TED (15) – 1001

(REVISION — 2015)

Reg. No. ....

Signature ....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

ENGLISH FOR COMMUNICATION - I

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

Marks

I Read the following excerpts and answer the questions that follow :

1. He loved his father, wanted more than anything in the world his approval. If only he could conduct himself properly this morning, he knew that he would get it.

   (a) Who is the 'he' mentioned here ?   1

   (b) What was special about 'this morning' ?   2

   (c) How did the morning turn out for him ?   4

2. "We have chosen this locality for our first meeting because it is isolated and peaceful".

   (a) Identify the speaker.   1

   (b) Which locality was chosen for the meeting ?   2

   (c) What was the outcome of the meeting ?   4

3. Despite the fact that Hitler glared at us from the stands not a hundred yards away, Luz shook my hand hard and it wasn't a fake "smile with a broken heart".

   (a) Whom did Hitler glare at ?   1

   (b) Why did Luz shake his hand ?   2

   (c) Comment on the relationship between the speaker and Luz.   4

4. Then a water-hydrant played its part and the buggy upturned. The driver was flung on the road in front of a certain brownstone mansion.

   (a) What is the name of the driver ?   1

   (b) How is the Brownstone Mansion significant in this context ?   2

   (c) This accident is a blessing in disguise for the driver. Comment.   4

[1]

PART — B

II 1. Fill up using the appropriate words given in brackets :

(a) The .... of the gun glinted in the light. (mallard, muzzle, mitten)

(b) The .... sinner asked for forgiveness during his confession. (haggard, penitent, iridescent)

(c) Dinosaurs .... from the face of the earth millions of years ago. (chiselled, recycled, vanished)

(d) When a person has an infectious disease, he is usually .... (dishevelled, camouflaged, isolated)

(e) .... is a field sport in which athletes complete by riding a horse over a frame. (fencing, equestrian, archery) $(5 \times 1 = 5)$

2. Read the following sentences and find out the meaning of the words in bold letters from the context.

(a) As a result of having studied history for several years, Nishitha has become quite **erudite** on the subject of art history. (useless, well informed, ignorant)

(b) Though emotions can be expressed, they are **intangible** because they cannot be physically touched. (indefinable, contradictory, acceptable)

(c) He was arrested in 2015 on **spurious** corruption charges, but the court released him the next year when he was proved innocent. (fake, true, reliable)

(d) Eventhough the defendant had broken the law, the **magnanimous** judge gave him the lightest punishment possible. (wealthy, unsuccessful, noble in mind and houghts) $(4 \times 1 = 4)$

3. Correct the errors in collocation and rewrite the sentences :

(a) You need to <u>make</u> a bath before dinner.

(b) I got angry because the kids did not <u>pass</u> attention. $(2 \times 1 = 2)$

4. (a) Write down a synonym of the underlined word in the sentence.

Her paintings have won awards in <u>numerous</u> art shows.

(b) Write the **antonym** of the bold lettered word in the sentence.

Even though the building had an **ancient** appearance, it had all the .... conveniences. $(2 \times 1 = 2)$

III 1. Rewrite the passage correcting the errors given in bold letters.

Malala Yousafsai is a Pakistani activist **which** advocacy for female education has grown into **a** international movement. **In** 9 October 2012 she was seriously injured after a Taliban gunman attempted to murder her. Later in 2014, she received the Nobel Peace Prize along **from** Kailash Satyarthi. $(4 \times 1 = 4)$

2. Fill up the blanks choosing the right words from the help box given.

Medha Patkar is a .... (populous, popular) Indian social activist. She developed interest in social service from a very young age, something which she .... (inhabited, inherited) from her parents. She got involved in many .... (vital, vague) environmental issues and worked .... (diligently, drastically) on two projects, Narmada Bachao Andolan and Lavasa. She also actively supported Anna Hazare in his fight against .... (corruption, contradiction). (5 × 1 = 5)

3. Describe the following picture in a paragraph. (60 words)

5

4. Rewrite the following passage correcting the errors.

Pollution **was** not a new problem now-a-days. Much **have** been done to improve sanitation and public health over the past few years. Yet in modern industrial towns the disposal of waste still **remaining** a big problem. If the situation **continued,** it will be a great threat to posterity. Only self-conscious efforts to protect our environment can **saved** our lives on earth.

