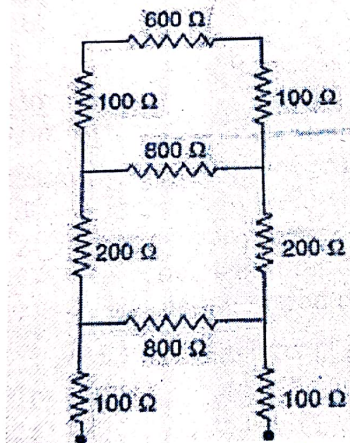
Day & Date: Friday, 31-05-2024
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
3) Figures to the right indicates full marks.

Section – I

Q.2 Solve any FOUR.

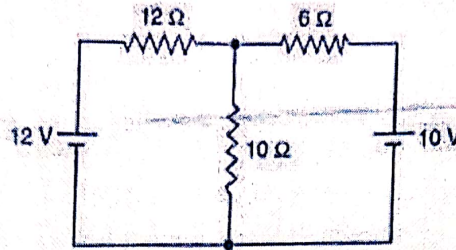
- a) Drive the equation for converting delta-star transformation.
b) What is the equivalent resistance of the network shown in Fig.



- c) Draw and explain the concept of leakage and fringing in magnetic circuit.
d) Define and derive expression for RMS value of sinusoidal alternating quantity.
e) A coil takes 2.5 amps, when connected across 200 volts 50 Hz mains. The power consumed by the coil is found to be 400 watts. Find the inductance and the power factor of the coil. ✓
f) Define the following terms:
i) MMF
ii) Reluctance
iii) Absolute and
iv) relative permeabilities

Q.3 Solve any TWO.

- a) In the circuit of Fig., find the current through each resistor and voltage drop across each resistor.



- b) Explain in details of emf equation for single phase transformer. Write equation for transformation ratio.
- c) A resistance $12\ \Omega$, an inductance of $0.15\ H$ and a capacitance of $100\ \mu F$ are connected in series across a $100\ V$, $50\ Hz$ supply. Calculate:
- The current
 - The phase difference between current and the supply voltage
 - Power consumed

RLC AC ckt.

SLR-JE-716

Set **P**

Section – II

Q.4 Solve any FOUR.

- a) Draw and Explain forward and reverse biasing of PN Junction diode.
- b) What is need of filter? Explain capacitor filter.
- c) Derive the relation between α and β gain of transistor.
- d) i) Convert $(AF9.C)_{16}$ to decimal and octal
ii) Perform the subtraction using 2's compliment $(1766)_8 - (23)_8$
- e) Draw and explain basic gates with symbol.....

16

Q.5 Solve any TWO.

- a) What is meant by universal gate? Derive basic gates using NAND gate.
- b) Draw and explain input-output characteristics for CE configuration.
- c) Explain the operation of center tap full wave rectifier with help of neat circuit diagram & waveform.

12

Seat No.	
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Set	P
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F.Y. (B.Tech.) (Sem-II) (CBCS) Examination: Oct/Nov-2023
Basic Electrical & Electronics Engineering (BTN10204)

Day & Date: Thursday, 28-12-2023
 Time: 03:00 PM To 06:00 PM

Max. Marks: 70

- Instructions:** 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
 2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
 3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes

Marks: 14

Q.1 Choose the correct option from the following.

