

Answers to this Paper must be written on the paper provided separately. The time given at the head of this Paper is the time allowed for writing the answers. You will not be allowed to write during first 15 minutes. This time is to be spent in reading the question paper. Section A is compulsory. Attempt any four questions from Section B. The intended marks for questions or parts of questions are given in brackets []

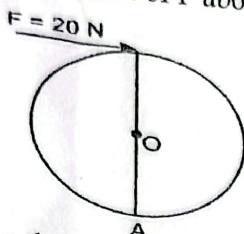
Section A - [40 marks]*(Attempt all questions)***Question 1****Choose the correct answers to the questions from the given options:**

- (i) A metal ball of mass 3 kg is lifted by 2m against the gravitational force ($g = 9.8 \text{ ms}^{-2}$). The work done in the process is
 (a) 58.8 N/m (b) $58.8 \text{ kg m}^2/\text{s}$ (c) 58.8 J (d) 29.4 J
- (ii) Liza does 600J of work in 10 minutes and Sonia does 300J of work in 20 minutes. Let the power delivered by Liza be P_1 and power delivered by Sonia be P_2 , then
 (a) $P_1 < P_2$ (b) $P_1 = P_2$ (c) $P_1 > P_2$ (d) $P_1 = 2P_2$
- (iii) The refractive index of water is $4/3$ and of glass is $3/2$. What will be the refractive index of glass with respect to water.
 (a) 1.125 (b) 1.2 (c) 1.4 (d) 1.215
- (iv) Wire that is for return of current back to the source is
 (a) fuse wire (b) earth wire (c) live wire (d) neutral wire.
- (v) 1 cal/g/c is equal to
 (a) $4.2 \times 10^3 \text{ J/kg/k}$ (b) $42 \times 10^3 \text{ J/kg/k}$ (c) 4.2 J/kg/k (d) $420 \times 10^3 \text{ J/kg/k}$
- (vi) The material used to make a calorimeter is preferably
 (a) aluminium (b) iron (c) copper (d) zinc
- (vii) On decreasing the pressure over ice its melting point
 (a) Increases (b) Remains constant (c) Decreases (d) first increases then decreases
- (viii) If a ball of mass 50 g is thrown upward with velocity 20m/s, its final kinetic energy at maximum height will be
 (a) 10J (b) 20J (c) 5J (d) none of these
- (ix) If speed of light in glass is $2 \times 10^8 \text{ m/s}$ then refractive index of glass is
 (a) 1.5 (b) 3.5 (c) 0.66 (d) 2.5
- (x) Blowing air in an open organ pipe of given length the vibrations produced in it are of frequencies in the ratio
 (a) 1:2:3:3 (b) 1:3:5:7 (c) 4: 3:6:9 (d) 1:2:3:4
- (xi) If focal length of a concave lens is 20 cm, the power of the lens will be
 (a) 5D (b) 500D (e) -5D (d) -500D $\frac{1}{2} \text{ D}$
- (xii) A simple pendulum oscillating in air executes
 (a) damped vibrations (b) natural or free vibrations
 (c) forced vibrations (d) resonant vibrations
- (xiii) Main use of uranium 235 isotope is
 (a) as fuel in atomic reactors (b) to study accumulation of charge
 (c) for medical diagnostic purpose (d) all above are correct
- (xiv) phon is the unit of
 (a) intensity of sound (b) pitch of sound (c) amplitude of sound (d) loudness of sound
- (xv) Atoms having different number of protons but same number of neutrons are called
 (a) isotopes (b) isotons (e) isobers (d) isotones and isobers

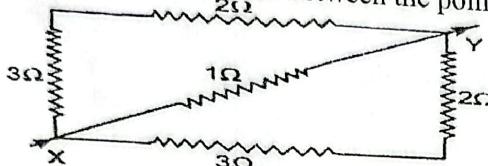
750
99
10

Question 2

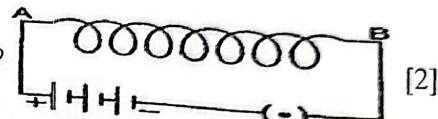
- (i) A pulley system has three pulleys. A load of 120N is overcome by applying an effort of 50N. Calculate the mechanical advantage and efficiency of this system. [3]
- (ii) A light mass and a heavy mass have equal momentum. Which will have more kinetic energy? [2]
- (iii) Two copper wires A and B are of same length, present at temperature 30 degree. Radius of A is twice the radius of B.
- Which wire has greater resistance?
 - Which wire will have greater resistivity?
- (iv) If the moment of F about the centre of a wheel O is 6Nm, calculate the moment of F about A. [2]



