

INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY
BARGARH/GUWAHATI/FULIA/JODUPUR/SALEM/VARANASI/CHAMP'A/KANNUR/KHITI GADAG/SPKM VENKATAGIRI
SEMESTER DIPLOMA EXAMINATION – NOV./DEC.-2017
DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY, ACADEMIC YEAR 2017-18

Semester: I Semester

Time: 3 Hours

Subject Code & Name: 1.3 APPLIED PHYSICS (2011 – REGULATION) Max.marks:80

- Note:**
1. Answer all question of PART – A and of PART – B
 2. Assume standard values of physical constants where ever necessary

PART-A

- Q.**
1. What is unit of Power in MKS System?
 2. Write down the dimensional formula of Distance.
 3. Convert 100°C into Kelvin scale.
 4. Define Coefficient of Linear thermal expansion.
 5. Defined purpose of simple Microscope.
 6. Defined amplitude.
 7. Which type of charge is found on Protons?
 8. Give the circuit diagram for 02 nos. of capacitors are connected in series.
 9. Give one example of Trivalent impurity.
 10. Nos. of p-n junction in semi conductor diode.

2 x 10 = 20

PART-B

- Q.11**
- A. Write down limitations of dimensions. 04
- B. Prove that $s = ut + \frac{1}{2}at^2$ is dimensionally correct. 08

OR

- C. Write down the name of two derived physical quantities and their units. 04
- D. Convert 9.8 mtrs/sec^2 into cm/sec^2 with the help of dimensions. 08

- Q.12**
- A. State Charle's law. 04
- B. Volume of given mass of gas is 20 cc at a pressure of 76 cm of Hg. Calculate it's volume if pressure get reduced to half

OR

C. Establish the relation between coefficient of linear thermal expansion and coefficient of superficial thermal expansion 04

D. Length of rod is increased by 0.2% if it's temperature is increased by 100°C . Find out coefficient linear thermal expansion of rod material. 08

Q.13 A. Write down condition for total internal reflection 04

B. Derive formula for Refractive index of prism 08

OR

C. Defined Free, Damped & Forced vibration 04

D. A broad casting station emitting radio waves of velocity 3×10^8 m/sec. Calculate the wave length of emitted wave if frequency is 3000 KHz 08

Q.14 A. Find out the equivalent resistance when nos. of resistances is connected in parallel 04

B. Three capacitors each of 1 μF connected in series, find out the equivalent capacitance of the system 08

OR

C. Find out equivalent capacitance when nos. of capacitors is connected in parallel 04

D. Two resistances each of 1 Ω are connected in series and combination is then connected in parallel with single resistance of 2 Ω , then find out equivalent resistance of system. 08

Q.15 A. Describe Conductor, Insulator and Semiconductor 04.

B. Describe functioning of full wave center tap rectifier with neat diagram. 08

OR

C. Describe working of N-type semiconductor with neat diagram 04

D. Defined logic gate? Describe NOT gate with truth table 08

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BARGARH/GUWAHATI/FULLIA/JODHPUR/SALEM/VARANASI/CHAMPA/KANNUR/KHITI GADAG/SPKM VENKATAGIRI
SEMESTER/ANNUAL DIPLOMA EXAMINATION – NOV./DEC.-2017

OF
DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY, ACADEMIC YEAR 2017-18

Semester: First Year

Time: 3 Hours

Subject Code & Name: 1.3 APPLIED PHYSICS (2014 – REGULATION) Max.marks:80

- Note:**
1. Answer all question of PART – A and of PART – B
 2. Assume standard values of physical constants where ever necessary

PART-A

- Q.**
1. What is unit of Work in MKS System?
 2. Write down the dimensional formula of Acceleration.
 3. Convert 273° K into Centigrade scale.
 4. Define Pressure coefficient of gas.
 5. Which type of lens is used in simple Microscope?
 6. Give one example of Longitudinal wave motion.
 7. Write down nature and amount of charge on electron.
 8. Give the circuit diagram when 02 nos. of capacitors are connected in parallel.
 9. Which type of impurity is added to pure semiconductor to form P-Type semiconductor?
 10. What is meant by intrinsic semiconductors?

2 x 10 = 20

PART-B

- Q.11**
- A. Write down the uses of dimensions. 04
- B. Prove that $v^2 = u^2 + 2as$ is dimensionally correct. 08
- OR**
- C. Write down the name of fundamental physical quantities and their units in MKS System. 04
- D. Convert 1 Joule of work into ergs with the help of dimensions. 08
- Q.12**
- A. State Boyle's law with neat diagram 04
- B. Volume of given mass of gas is 40 cc at a pressure of 400 cm of Hg. Find the volume of same mass of gas when it's pressure is increased to double.

