

**CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY**  
**HEAD OFFICE : GUINDY, CHENNAI – 600 032.**  
**ACADEMIC CELL**  
**FIRST SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours  
Course : DPMT  
Subject : Communication English-I

Max. Marks: 60  
Date : 08.01.2024  
Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

1. Choose the correct Modal from the following: \_\_\_ we go home now, Sir?  
a. Can            b. Would            c. May            d. Shall
2. Choose the correct verb form of Pronoun: \_\_\_\_\_ are you speaking to?  
a. Whom            b. Which            c. Who            d. What
3. Choose the correct phrasal verb: 'Though we have sorted out our differences, she still keeps \_\_\_\_\_ me,' Marx said dolefully.  
a. Going with            b. going for            c. going at            d. none of the above
4. I am not feeling hungry, I \_\_\_\_\_ (take) heavy breakfast. (Correct Tense Form)
5. Don't worry; we are prepared \_\_\_\_\_ everything. (Correct Preposition)
6. Give up smoking \_\_\_\_\_ you will have to face dire consequences. (Correct Conjunction)
7. Adjectives are the parts of speech that qualify verbs and adverbs. (True/False)
8. 'Jury' is a Compound Noun. (True/False)
9. Exclamation Marks can be used after Interjections. (True/False)
10. Expand: BIS
11. Expand: AICTE
12. Expand: CSTS

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

1. Define Clarity in communication.
2. What is Visual Communication?
3. Define Auxiliary Verbs.
4. What is an Abstract Noun?

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

1. Explain Noun and its different types using suitable examples.
2. Explain the use of Capital Letters in English using examples.
3. What is Conciseness in communication? How can effective conciseness be maintained?
4. How can someone build a strong presence with Visual Communication?
5. Explain Preposition and its different types.
6. What is a Sentence? Explain different components of sentence in English language.
7. Define Verb and its different types using suitable examples.

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

1. Write a dialogue between a father and a son on the growing use of internet and the threat to cyber security.
2. Write an essay on the topic: COVID – 19.
3. Write a letter to the Editor of a local newspaper highlighting the problem of improper garbage dump and littering in your locality.

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**ACADEMIC CELL**  
**FIRST SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours  
 Course : DPMT  
 Subject : Workshop Mathematics

Max. Marks: 60  
 Date : 09.01.2024  
 Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

1. The quadratic equation  $x^2 + 3x + 2 = 0$  has  
 (a) Two equal roots      (b) Two real and unequal roots      (c) No real roots      (d) None of these
2. Evaluate 20% of 90 + 30% of 80.  
 (a) 40      (b) 42      (c) 80      (d) 82
3. If  $n$  is a positive integer, then the number of terms in the expansion of  $(x - y)^n$  is:  
 (a)  $n$       (b)  $n + 1$       (c)  $n + 2$       (d) None of these.
4. If radius of a circle is  $10\text{ cm}$ , then the area of circle is \_\_\_\_\_  $\text{cm}^2$ .
5. The area of a square of length 4 cm is equal to \_\_\_\_\_.
6. The volume of a cube of side 2 cm is equal to \_\_\_\_\_.
7. If the two straight lines are parallel. Then their slopes are equal. (True/False)
8. A quadratic equation  $ax^2 + bx + c = 0$  has equal roots, then  $b^2 - 4ac = 0$ . (True/False)
9. The Homogeneous equation  $ax^2 + 2hxy + by^2 = 0$  represents two straight lines passing through the origin, if  $h^2 - ab < 0$ . (True/False)
10.  $\sin^2 30^\circ + \cos^2 30^\circ =$  \_\_\_\_\_.
11.  $1 + \tan^2 A =$  \_\_\_\_\_.
12.  $\sin(A + B) =$  \_\_\_\_\_.

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

1. Find the length of the edge of a cube whose surface area is given as  $54\text{ cm}^2$
2. Determine the value of  $k$  for which the quadratic equation  $x^2 + 4x + k = 0$  has equal roots.
3. Find the combined equation of lines  $y = x$  and  $y + x = 0$
4. If circumference of a circle is  $16\pi$  cm, then find the radius of the circle.

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

1. The area of a rhombus is  $240\text{ cm}^2$  and one of the diagonals is 16 cm. Find the other diagonal.
2. Find the angle between the pair of straight lines represented by the equation  $12x^2 - 10xy + 2y^2 = 0$
3. Find the 2<sup>th</sup> term in the expansion of  $(x + 2y)^4$ .
4. Solve:  $x^2 + 6x + 5 = 0$  by using the quadratic formula.
5. If the equation of circle is  $x^2 + y^2 + 2x + 6y + 2 = 0$ , then find the radius and center of the circle.
6. If  $A, B$  are acute angles such that  $\sin A = 3/5$ ,  $\cos B = 4/5$ , find  $\sin(A + B)$ .
7. Find the volume of cylinder of radius 2 cm and height 4 cm.