- (v) Can the centre of gravity be situated outside the material of the body? Give an example. [2]
- (vi) Calculate the resistance between the points X and Y in the network shown. [2]



- (vii) What is the effect of placing an iron core in the coil AB? [2]



510
2, 3

Question 3

- (i) What physical quantity does the electron volt (eV) measure? How is it related to the S.I. unit of that quantity? [2]
- (ii) Why is a fuse wire made of an alloy of lead and tin? [2]
- (iii) An object is kept at a distance of 15 cm from a convex lens of focal length 10 cm. Calculate the image distance and state the characteristics of the image formed. [2]
- (iv) Give one example, where high specific heat capacity of water is used as heat. [2]
- (v) State two advantages of an electromagnet over a permanent magnet. [2]

Section B – [40 Marks] (Attempt any four questions)

Question 4

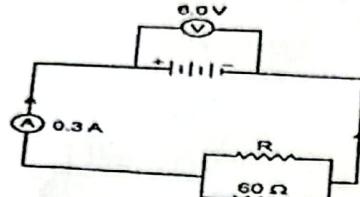
- (i) A ray of monochromatic green light enters a liquid from air as shown in the diagram angle 1 is 45° and angle 2 is 30° . [3]
-
- Find the refractive index of liquid.
 - Show in the diagram the path of the ray after it strikes the mirror and re-enters the air. Mark in the diagram the angles where ever necessary.
 - Redraw the diagram showing the plane mirror becoming normal to the refracted ray inside the liquid. State the principle used.
- (ii) Two bodies A and B have masses in the ratio 5:1 and their kinetic energies are in the ratio 125:9. Find the ratio of their velocities. [3]

3) 140
120
16

- (iii) A bucket kept under a running tap is getting filled with water. A person sitting at a distance is able to get an idea when the bucket is about to be filled. [4]
- What change takes place in the sound to give this idea?
 - What causes the change in the sound?

Question 5

- (a) Define Specific resistance of a material. State it's S.I. unit. [3]
- (b) In a three pin plug, why is the earth pin made longer and thicker than other two pins? [3]
- In the figure, the ammeter A reads 0.3A. Calculate:

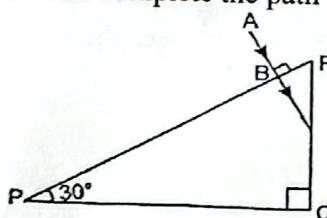


- the total resistance of the circuit
- the value of R.
- the current flowing through R.

- 200g of a solid at 100°C is dropped into copper calorimeter of mass 100g containing water weighing 150g at 40°C . [4]
- The final temperature reached is 50°C
- Calculate the specific heat capacity of solid.
- Specific heat capacity of copper is 0.4J/g/c and that of water is 4.2 J/g/c

Question 6

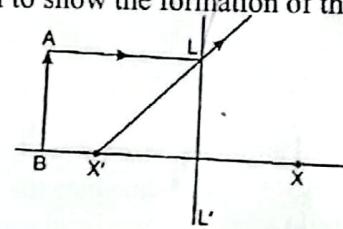
- Redraw and complete the path of the ray AB till it emerges out of the prism of critical angle 42° . [3]



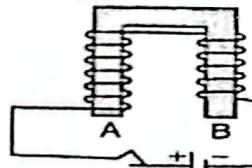
- A pond appears to be 2.7 m deep. If the refractive index of water is $4/3$, find the actual depth of the pond. [3]
- (a) What is meant by the statement the critical angle for diamond is 24° ? [4]
- (b) During the formation of VIBGYOR by a prism, name the colour which deviates the most and that deviates the least.
- Why are infrared rays used in fog conditions?

Question 7

- (a) Copy and complete the diagram to show the formation of the image of an object AB. [3]
- (b) What is the name given to x' ?