OR

- C. State Charl's law with neat diagram. 04
- D. A mass of nitrogen occupies 400 cc at 20° C under pressure of 76 cm of Hg. Find its volume at 200° C where its pressure is being same. 08

- Q.13** A. Describe constructional feature and working of simple microscope with neat diagram. 04
- B. Describe total internal reflection with neat diagram and also give condition for total internal reflection. 08

OR

- C. Define Longitudinal wave motion & Transverse wave motion with example. 04
- D. A radio station emitting waves of wave length 300 meters and the velocity of waves are 3×10^8 m/sec. Calculate the frequency of the emitted waves. 08

- Q.14** A. Find out the equivalent resistance when nos. of resistances is connected in series 04
- B. Three capacitors each of 1 μ F connected in parallel, find out the equivalent capacitance of the system 08

OR

- C. Find out equivalent capacitance when nos. of capacitors is connected in series. 04
- D. Three resistances each of 3 Ω are connected in parallel find out equivalent resistance of system. 08

- Q.15** A. Describe P-type semiconductor with neat diagram of its bonding structure. 04.
- B. Describe functioning of half wave rectifier with neat diagram. 08

OR

- C. Describe working of P-N-P transistor with neat diagram 04
- D. Define logic gate? Describe NOT gate with truth table 08

DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY
FIRST SEMESTER (BACK PAPER) EXAMINATION – NOV/DEC-2015

1.3 – APPLIED PHYSICS

TIME: 3 HOURS

MAX. MARKS : 80

PART - A



Answer all the questions within two or three sentences:

(2X10=20)

- I. i. What are fundamental physical quantities?
- ii. Name any two physical quantities having the same dimensional formula.
- iii. Define: Pressure coefficient of a gas.
- iv. State Boyle's law.
- v. Define: critical angle.
- vi. Define: wave length.
- vii. Give the units of Resistance and conductance.
- viii. Explain dopiy.
- ix. What type of bond is present in semiconductors?
- x. Write the symbol of a PNP Transistor and mark the terminals.

PART - A

Answer all questions in detail:

- II. a. Give the dimensional formula for Force, Energy, Frequency and Acceleration. (04)
- b. Prove that $V=u+at$ is dimensionally correct. (08)

OR

- c. Define unit. Write any two uses of dimensional formula. (04)
- d. Prove that $V^2 = u^2 + 2as$ is dimensionally correct. (08)

- III. a. State Charle's law with help of diagram. (04)
- b. The volume of gas 210cc of a temperature of 27°C . Find its volume if temperature is increased to 127°C at constant pressure. (08)

OR

- c. Is the temperature – 310K attainable? Give the reason. (04)
- d. The initial temperature 4 times raises to its original temperature at constant pressure its volume is 4cc. Find it's final volume. (08)

- IV. a. Define Resonance. Give any one example for Resonance. (04)
b. Find the refractive index of an equilateral glass prism having an angle of minimum deviation 60° . (08)

OR

- c. Explain total internal reflection. (04)
d. The velocity of sound wave in water is 1200ms^{-1} , find the frequency of sound wave in water having a wave length of 6m. (08)

- V. a. State and explain Coulomb's law in electrostatics. (04)
b. 3 resistors of resistance 10 ohms, 50 ohms and 45 ohms are connected in series. Calculate the equivalent resistance. (08)

OR

- c. Describe the equation for equivalent capacitance when the capacitors are connected in parallel. (04)
d. A current of 2mA flows through a conductor when its ends are at potential difference of 5V. Find the resistance of the conductor. (08)

- VI. a. Explain P-type semiconductor. (04)
b. Explain the working of a half wave Rectifier with a neat circuit diagram. (08)

OR

- c. Explain the working of a diode in the forward bias condition. (04)
d. What is a logic gate? Give the symbol, logical expression and truth table of basic gates "AND" & "OR" gates. (08)



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DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY
1 YEAR (BACK PAPER) EXAMINATION – NOV/DEC-2015

1.3 APPLIED PHYSICS

Time: 3 hours

Max. Marks 80

PART-A



10x2=20

I. Answer the following in one or two sentences:

- i. Give the dimensional formula for "Force" and "Energy".
- ii. What are the two supplementary quantities in SI system?
- iii. State Boyle's law.
- iv. Write the formula for perfect gas equation.
- v. Define: Critical angle.
- vi. Explain Free vibrations.
- vii. Give the units of resistance and conductance.
- viii. Define Ohm's law.
- ix. Draw the circuit of forward bias.
- x. What type of impurity is added to pure silicon to get N-type semi conductor?

PART-B

Answer the following questions in detail.