14

- 1) When two resistance are in parallel equivalent resistance is _____.
 a) $R = (R_1 R_2) / (R_1 + R_2)$ b) $R = (R_1 + R_2) / (R_1 R_2)$
 c) $R = R_1 / (R_1 + R_2)$ d) $R = R_2 / (R_1 + R_2)$
- 2) Three 2 ohm resistors are connected to form a triangle. The resistance between any two corners is _____.
 a) 6 Ω b) 2 Ω
 c) 3/4 Ω (0.75) d) 4/3 Ω (1.33)
- 3) Flux density $B = ?$
 a) $\mu_0 \mu_r / H$ b) $\mu_0 H / \mu_r$
 c) $\mu_0 \mu_r H$ d) $(\mu_0)^2 H$
- 4) A transformer having, 1000 primary turns is connected to a 250 V a.c supply. For a secondary voltage of 400V, the number of turns should be _____.
 a) 1600 b) 250
 c) 400 d) 1250
- 5) A series a.c circuit has $R = 4\Omega$ and $X_L = 2\Omega$. It will be expressed in the rectangular form as _____.
 a) $(-4 - j2)$ b) $(-4 + j2)$
 c) $(4 + j2)$ d) $(4 - j2)$
- 6) In an R-L series circuit $R = 10\Omega$ and $X_L = 10\Omega$. The phase angle between applied voltage and circuit is _____.
 a) 45° b) 20°
 c) 60° d) 26.8°
- 7) The power taken by a 3 - ϕ load is given by the expression _____.
 a) $3V_L I_L \cos \phi$ b) $\sqrt{3}V_L I_L \cos \phi$
 c) $3V_L I_L \sin \phi$ d) $\sqrt{3}V_L I_L \sin \phi$
- 8) An N-type semiconductor is _____.
 a) positively charged b) negatively charged
 c) electrically neutral d) none of these

Seat No.	
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F.Y. (B.Tech.) (Sem-II) (CBCS) Examination: Oct/Nov-2023
Basic Electrical & Electronics Engineering (BTN10204)

Day & Date: Thursday, 28-12-2023
 Time: 03:00 PM To 06:00 PM

Max. Marks: 56

- Instructions:** 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any FOUR.

16

- Define resistance and discuss the factors on which resistance of conductor material it depends.
- ✓ Three resistors are connected in series across 12 V batteries. The first resistor has a value of 1Ω , second has a voltage drop of 4 volt and third has power dissipation of 12 watts. Calculate the value of circuit current.
- c) Discuss in detail the similarities and dissimilarities between electrical circuit and magnetic circuit.
- d) Explain principle of operation, working and construction of single phase transformer.
- e) Define and derive expression for average value for sinusoidal current.
- f) X Three impedances, each of resistance 12Ω and inductive reactance 5Ω are connected in star across a 3-phase 440 V, 50 Hz supply. Find the line current and the total power consumed in the circuit.

Q.3 Solve any TWO

12

- a) Describe the importance of delta -star transformation. Derive the equations for converting delta resistances into equivalent star resistances.
- b) A coil of 500 turns and resistance of 20 ohms is wound uniformly on an iron ring of mean circumference 50 cm and cross sectional area 4 cm^2 . It is connected to 24V DC supply & relative permeability of material is 800. Find
 - 1) MMF
 - 2) magnetic field strength
 - 3) total flux
 - 4) reluctance
- c) A resistance of 1Ω an inductive of 1H and a capacitance of $1\mu F$ are connected in series across 230 V, 50 Hz supply. Calculate:-
 - 1) total impedance
 - 2) current
 - 3) power factor and its nature and
 - 4) Active Power
 - 5) Reactive power
 - 6) Apparent power

RLC AC CK

Section – II

Q.4 Solve any FOUR.

16

- a) Explain the operation of Half wave rectifier. Draw input and output waveforms.
- b) Draw and explain input and output characteristics of common emitter transistor.
- c) Explain strain gauge as a transducer with its types. What is gauge factor?
- d) Explain working of Bipolar Junction Transistor as a switch.
- e) Perform subtraction using 2's complement and convert the result into Octal:
 $(123)_8 - (50)_8$
- f) What is electrical transducer? Give various factors for selection of transducer.

Q.5 Solve any TWO.

12

- a) Why filters are required? Draw the circuit diagram of full wave rectifier using two diodes and capacitor filter. Also explain its working and draw necessary waveforms.
- b) Prove the Following Boolean expressions.
 - 1) $A+AB=A$
 - 2) $(A+B)(A+C)=A+BC$
 - 3) $(A+B)(A+B)(A+C)=A+BC$
- c) What is meant by universal gate? Derive basic gates using NAND gate.