- The diagram shows a coil wound around a U shaped soft iron bar AB. [3]



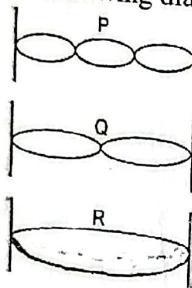
- What is the polarity induced at the ends A and B when the switch is pressed?
- Suggest One way to strengthen the magnetic field in the electromagnet.
- What will be the polarities at A and B if the direction of current is reversed in the circuit?

And an Informal Letter

- (iii) (a) A radioactive nuclear atom undergoes a series of decays according to the sequence. [4]
- $$X \xrightarrow{\beta} X_1 \xrightarrow{\alpha} X_2 \xrightarrow{\alpha} X_3$$
- If the mass number and atomic no of X_3 are 172 and 69 respectively, what is the mass number and atomic number of X ?
- (b) What is meant by radioactivity?
 (c) What is meant by nuclear waste?
 (d) Suggest one effective process for the safe disposal of nuclear waste.

Questions 8

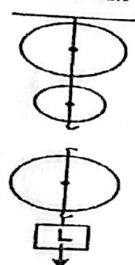
- (i) All stringed musical instruments are provided with a large and hollow sound box.
 (a) What is the purpose of making such a type of box? [3]
 (b) What kind of vibrations are produced in this sound box?
 (c) Two waves of the same pitch have amplitudes in the ratio 1:3. What will be the ratio of their frequencies?
- (ii) A lens X can form an image on the screen.
 (a) Name the lens X.
 (b) Is it possible for this lens to form magnified image?
 (c) What is the unit of power of the lens?
- (iii) The following diagram shows three different modes of vibrations P, Q and R of the same string. [4]



- (a) Which vibration will produce a louder sound and why?
 (b) The sound of which string will have maximum shrillness?
 (c) What are the factors on which the following characteristics of a musical note depend?
 1. Intensity
 2. Timber

Question 9

- (i) The diagram below shows a block and tackle system.
 (a) Copy and redraw the labelled diagram, showing the correct connection of tackle, direction of the forces involved to obtain the maximum V.R. and convenient direction.
 (b) Calculate the M.A. of this pulley system if its efficiency is 80%. [3]



- (ii) A wheel of diameter 0.5m is rotated anticlockwise by applying two forces each of magnitude 5N. Draw a diagram to show the application of forces and calculate the moment of couple applied. [3]
- (iii) State the energy changes in the following cases while in use [4]
 (a) washing machine and A solar cell
 (b) A pendulum is oscillating on either side of its rest position. Explain the energy changes that takes place in the oscillating pendulum.

*Answers to this Paper must be written on the paper provided separately**You will not be allowed to write during the first 15 minutes**This time is to be spent in reading the question paper.**The time given at the head of this Paper is the time allowed for writing the answers.**The paper has four Sections.**Section A is compulsory – All questions in Section A must be answered.**You must attempt one question from each of the Sections B, C and D and one other question from any Section of your choice.**The intended marks for questions or parts of questions are given in brackets []***Section – A***(Attempt all questions from this section)***Question 1**

Choose the correct answers to the questions from the given options.

[16]

(Do not copy the question, write the correct answers only.)

(i) What did Jessica exchange for a monkey?

- | | |
|-----------------------|---------------------------|
| (a) four score ducats | (c) three thousand ducats |
| (b) the turquoise | (d) her earring |

(ii) "Now he goes, with no less presence, but with much more love, than young Alcides,..." Who is compared to Alcides?

- | | |
|--------------|--------------|
| (a) Antonio | (c) Bassanio |
| (b) Gratiano | (d) Lorenzo |

(iii) What reason does Portia give Lorenzo to be out of Belmont?

- | | |
|---------------------------------|--|
| (a) She would go to Venice | (d) She would live with Nerissa in a monastery |
| (b) She is unhappy | |
| (c) She would meet Dr. Bellario | |

(iv) Which character in the play has least fascination for music?

- | | |
|-------------|-------------|
| (a) Jessica | (c) Portia |
| (b) Nerissa | (d) Lorenzo |

(v) What did Portia ask from Antonio as a token of remembrance?

- | | |
|----------------|--|
| (a) His ring | (c) His tie |
| (b) His gloves | (d) the three thousand ducats due unto the Jew |

(vi) What reason does Bassanio give Portia for giving away her ring to the lawyer?