- II. a. Distinguish between Fundamental physical quantity and Derive physical quantity, with suitable example for each. (04)
- b. Prove that $S = ut + \frac{1}{2} at^2$ is dimensionally correct. (08)
- OR
- a. What are the limitations and uses of dimensional formula? (04)
- b. Prove by dimensional method 1 Joule = 10^7 ergs. (08)
- III. a. Explain Kelvin scale of temperature. (04)
- b. A certain volume of gas at 30° is heated at constant pressure, so that volume becomes 3 times the original volume. Calculate the final temperature. (08)
- OR
- c. State Charle's 1st law and Charle's 2nd law. (04)
- d. The volume of gas 210 cc of a temperature of 27°C . Find its volume if temperature is increased to 127°C at constant pressure. (08)

- IV. a. The critical angle for glass is 30° . Calculate the refractive Index of glass. (04)
b. Define wave velocity and wave length. What is a stationary wave? Explain nodes and antinodes. (08)

OR

c. Calculate in meters the wave length of radio waves broad cast at a frequency of 1500 KHZ, assuming the velocity of waves to be 3×10^8 meters. (04)

d. Derive the relation $\mu = \frac{\sin\left(\frac{A+D}{2}\right)}{\sin\frac{A}{2}}$ (08)

V. a. 3 Capacitors of capacitance $2\mu\text{f}$, $4\mu\text{f}$ and $9\mu\text{f}$ are connected in parallel. Calculate the equivalent capacitance. (04)

b. Derive the equation for equivalent resistance when the resistors are connected in series. (08)

OR

c. A current of 4A flows through a resistance 1500Ω . Find the potential difference across the ends of the conductor. (04)

d. Give the circuit diagram of wheat stone bridge. Obtain the condition for balancing the wheat stone bridge. (08)

VI. a. Explain intrinsic and extrinsic semi conductors? (04)

b. Describe the construction and working of a NPN Transistor. (08)

OR

c. Draw the working of a full wave and half wave Rectifiers, with a neat circuit diagrams. (04)

d. Give the symbol, logical expression and truth table of basis gate "AND" & "OR" gates. (08)



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DIPLOMA IN HANDLOOM AND TEXTILE TECHNOLOGY
FIRST YEAR (REGULAR & BACK PAPER) – APRIL/MAY-2016

1.3 – Applied Physics

Time: 3 Hrs

Max Marks: 80

PART A

- I. Answer all questions within TWO to THREE Sentences. (2 x 10 = 20)
- Write the dimensional formula for "Power" and "Pressure".
 - Name any two physical quantities having the same dimension formula.
 - State Charle's Law.
 - Convert 23^o c into Kelvin scale.
 - Define total internal reflection.
 - What is meant by longitudinal waves?
 - State Ohm's law.
 - What are the units of Resistance and Capacitance?
 - What is meant by intrinsic semiconductor?
 - Draw the symbol of a NOT gate and write down if truth table.

PART B

II. Answer the following questions in details.

- Prove that $v^2 = u^2 + 2as$ is dimensionally correct. (4)
- Give the dimensional formula for
(i) Force (ii) Energy (iii) Frequency (iv) Wavelength. (8)

OR

- What are the uses of dimensional formula? (4)
- Write the limitations of dimensional analysis.
Derive the equation $v=u+at$ is dimensionally correct. (8)

- III. (a) Define volume and pressure coefficient. (4)
(b) Describe an experiment to determine the volume co-efficient of air at constant pressure. (8)

OR

- Explain Kelvin Scale of temperature. (4)
- A certain volume of gas at 30^oc is heated at constant pressure, so that volume becomes 3 times the original volume. Calculate the final temperature. (8)

- IV. a) Define wave velocity and wavelength. (4)
b) Explain (i) free (ii) damped and forced oscillations. (8)

OR

- Define refractive index of a prism and total internal prism. (4)
- Derive the relation $\mu = \frac{\sin\left(\frac{A+D}{2}\right)}{\sin\left(\frac{A}{2}\right)}$ (8)

P.T.O.

- V. a) State Kirchoff's laws. (4)
b) Explain the application of Kirchoff's laws to wheat stone's Bridge. (8)

OR

- c) State and explain Coulomb's inverse law in electro statistics. (4)
d) 3 resistors of resistance 5 ohm, 3 ohm and 2 ohm are connected in parallel. Calculate the equivalent resistance. (8)
- VI. a) Write a note on extrinsic semiconductor. (4)
b) Explain the working of Half wave rectifier, with a neat circuit diagram. (8)

OR

- c) Deduce the relation between α and β . (4)
d) Explain the construction and working of NPN transistor. (8)

GHY 3

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DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY FIRST SEMESTER (OLD SYLLABUS BACK PAPER) EXAMINATION – APRIL/MAY-2016 1.3 APPLIED PHYSICS

Time: 3 Hours

Max. Marks: 80

Answer all questions within two to three sentences.

2x10=20

PART-A

- i. a) What is meant by derived quantities?
- b) Write the expansion of MKS and CGS System of units.
- c) State Boyle's law.
- d) Define volume coefficient of a gas.
- e) Define magnification.
- f) Write a note on damped oscillations.
- g) Draw the circuit diagram of Resistors in parallel.
- h) Define potential difference.
- i) What is meant by semiconductor?
- j) Draw the circuit diagram of Half wave rectifier.