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

1. The area of the circle is  $16\pi$  square units. If the centre of the circle is  $(2, 3)$ , then find the equation of the circle.
2. Find the middle term in the expansion of  $(x + 2y)^6$ .
3. Find the value of  $\tan(15^\circ)$

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**FIRST SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours  
Course : DPMT  
Subject : Engineering Physics

Max. Marks: 60  
Date : 10.01.2024  
Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

- 'Parsec' is the unit of \_\_\_\_\_  
a. Distance                      b Time                      c Angle                      d Mass
- A train travels 4km due east and then 3km due north and finally come back to the starting point travelling 5km along south-west direction. What is the net displacement?  
a. 12km                      b 5km                      c 0km                      d None of these
- Oil spreads over water while water does not spread over oil. This is due to the property of  
a. Elasticity                      b Viscosity                      c Surface tension                      d Friction
- In Isothermal process, the quantity which remains constant is \_\_\_\_\_
- The state of achieving more number of atoms in the higher energy state than in the lower energy state is known as \_\_\_\_\_.
- If the diameter of a wire is doubled keeping its length same, its Young's modulus of elasticity will \_\_\_\_\_.
- Dimensional formula of work and energy is same (True/False)
- Centripetal and centrifugal forces have same magnitude and same direction.( True/False)
- The unit of power of Lens is Diopter. ( True/False)
- O.F.C stands for \_\_\_\_\_.
- S.I. Stands for \_\_\_\_\_.
- M.K.S. stands for \_\_\_\_\_.

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

- Define the Pumping.
- Write the dimensional formula of  
a. Gravitational Constant (G)    b Surface Tension
- Define rest and motion.
- Write the modes of heat transfer.

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

- Define elasticity and prove that steel is more elastic than rubber.
- Derive the expression for the Newton's law of viscosity.
- Write a short note on Total Internal Reflection and define the critical angle.
- Temperature of certain bath gives the same reading on both the centigrade and Fahrenheit scales. Calculate the temperature of bath.
- Define the Unit and measurement and write a short note on system of units.
- A particle moving in a circle of radius 1.0 meter has its angular velocity increased, in one minute, by 90rad/m. Calculate  
a. Angular acceleration    b Tangential linear acceleration
- Explain about streamline and turbulent flow.

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

- A projectile is fired with velocity 'u', making an angle  $\theta$  with the horizontal, prove that the path followed by projectile is parabolic, and also find the condition to achieve maximum horizontal range.
- State the triangle's law of vectors addition and derive the expression for magnitude and direction of resultant of two vectors.
- Write a short note on construction of LASER and explain about its different applications.

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**FIRST SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours  
Course : DPMT  
Subject : Electrical & Electronics Engineering

Max. Marks: 60  
Date : 11.01.2024  
Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

1. Unit of Current is  
(a) Ampere (b) Volt (c) Hertz (d) Farad
2. A DC Motor converts  
(a) electrical energy into mechanical energy  
(b) mechanical energy into electrical energy  
(c) magnetic energy into electrical energy  
(d) electrical energy into magnetic energy
3. Transformer core laminations are made of  
(a) Cast iron (b) Wrought iron (c) Silicon Steel (d) Cast steel
4. Majority carrier in N-type semiconductor is -----.
5. A bridge rectifier requires ----- numbers of diode for construction.
6. Yoke carries the ----- produced by the poles.
7. A capacitor stores electric charge. (say True or False)
8. In AND Gate if both the inputs are 1, the output is 1. (say True or False)
9. The principle of DC Generator is Faraday's Law of Electromagnetic Induction. (say True or False)

**Write full form of the following:**

10. EMF
11. R M S value
12. Wb

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

1. State Ohm's law.
2. What is back EMF?
3. Draw the symbol of NOT Gate.
4. State Kirchhoff's current law.

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

1. Discuss Faraday's law of Electromagnetic Induction.
2. What is semiconductor material? Give two examples.
3. Write four applications of DC Generator.
4. Write a short note on Commutator.
5. Write a short note on p-n junction diode. Draw the current – voltage characteristics of diode.
6. Distinguish between single phase and three phase power supply.
7. Draw the schematic diagram of DC Motor. Label it properly.

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

1. Discuss in details about the electrical risk, safety and precaution.
2. Write down the Logic Gate symbol and truth table of  
(a) OR Gate (b) AND Gate (c) NOR Gate (d) NAND Gate
3. Discuss the construction and working principle of Transformer.

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**FIRST SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours  
Course : DPMT  
Subject : Environmental Sciences

Max. Marks: 60  
Date : 12.01.2024  
Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

**Choose the correct option:**

- The source of energy in an ecosystem is  
a) ATP                      b) Sunlight                      c) D.N.A                      d) R.N.A
- Which of the following is the major cause of pollution?  
a) Plants                      b) man                      c) fungi                      d) hydrocarbon gases
- The major pollutant from auto mobile exhaust is  
a) NO                      b) CO                      c) SO<sub>2</sub>                      d) Soot

**Fill in the blanks with appropriate words:**

- .....is the most abundantly available fossil fuel.
- Herbivores are..... consumers.
- Bhakra Nangal is an important.....station in India.

**Say True or False**

- Biosphere is made of atmosphere, hydrosphere, and lithosphere. Say True or False
- The movement of water from the surface of plants into the atmosphere by a process called transpiration. Say True or False
- A mineral is a naturally occurring substance, represent by a chemical formula Say True or False

**Write the full form**

- CO<sub>2</sub> .....
- MAB stands for .....
- W.W.F stands for.....

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

- What is Environment?
- Draw grassland food Chain.
- Give two examples of Conventional Sources and Non Conventional Sources.
- What are autotrops?

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

- Describe the structure of ecosystem.
- Difference between renewable and non renewable resources.
- What is acid rain also explain its effect.
- Briefly explain green revolution.
- What are the causes of water pollution?
- Explain briefly the importance of food chain and food web.
- How can minerals be conserved?

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

- What are the objectives of Environment Protection Act?
- What is a forest resource? Explain the function of forest resources.
- Explain in details the effect of human activities on Environment.

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