5

5. Given below are three notices. Write down what they mean.

DON'T WALK ON GRASS	KEEP LEFT	NO ADMISSION

3

PART — C

IV 1. Write down two points in agreement and two points in disagreement with the topic for group discussion.

The Role of examinations in education system.

4

2. Read the details of Ms. Sruthylaksmi.

Name : Sruthylakshmi
Lives in : Chennai
Education : Completed M.A in English Language and Literature
Additional Qualification : PGDCA
Strengths : reliable, hardworking, innovative
Achievements : Student editor (college magazine)
Hobbies : Reading, playing video games

Imagine that you are Sruthylakshmi and are going for an interview. How would you introduce yourself. Prepare a self introduction.

5

3. India's biggest automobile company Tata is looking for smart, young and dedicated technicians to their different branches. Candidates must have diploma in Automobile or Mechanical Engineering and a minimum of three years experience. Apply within ten days to the HR Manager, Intelecom Pvt. Ltd, Banglore.

Prepare a Cover Letter in response to this advertisement given in The Hindu of 21 October 2017.

5

4. Complete the conversation as directed :

Nikhil : Hi Faisal ! Good evening. What a pleasant surprise ! What brings you to my town ?

Faisal : Good Evening Nikhil. I have been promoted and transferred to your town.

Nikhil : .... (congratulates him)

Faisal : .... (asks for the nearest grocery store)

Nikhil : .... (gives directions) .... (suggests to take an auto)

Faisal : .... (expresses gratitude). See you later.

5

5. Write a paragraph on any one of the following :

(a) Value of time

(b) Violence against women in India

6

6. Imagine that you are the Vice-Principal of your college. Prepare a memo to be circulated among the staff asking their willingness to take-up the charge of the Placement Cell.

6

Or

Your nephew has won the President's medal for the best N.C.C cadet, Construct a conversation between yourself and your nephew congratulating him on his success.

6

7. Prepare five slides for Power Point Presentation based on the paragraph given below :

Sleep deprivation is defined as not obtaining adequate total sleep. When someone is in a chronic sleep-restricted state they'll notice excessive daytime sleepiness, fatigue, clumsiness and weight gain or weight loss. Interestingly, there's a subset of cases whereby sleep deprivation can actually lead to an enhanced mood, alertness, and increased energy. What are the side effects of sleep deprivation ? It's now believed that people who experience short-term sleep restriction are not able to process glucose as efficiently as those who get eight hours of sleep; which means that they have an increased likelihood of developing Type 2 Diabetes. In the year 2005, a study was conducted on a group of rats: for five days the rats were deprived of sleep and, compared to a group of rats which were not deprived of 'dream' sleep, the results showed significant changes in their wound-healing ability. In addition, sleep deprivation adversely affects the brain and cognitive function. Besides the many physical consequences of insufficient sleep, perhaps the most important consequences of sleep deprivation are deficits in working memory and attention. The primary treatment of sleep deprivation is to increase total sleep time. Treating the cause of sleep deprivation is also a general solution to the problem. If a sleep disorder is interrupting sleep, the problem will need to be addressed in order to improve sleep duration and quality. Inadequate sleep hygiene or insufficient sleep is often a cause that needs to be addressed.

6

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

ENGINEERING MATHEMATICS - I

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I   Answer *all* questions. Each question carries 2 marks.

1.   Prove that $\cos^2 A - \sin^2 A = 1 - 2\sin^2 A$.

2.   If $\cos A = \frac{4}{5}$ and A is acute, find $\cos 3A$.

3.   Find the area of the triangle ABC, given b = 3cm, c = 2cm, A = 30°.

4.   If y = x cos x, Find $\frac{dy}{dx}$.

5.   Find the velocity and acceleration at time 't' of a particle moving according
     to $s = t^3 - 2t^2 + 1$.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II   Answer any *five* of the following questions. Each question carries 6 marks.