PART-B

Answer the following questions in details (4+8)x5=60

- II. a) Give the dimensional formula for Frequency and Angle. 4
- b) Prove that $S = ut + \frac{1}{2} at^2$ is dimensionally correct. 8
- OR
- c) What are the uses of dimensional formula? 4
- d) Prove by dimensional method $1 \text{ ms}^{-2} = 100 \text{ Gal}$. 8
- III. a) State Charle's laws (I & II) 4
- b) The volume of gas 210 cc of a temperature of 23°C . Find its volume if temperature is increased to 120°C . at constant pressure. 8
- OR
- c) What are the three types of expansion of gases? 4
- d) Derive ideal gas equation. 8
- IV. a) What is stationary wave? Explain nodes and anti nodes. 4
- b) Define velocity. The velocity of sound in water is 1200 ms^{-1} , find the frequency of sound wave in water having a wave length of 6 m. 8
- OR
- c) Calculate the wavelength of radio waves broad cast at a frequency of 1000 KHZ, assuming the velocity of waves to be $3 \times 10^8 \text{ MS}^{-1}$ 4
- d) With a neat diagram, explain the working of simple microscope. 8

P.T.O.

- V. a) State Coulomb's inverse square law. 4
b) Give the circuit diagram of wheatstone bridge. Obtain the condition for balancing the wheatstone bridge. 8
- OR
- c) State Ohm's law. A current of 10^{-3} A flows through a conductor whose ends are at a potential difference of 5 V. Find the resistance of a conductor. 4
d) Derive the expression for effective resistance are connected in series. 8
- VI. a) Explain p-type semi conductor 4
b) Explain the working of full wave rectifier. 8
- OR
- c) Write a note on PNP transistor. 4
d) Give the symbol, logical expression and truth table of basic logic gates(AND, OR & NOT) 8

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DIPLOMA IN HANDLOOM AND TEXTILE TECHNOLOGY
FIRST YEAR (2014 - REGULATION) EXAMINATION - NOV/DEC-2016

1.3 – APPLIED PHYSICS

Time: 3 Hours

Max.Marks: 80

PART – A

- I. Answer the following questions in two or three sentences : (2X10=20)
- What is the unit of Acceleration in MKS System?
 - Write down the dimensional formula of Velocity?
 - Convert 0°C into Kelvin scale?
 - Define Volume coefficient of gas?
 - Which type of lens is used in simple Microscope?
 - Give one example of Transverse wave motion?
 - Write down charge of electron?
 - Give the formula for equivalent capacitance when nos. of capacitors are connected in parallel?
 - Which type of impurity is added to pure semiconductor to form N-Type semiconductor?
 - What is meant by extrinsic semiconductors?

PART B

- II. Answer all the questions in detail
- Write down the limitations of dimensions? (4)
 - Prove that $v=u + at$ is dimensionally correct. (8)
- (OR)
- Write down the name of fundamental physical quantities and their units in MKS System? (4)
 - Convert 10 m/sec^2 into cm/sec^2 with the help of dimensions. (8)
- III. A) State Boyle's law with neat diagram? (4)
- B) Volume of given mass of gas is 20 cc at a pressure of 200 cm of Hg? Find the volume of same mass of gas when its pressure is reduced to half. (8)
- (OR)
- C) State Charl's law with neat diagram? (4)
- D) A mass of nitrogen occupies 500 cc at 10°C under pressure of 76 cm of Hg. Find its volume at 100°C pressure being same? (8)
- IV. A) Describe constructional feature and working of simple microscope with neat diagram? (4)
- B) Describe total internal reflection with neat diagram and also give condition for total internal reflection? (8)
- (OR)
- C) Define Free vibrations, Damped vibration and Forced vibration? (4)
- D) A radio station emitting waves of wave length 100 Meters and the velocity of waves are $3 \times 10^8\text{ m/sec}$. calculate the frequency of the emitted waves? (8)

- V. A) Three capacitors each of $1 \mu\text{F}$ connected in series, find out the equivalent capacitance of the system? (4)
B) Find out the equivalent resistance when nos. of resistance is connected in parallel? (8)
- (OR)
- C) Three resistances each of 3Ω are connected in series find out equivalent resistance of system? (4)
D) Find out equivalent capacitance when nos. of capacitors is connected in parallel? (8)
- VI. A) Describe N-type semiconductor with neat diagram of its bonding structure? (4)
B) Describe functioning of half wave rectifier with neat diagram? (8)
- (OR)
- C) Describe working of N-P-N transistor with neat diagram? (4)
D) Define logic gate? Describe AND gate with truth table? (8)

DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY
FIRST SEMESTER EXAMINATION (2011-REGULATION) NOV/DEC-2016

1.3 APPLIED PHYSICS

TIME: 3 Hours

Max. Marks:80

Note: Answer all questions. Assume standard values of physical constants where ever necessary.

- I. i) What is the unit of Mass in MKS System? 2x10=20
ii) Write down the dimensional formula of Force?
iii) Convert 10° c. into Kelvin scale?
iv) Define Boyle's Law?
v) Define purpose of simple Microscope?
vi) Define amplitude?
vii) Which type of charge is found on an electron?
viii) Give circuit diagram for 02 nos. of capacitors connected in parallel?
ix) Which type of impurity is added to pure semiconductor to form P-Type semi-conductor?
x) What is meant by intrinsic semiconductors?
- II. a) Write down the use of dimensions? (4)
b) Prove that $v^2 = u^2 + 2as$ is dimensionally correct. (8)
OR
c) Write down the name of three derived physical quantities and their units? (4)
d) Convert 1 Newton into Dynes with the help of dimensions. (8)
- III. a) State Charle's law? (4)
b) Volume of given mass of gas is 10 cc at a pressure of 76 cm. of hg. Calculate it's volume if pressure get doubled. (8)
OR
c) Define volume coefficient of gas? (4)
d) Volume of given of gas occupies 50 cc at 10° c. under given pressure. At what temperature it's volume become 60 cc pressure being same? (8)
- IV. a) Describe Transverse wave with example? (4)
b) Derive formula for refractive index of prism. (8)
OR
c) Define Resonance? (4)
d) A broad casting station emitting radio waves of velocity 3×10^8 m/sec. Calculate the wave length of emitted wave if frequency is 1000 KHz. (8)
- V. a) Three capacitors each of $10\mu\text{F}$ connected in parallel, find out the equivalent capacitance of the system? (4)
b) Find out the equivalent resistance when nos. of resistances is connected in series? (8)
OR
c) Five resistances each of 5Ω are connected in parallel find out equivalent resistance of system. (4)
d) Find out equivalent capacitance when nos. of capacitors is connected in series? (8)
- VI. a) Describe Conductor, Insulator and Semiconductor? (4)
b) Describe functioning of full wave rectifier with neat diagram? (8)
OR
c) Describe working of P-type semiconductor with neat diagram? (4)
d) Define logic gate? Describe OR gate with truth table? (8)

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DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY

ANNUAL /SEMESTER EXAMINATION APRIL/MAY-2017 (2014-REGULATION)

Time : 3 Hours
FIRST YEAR

Max. Marks : 80

1.3 Applied Physics

Part – A

10 x 2=20 Marks

- 1 What is the unit of momentum in C.G.S. system?
- 2 Write an example of physical quantity having no dimensions.
- 3 State Boyle's law for an ideal gas.
- 4 Convert 100° Kelvin to centigrade scale.
- 5 Define refractive index of a medium with respect to other medium.
- 6 What is the relation between frequency and time period of oscillation?
- 7 State the Coulomb's law for electrostatic force between two charges.
- 8 If r_1 and r_2 are the resistances of 2 resistors connected in parallel, then what will be their collective resistance?
- 9 Which type of material is added with Germanium to create an N-type semiconductor?
- 10 Write the logic operation or truth table for 'NOT' logical operation.

PART-B

12 x 5= 60 Marks

- 11 A) Classify physical quantities on the basis of their dimensions. (4)
B) Prove that the kinematic equation $S = ut + \frac{1}{2} at^2 + d$, is dimensionally correct if 'd' (8)
- (OR)
- C) Write on any two uses of dimensional formula. (4)
D) Convert 50 Joule into erg using dimension. (8)
- 12 A) A mass of gas occupies 100 cm^3 at temperature of 50° C . At what temperature its volume will get doubled if the pressure is kept constant. (4)
B) What are variable properties of a gas? State and explain the Charle's Law for expansion of gases. (8)
- (OR)
- C) What is the volume coefficient of expansion of gases? Define Charle's law on the basis of that. (4)
D) Derive ideal gas equation using Boyle's law and Charle's law. (8)

(2)

- 13 A) What is total internal reflection? Define the critical angle. (4)
B) Derive the expression for the refractive index of a prism. (8)

(OR)

- C) Define transverse and longitudinal waves. (4)
D) Derive expression for magnification in a simple microscope using a ray diagram. (8)
- 14 A) Define Ohm's law and state the nature of the $V \sim I$ curve for a pure resistor. (4)
B) State Kirchoff's laws for electrical circuits. Describe how it is used in wheat stone bridge to find unknown resistance. (8)

(OR)

- C) What is Coulumb's law of electrostatics? Write it's mathematical form indicating the meaning (4)
D) What is grouping of resistances? Find the equivalent resistance when resistors are connected in series and when they are connected in parallel. (8)
- 15 A) What are extrinsic and Intrinsic semiconductors? (4)
B) Using diagrams describe how a P-N junction is used as a full wave rectifier. (8)