1.   Express 3 cosx + 4 sinx in the form R sin (x + α), where α is acute.

2.   Prove that $\cos \frac{\pi}{8} + \cos \frac{3\pi}{8} + \cos \frac{5\pi}{8} + \cos \frac{7\pi}{8} = 0$.

3.   Prove that $(a + b) \sin \frac{c}{2} = c \cos \frac{A-B}{2}$.

4.   Differentiate cos x by the method of first principles.

5.   Find $\frac{dy}{dx}$ if $x^3 + y^3 = 3axy$.

6.   Find the equation to the tangent and normal to the curve $x^2 + y^2 = 25$ at (3,-4).

7.   Prove that sin 120° cos 330° + cos 240° sin 330° = 1.

(5×6 = 30)

[2]

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III (a) Prove that $\dfrac{\cos\theta}{1+\sin\theta} + \dfrac{1+\sin\theta}{\cos\theta} = 2\sec\theta$.   5

(b) If $\sin A = \dfrac{3}{5}$ and A is acute, find $\sin 2A$ and $\cos 2A$.   5

(c) Show that $\tan 75° + \cot 75° = 4$.   5

OR

IV (a) Prove that $\dfrac{\operatorname{cosec}A}{\operatorname{cosec}A-1} + \dfrac{\operatorname{cosec}A}{\operatorname{cosec}A+1} = 2\sec^2 A$.   5

(b) If $\sin A = \dfrac{8}{17}$, $\sin B = \dfrac{3}{5}$; A, B are acute, find $\sin(A-B)$ and $\cos(A+B)$.   5

(c) From the top of a light house 90m high, the angles of depression of two boats on the sea level are 45° and 60°. Find the distance between the boats.   5

UNIT — II

V (a) Prove that $\dfrac{\sin 2A + \sin 5A - \sin A}{\cos 2A + \cos 5A + \cos A} = \tan 2A$.   5

(b) Prove that $\cos 55° + \cos 65° + \cos 175° = 0$.   5

(c) Solve $\triangle ABC$, given $a = 5cm$, $b = 8cm$ and $C = 30°$.   5

OR

VI (a) Prove that $\sin 50° - \sin 70° + \sin 10° = 0$.   5

(b) Prove that $\cos 3A + \cos 5A + \cos 9A + \cos 17A = 4\cos 4A \cos 6A \cos 7A$.   5

(c) Solve $\triangle ABC$, given $a = 2cm$, $b = 3cm$ and $c = 4cm$.   5

UNIT — III

VII (a) Evaluate (i) $\lim_{x\to 0} \dfrac{\sin 2x.\cos x}{x}$ (ii) $\lim_{x\to\infty} \dfrac{2x^2 + x + 1}{x^2 - 2x + 1}$ (3 + 3 = 6)

(b) If $x = a\cos^3\theta$, $y = b\sin^3\theta$, find $\dfrac{dy}{dx}$.   4

(c) If $y = a\sin mx$, Prove that $\dfrac{d^2y}{dx^2} + m^2 y = 0$.   5

OR

VIII (a) Evaluate (i) $\lim_{x\to 0} \dfrac{1-\cos x}{x^2}$ (ii) $\lim_{x\to 1} \dfrac{x^2 - 1}{x - 1}$ (4 + 2 = 6)

(b) If $y = \log(\sec x - \tan x)$, show that $\dfrac{dy}{dx} = -\sec x$.   4

(c) If $y = A\sin x + B\cos x$ (A, B are constants), Show that $\dfrac{d^2y}{dx^2} + y = 0$ 5

Marks

Unit — IV

IX (a) Find the equations to the tangent and normal to the curve
$y = 3x^2 + x + 2$ at (1, 2).   5

(b) The radius of a circular plate is increasing in length at 0.1 cm/sec when heated. What is the rate at which the area is increasing when the radius is 12 cm ?   5

(c) An open box is to be made out of a square sheet of side 18 cm by cutting off equal squares at each corner and turning up the sides. What size of the squares should be cut in order that the volume of the box may be maximum ?   5

Or

X (a) Find the velocity and acceleration of a particle at t = 4 seconds whose displacement is given by $S = \frac{1}{2} t^2 + \sqrt{t}$.   5

(b) A circular patch of oil spreads out on water, the area growing at the rate of $6cm^2$ per minute. How fast is the radius increasing when the radius is 2 cms ?   5

(c) Find the maximum value of $2x^3 - 9x^2 + 12x + 5$.   5

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

ENGINEERING PHYSICS - I

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define the terms velocity and acceleration.