(OR)

- C) Differentiate among conductors, insulators and semiconductors. (4)
D) With a diagram describe how an N-P-N transistor works in common base mode. (8)

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DIPLOMA IN HANDLOOM AND TEXTILE TECHNOLOGY

ANNUAL/SEMESTER EXAMINATION – April/May – 2018

(Regulation - 2014)

Year/Semester: First year

Time : 3 Hours

Subject Code & Name : 1.3 Applied Physics

Max. Marks: 80

PART - A

(2×10=20 marks)

Answer all the questions in two to three sentences

1. Name the supplementary SI quantities and give their SI units.
2. Give the dimensional formula for 'Frequency' and 'Wavelength'.
3. Define pressure coefficient of gas
4. State Boyle's law.
5. What is critical angle.
6. Define progressive waves.
7. Define capacitance. Give its SI unit.
8. State Kirchoff's current law.
9. Write the truth table of NOT gate.
10. Draw the symbol of PNP transistor and mark the terminals.

PART - B

((4+8)×5= 60 marks)

Answer all the questions in detail

- 11) A) Define fundamental and derived quantities. Give examples. (4)
B) Prove by dimensional method $1 \text{ N} = 10^5 \text{ dyne}$ (8)
(OR)
C) Express 90 km/min in m/s. (4)
D) Give the dimensional formula for (i) pressure (ii) impulse (iii) power (iv) Momentum (8)
- 12) A) The volume of a gas is 150 cc at a temperature of 27 °C. Obtain its volume if the gas is heated to 147 °C at constant pressure ? (4)
B) Derive ideal gas equation. (8)

(OR)

- C) Explain Kelvin scale of temperature. (4)
- D) Describe an experiment to determine the volume coefficient of a gas at constant pressure. (8)
- 13) A) The critical angle for glass is 60° . Calculate the refractive index of glass. (4)
- B) Describe the working of a simple microscope with neat diagram. (8)
- (OR)
- C) Calculate the wavelength of waves oscillating at a frequency of 1500 kHz, assuming the velocity of waves to be 4×10^7 m/s. (4)
- D) Explain free, damped and forced oscillations. (8)
- 14) A) A current of 3 A flows through a conducting material whose ends are at a potential difference of 6 V. Find the conductance of the conducting material. (4)
- B) Derive the condition for balancing Wheatstone's Bridge circuit. (8)
- (OR)
- C) Three resistors of resistance 2 ohm, 4 ohm and 6 ohm are connected in parallel. Calculate the equivalent resistance. (4)
- D) Derive an expression for equivalent capacitance when capacitors are connected in series and parallel. (8)
- 15) A) Draw the common base (CB) mode and common emitter (CE) mode configurations of a NPN transistor. (4)
- B) Describe with a neat diagram, the construction and working of a full wave rectifier. (8)
- (OR)
- C) For a transistor, the current gain $\alpha = 0.65$. If the transistor is connected in common-emitter mode and if base current is 0.2 mA, find the value of collector current. (4)
- D) What are extrinsic semiconductors? Describe the types of extrinsic semiconductors in detail. (8)

5/11/18 - 3

INDIAN INSTITUTE OF HANDLOOM TECHNOLOGY

BARGARH/GUWAHATI/FULIA/JODHPUR/SALEM/VARANASI/CHAMPA/KANNUR/KHTIGADAG/SPKM IBIT/VENKATAGIRI

DIPLOMA IN HANDLOOM AND TEXTILE TECHNOLOGY

ANNUAL/SEMESTER EXAMINATION – April/May – 2018

(Regulation - 2011)

Year/Semester: First Semester

Subject Code & Name: 1.3 Applied Physics

Time : 3 Hours

Max. Marks: 80

(2×10=20 marks)

PART - A

Answer all the questions in two to three sentences

1. Give the C.G.S. unit of force.
2. State the principle of homogeneity.
3. Define volume coefficient of gas.
4. Convert 45°C into Kelvin scale.
5. Define amplitude.
6. What are stationary waves.
7. State Ohm's law.
8. Define inductance.
9. Define doping.
10. What are the majority and minority charge carriers in p-type semiconductor?

PART - B

((4+8)×5= 60 marks)

Answer all the questions in detail

- 11) A) Write down the fundamental quantities in SI system and give their units. (4)
- B) Prove by dimensional method $1 \text{ J} = 10^7 \text{ ergs}$. (8)

(OR)

- C) Prove $v = u + at$ is dimensionally correct. (4)
- D) Give the applications of dimensional formula and explain them with suitable examples. (8)

- 12) A) State Boyle's law and Charle's law. (4)
- B) The pressure of a given mass of gas is increased 10 times to its initial pressure, the volume of the gas being kept constant. If the initial temperature of the gas is 227°C, find the final temperature. (8)

(OR)

C) The initial temperature raises 5 times to its original temperature at constant pressure. Its initial volume is 50 cc. Find its final volume. (4)

D) Define coefficient of linear, superficial expansion and derive the relation between them. (8)

13) A) Find the refractive index of a glass prism having an angle of minimum deviation 50° . Given the angle of prism is 40° . (4)

B) Derive an expression for refractive index of a prism. (8)

(OR)

C) Explain total internal reflection and give the conditions for obtaining total internal reflection. (4)

D) Explain transverse and longitudinal waves. (8)

14) A) Explain Kirchoff's voltage law with a neat circuit. (4)

B) State and explain Coulomb's inverse square law in electrostatics. (8)

(OR)

C) Two resistors $10\ \Omega$ and $8\ \Omega$ are connected in series. If the ends of the combination are connected in a battery of emf 15 V, find the current through the circuit. (4)

D) Derive an expression for equivalent resistance when resistors are connected in series and parallel. (8)

15) A) What are intrinsic semiconductors? Explain how they behave at temperature $T < 0\text{ K}$ and $T > 0\text{ K}$. (4)

B) What are logic gates? Explain in detail (i) AND gate and (ii) OR gate. (8)

(OR)

C) Give the differences between conductors, insulators and semiconductors. (4)

D) Explain in detail the working of a forward biased P-N junction diode with a neat diagram. (8)

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DIPLOMA IN HANDLOOM AND TEXTILE TECHNOLOGY (REGULATION-2014)
ANNUAL/SEMESTER (BACK PAPER) EXAMINATION-NOV./DEC.- 2018

Year / Semester: Ist Year

Time: 3 Hours

Subject Code & Name: 1.3 Applied Physics

Max.Marks:80

PART-A

Answer all the questions within two or three sentences

(2 x 10 = 20 Marks)

- 1) What is the unit of energy in C.G.S. system?
- 2) Write dimensions of Power and Force.
- 3) 27 degree centigrade is how much degree Kelvin?
- 4) State Boyle's law for an ideal gas.
- 5) What is an optical prism?
- 6) What is the relation between velocity and frequency of a wave?
- 7) State the Ohm's law.
- 8) What is electric potential? State its standard unit.
- 9) What is an electrical insulator? Give one example.
- 10) Define Logic gate.

PART-B

Answer all the questions

(4+8) x 5=60 Marks)

- 11) A. Write the units used in MKS and CGS system of measurement. Write about their relations. (4)
B. Prove by dimensional analysis that the kinematic relation $v = u + at$ is correct. (8)
(OR)
C. Work = Force X Displacement. Dimensionally analyzing the RHS, find the dimensions of work (4)
D. Convert 1 Joule into erg using dimension. (8)
- 12) A. A mass of gas occupies 100 cm^3 at temperature of 27°C . At what temperature its volume will get doubled if the pressure is kept constant? (4)
B. What is the pressure of a gas? State and explain the Charle's Law for expansion of gases. (8)
(OR)
C. Describe an experiment to determine pressure coefficient of a gas at constant volume. (4)
D. Derive ideal gas equation. (8)
- 13) A. State the two laws of refraction. What is Refractive index? (4)
B. Derive the expression for the refractive index of a prism. (8)
(OR)
C. If wavelength of a wave is 50 cm and its frequency is 400 Hz then what is the wave velocity? (4)
D. Derive expression for magnification in a simple microscope using a ray diagram. (8)

14. A. Define Coulumb's law of electrostatics and write the meaning of each symbol used in it. (4)
B. Describe how wheat stone bridge is used to find unknown resistance. (8)
(OR)
C. State Kirchoff's laws for electrical circuits. (4)
D. What is grouping of resistances? Find the equivalent resistance when resistors are connected in series. (8)
15. A. How the P-type and N-type semi-conductors are made? (4)
B. Using diagrams describe how a P-N junction is used as a half wave rectifier. (8)
(OR)
C. Differentiate among conductors, insulators and semi-conductors. (4)
D. With a diagram describe how an P-N-P transistor works. (8)

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DIPLOMA IN HANDLOOM AND TEXTILE TECHNOLOGY (Regulation – 2014)
SEMESTER (REGULAR & BACK PAPER) EXAMINATION – April / May -2019

Year / Semester : First year
Subject Code & Name: 1.3 Applied Physics

Time: 3 Hours
Max. Marks: 80

PART - A

Answer all the questions in two to three sentences

(2×10=20 marks)

1. Write the limitations of dimensional formula.
2. What are derived quantities? Give examples.
3. Define absolute zero of temperature.
4. Is the temperature -273 K attainable? Justify your answer.
5. Give the expression to find the magnification of a simple microscope.
6. What are damped vibrations?
7. Define Inductance. Give its SI unit.
8. A current of 10^{-2} A flows through a conductor whose ends are at a potential difference of 3 V. Find The resistance of the conductor?
9. What are intrinsic semiconductors?
10. What is a rectifier?