2. Express kinetic energy in terms of linear momentum.

3. State triangle law of vector addition.

4. What do you mean by elastic fatigue ?

5. Define simple harmonic motion. Give the differential equation for simple harmonic motion.   (5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. State and prove the law of conservation of linear momentum in the case of two colliding bodies.

2. Find out the magnitude and direction of the resultant of two forces P and Q acting at an angle θ by using the law of parallelogram of forces.

3. Explain the method of determination of coefficient of viscosity by Poiseuille's method.

4. Show that only odd harmonics are present in a closed pipe. Illustrate your answer with diagrams.

5. What are energies associated with fluid flow. Write their equations.
State Bernoulli's theorem and give the equation.

6. A couple 100 Nm acts on the shaft of a motor and rotates it at a speed of 7 revolutions per second. Calculate the power developed.

7. Calculate the wavelength of sound in air corresponding to the limits of audibility. The audible range is 20 Hz to 20000 Hz. Velocity of sound is 330 m/s.

(5×6 = 30)

[3]

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III (a) Name the seven fundamental quantities and their SI units. 3

(b) Obtain an expression for displacement of a particle during the nth second of its motion. 6

(c) Give the equations of motion for a body moving up under gravity. A stone is thrown vertically up from a bridge with an initial velocity 4.9 m/s. It strikes the water below the bridge after 2 seconds. What is the height of the bridge above the water level ? 6

OR

IV (a) State Newton's second law of motion. From the law obtain an expression for force. 6

(b) What do you mean by recoil of a gun ? Obtain an expression for the recoil velocity. A bullet of mass 0.025 kg is fired from a gun of mass 5 kg with a speed 500 m/s. Calculate the recoil velocity of the gun. 6

(c) Define impulse of a force and show that it is equal to the change in momentum. 3

UNIT — II

V (a) What are concurrent forces ? State Lami's theorem for concurrent forces. 3

(b) Define the terms resultant and equilibrant of two forces. Give the rectangular components of the force 2N acting at an angle 30° with the horizontal. 6

(c) The resultant of two forces acting at 150° is perpendicular to the smaller force. If the larger force is 3 N, find the smaller force and resultant. 6

OR

VI (a) What are the conditions for equilibrium of a body under coplanar parallel forces. 3

(b) Explain the term couple. Derive a formula for the work done by a couple. 6

(c) At the marks 30cm, 45 cm and 86 cm of a meter scale of mass 0.5 kg, weights 1 kg, 2 kg and 3 kg respectively are suspended. Where the scale should be suspended so that it remains horizontal ? 6

UNIT — III

VII (a) Define Young's modulus of a material. Give its equation and SI units. 3

(b) A mass of 25 kg is suspended at the free end of a metal wire fixed at the top. The length of the wire is 2m and its radius is 2mm. Find the elongation produced if Young's modulus is $7.5 \times 10^{10} N/m^2$. 6

(c) Distinguish between streamline flow and turbulent flow. Explain the equation of continuity for streamline flow of a liquid. 6

OR

VIII (a) What is terminal velocity ? Using Stoke's formula, obtain an expression for the terminal velocity of a sphere falling through a viscous liquid.   6

     (b) A sphere of radius 2 mm and density 1600 kg/m² falls through a liquid of density 800kg/m³ with uniform velocity 4 cm/s. Calculate the coefficient of viscosity of the liquid.   6

     (c) Discuss the variation of viscosity with temperature for gases and liquids.   3

UNIT — IV

IX (a) Give any three characteristics of stationary waves.   3

     (b) Describe the resonance column apparatus to find the velocity of sound.   6

     (c) At what temperature will the velocity of sound in air be double its value at 0° C ?   6

OR

X (a) Write a note on free vibration, forced vibration and resonance.   3

     (b) What are ultrasonic waves ? Give its two applications. Describe a method to produce ultrasonic waves.   6

     (c) The frequency of the second harmonic in an open pipe is 800Hz. If the speed of sound in air is 350m/s, find the length of the pipe.   6

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

ENGINEERING CHEMISTRY - I

[*Time* : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define nano materials. Give two examples.