PART - B

Answer all the questions in detail

(4+8)×5=60 marks)

- 11) A) Give the dimensional formula for (i) Momentum (ii) Stress (4)
- B) Explain the applications of dimensional formula with examples. (8)
- (OR)
- C) What are fundamental quantities? Give their units in MKS and CGS system. (4)
- D) Prove by dimensional method $1 \text{ ms}^{-2} = 100 \text{ Gal}$. (8)
- 12) A) Explain pressure coefficient of expansion of gas. (4)
- B) State and explain Boyle's law and Charle's law. (8)
- (OR)

- C) A sample of helium has a volume of 521 m^3 at a pressure of 75 cm of Hg and at a temperature of 18°C . When the temperature is increased to 23°C , what is the volume of helium, the pressure being maintained constant? (4)
- D) Derive the ideal gas equation using gas laws. (8)
- 13) A) Explain total internal reflection with a diagram and give the conditions for obtaining total internal reflection. (4)
- B) Derive an expression for refractive index of prism. (8)
- (OR)
- C) What is the frequency of a mechanical wave that has a velocity of 1.77 m/s and a wavelength 12.05 m? (4)
- D) State and explain transverse, longitudinal and stationary waves. (8)
- 14) A) State and explain Coulomb's law in electrostatics. (4)
- B) Derive an expression for equivalent resistance when resistors are connected in series and parallel. (8)
- (OR)
- C) Three capacitors of capacitance $2 \mu\text{F}$, $4 \mu\text{F}$ and $6 \mu\text{F}$ are connected in series. Calculate the equivalent capacitance. (4)
- D) State and explain Kirchoff's current and voltage laws. (8)
- 15) A) Differentiate between conductors, semiconductors and insulators with examples. (4)
- B) With a neat diagram, describe the construction and working of a PNP transistor in common Base (CB) mode. (8)
- (OR)
- C) Differentiate between n-type and p-type semiconductors. (4)
- D) Give the symbol, truth table and logical expression of OR, AND and NOT gate. (8)

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DIPLOMA IN HANDLOOM & TEXTILE TECHNOLOGY (REGULATION - 2014)

ANNUAL / SEMESTER EXAMINATION – NOV/DEC -2019

Year/Semester: I Year Back Paper

Time: 3Hours

Subject Code & Name: 1.3Applied Physics

Max. Marks: 80

PART –A

Answer all the questions within two to three sentences.

(2×10)marks

1. What is the unit of Power in MKS System?
2. Write down the dimensional formula of Momentum.
3. Convert - 40°C into °F.
4. Define Volume coefficient of gas.
5. Which type of lens is used in simple microscope.
6. Define optical instruments.
7. Write down the nature and value of charge on Neutron.
8. Define Coulomb's law for electric charges.
9. Define Transistor.
10. Which type of bonds are normally found in semiconductors.

PART –B

Answer all the questions in details

(4+8)5 = 60 Marks

11. A. Write down the limitations of dimensions. 4
- B. Check the dimensional correctness of formula $h = ut + \frac{1}{2}gt^2$ 8

OR

- C. What is derived quantity give two example? 4
- D. Density of water in CGS system is 1 gm/cm convert it into MKS System i.e. Kg/m³ with the help of dimensions. 8
12. A. State Charl's law with neat diagram. 4
- B. Find the volume of a mass of gas at a pressure 200 cm of hg if the volume of same mass of gas is 10 cc at a pressure of 76 cm of hg. 8

OR

- C. State Boyle's law with neat diagram. 4
- D.A mass of nitrogen occupies 100 cc at 10°C under pressure of 76 cm of hg. At what temperature it's volume become 125 cc and pressure being remain same. 8
13. A. State law of Refraction. 4
- B. Describe total internal reflection with neat diagram and also give condition for total Internal Reflection. 8

OR

- C. Define Free vibrations and Damped vibration. 4

- D. A radio station emitting sound waves of wave length 300 Meters with frequency 1×10^6 per sec Calculate the velocity of emitted sound wave? 8
14. A. Find out the equivalent resistance when 4 number of resistances is connected in parallel. 4
- B. Three capacitors each of $3 \mu\text{F}$ connected in series and this combination is connected with another capacitor of $1 \mu\text{F}$ in parallel, find out the equivalent capacitance of the system. 8

OR

- C. Find out the equivalent capacitance when 3 number of capacitors is connected in Parallel. 4
- D. Three resistances of 1Ω , 3Ω , 5Ω respectively are connected in series and the ends of Connection are connected with 27V battery. Find out the voltage and current across each resistance. 8
15. A. Describe N-type semiconductor with neat diagram of showing bonding structure.
- B. Describe functioning of centre tap full wave bridge rectifier with neat diagram. 8

OR

- C. Describe working of N-P-N transistor with neat diagram. 4
- D. Define logic gate. explain the same with circuit diagram and truth table. 8

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