2. Define alloys. Give two examples.

3. Explain conjugate acid - base pair. Give one example.

4. Define powder metallurgy.

5. List any four physical properties of water. (5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. (a) Explain positive and negative catalyst with one example for each.
   (b) Define atomic number and mass number.

2. (a) Write any four applications of carbon nano tubes.
   (b) Calculate the pH of 0.002M H_2SO_4.

3. (a) What is hard water ? Give the reason for temporary hardness of water.
   (b) Define pH scale. Write its mathematical expression.

4. (a) What is reverse osmosis ? Write any two advantages.
   (b) Define :
      (i) Basicity of acid   (ii) Acidity of base

5. (a) What is an indicator ? What are the indicators used in the following titrations ?
      (i) HNO_3 × NaOH   (ii) CH_3COOH × KOH
   (b) Hard water cannot be used for washing purposes. Give reason.

[4]

Marks

6. (a) Define the term 'sterilization' of water. Mention any two methods used for sterilization.

    (b) Write any two applications of nano materials.

7. (a) Explain the preparation of alloys by Fusion method with the help of a diagram.

    (b) Give the composition of the following :

      (i) Brass   (ii) Bronze   (5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

Unit — I

III (a) Explain any two methods for the synthesis of carbon nanotubes.   4

   (b) Explain homogeneous and heterogeneous catalysis with one example for each.   4

   (c) Give any four properties of carbon nanotubes.   4

   (d) Give three differences between atom and molecule.   3

Or

IV (a) Give the names of the three important fundamental particles present in atom. Write their absolute charge and mass.   4

   (b) What are called carbon nano tubes ? Explain the different types of carbon nanotubes.   4

   (c) Explain the terms catalytic promoter and catalytic poison with one example each.   4

   (d) Calculate the number of protons, neutron and electrons present in the following atoms.

     (i) $^{24}_{12}Mg$ (ii) $^{12}_{6}C$ (iii) $^{23}_{11}Na$ 3

Unit — II

V (a) What are buffer solutions ? How are they classified ? Write one example for each type.   4

  (b) Explain Arrhenious theory and Lewis theory of acids and bases with one example for each.   4

  (c) Write any four applications of P^H.   4

  (d) 20 ml of KOH solution was neutralized by 30ml of HCl solution of normality 0.01. Find the normality of KOH. (K=39, O=16, H=1).   3

Or

Marks

VI (a) Explain Lowry bronsted concept of acids and bases with one example for each.   4

(b) Calculate the pH of 0.001M NaOH solution.   4

(c) Define ionic product of water. Give its mathematical statement.   4

(d) Explain the following terms :

(i) Standard solution   (ii) End point   (iii) Titration   3

Unit — III

VII (a) Explain ion exchange method for the removal of permanent hardness of water.   4

(b) Give any four characteristics of potable water.   4

(c) Explain the desalination of seawater using reverse osmosis.   4

(d) Distinguish between hard and soft water.   3

Or

VIII (a) Explain with the help of a block diagram the different steps involved in the purification of water.   4

(b) Distinguish between temporary and permanent hardness of water.   4

(c) Explain the disadvantages of hard water.   4

(d) Explain any one method for the removal of temporary hardness of water.   3

Unit — IV

IX (a) Give any four physical properties of metals.   4

(b) Explain the following methods of heat treatments of steel.
(i) Annealing   (ii) Quenching
(iii) Tempering   (iv) Nitriding   4

(c) Explain the effects of any two impurities on the properties of steel.   4

(d) Give any three uses of powder metallurgy.   3

Or

X (a) Explain the steps involved in powder metallurgy.   4

(b) Give any four purposes of making alloys.   4

(c) Give any two advantages and any two limitations of powder metallurgy.   4

(d) Give a comparison of cast iron and wrought iron with respect to three physical properties.   3

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