- | | |
|---|--|
| (a) The lawyer compelled him to give the ring | (c) Bassanio was beset with shame and ingratitude |
| (b) The lawyer was displeased | (d) Gratiano wanted Bassanio to give away the ring |

(vii) Choose the option that lists the sequence of events in the correct order.

1. Joe sighed in relief – he realized that this meant his wife no longer resented Maggie's presence.
2. After supper, Joe went to the bedroom where Maggie lay waiting
3. Joe looked in through the window and saw Maggie in conversation with his wife Jane.
4. He entered the house noisily and Jane hurried into the kitchen to make him his supper.

- | | |
|----------------|----------------|
| (a) 1, 2, 3, 4 | (c) 1, 3, 2, 4 |
| (b) 2, 4, 1, 3 | (d) 3, 1, 4, 2 |

(viii) The first vision that the little match girl saw symbolizes:

- | | |
|----------------|---------------------------------------|
| (a) her hunger | (c) lack of warmth of love and safety |
| (b) her hope | (d) extreme cold |

- (ix) At the end of the story 'The Blue Bead', Sibia told her mother, "Something did!" What did she mean?
 (a) She killed the crocodile
 (b) She saved the Gujar woman
 (c) She found a blue bead for her necklace
 (d) She was attacked by a crocodile
- (x) What does Jesse Owens regard as his greatest Olympic prize?
 (a) winning gold in the running broad jump at Berlin Olympics
 (b) set the world record
 (c) met Hitler
 (d) friendship with Luz Long
- (xi) The children in planet Venus bullied Margot because:
 (a) she had experienced the sun which they did not
 (b) she did not like them
 (c) her parents hated the children
 (d) she loved to live in planet Venus
- (xii) "They flash upon that inward eye which is the bliss of solitude." What do they refer to?
 (a) waves
 (b) clouds
 (c) daffodils
 (d) stars
- (xiii) Why does the caged bird in the poem 'I Know Why the Caged Bird Sings' sing?
 (a) because his feet are tied and wings clipped
 (b) because he loves to sing
 (c) because he loves the free bird
 (d) because the cage motivates him
- (xiv) Select the option that shows the correct relationship between the statements (1) and (2) from 'The Patriot'.
 1. There's nobody on the housetops now.
 2. The house roofs seemed to heave and sway.
 (a) 1 is the cause of 2
 (b) 1 is a contradiction of 2
 (c) 1 is an example of 2
 (d) 1 is independent of 2
- (xv) What does Leigh Hunt, in the poem 'Abou Ben Adhem' portray?
 (a) We should love God
 (b) We should pray to God devoutly
 (c) God loves them who worship Him
 (d) God loves them who love fellowmen
- (xvi) "He gave out a cry of frustration and anguish..." Why was the athlete in the poem 'Nine Gold Medals' frustrated?
 (a) He could not participate in the game
 (b) His competitors fell down
 (c) His dreams and efforts of winning were shattered
 (d) He was the youngest of all

SECTION B

(Answer one or more questions from this section.)

DRAMA

(The Merchant of Venice by William Shakespeare)

Question 2

Read the extract given below and answer the questions that follow:

SHYLOCK: So do I answer you:

The pound of flesh, which I demand of him,
 Is dearly bought; it is mine and I will have it.
 If you deny me, fie upon your law!
 There is no force in the decrees of Venice.
 I stand for judgement; answer, - shall I have it?

- i) Where is Shylock? What wrong does he charge the Duke with? [3]
 ii) What answer does the Duke give to Shylock's question in the extract above? [3]
 iii) Who enters the scene soon? Why does the person come here? [3]
 iv) Prior to the extract, what examples does Antonio give Bassanio to prove that the hardest job is to soften the Jew's heart? [3]
 v) What does the extract reveal about Shylock's character? Do you feel sympathetic for Shylock at the end of the scene? Give reasons. [4]

Question 3

Read the extract given below and answer the questions that follow:

Lorenzo: *Sit, Jessica. Look, how the floor of heaven
Is thick inlaid with patines of bright gold:
There's not the smallest orb which thou behold'st
But in his motion like an angel sings,
Still quiring to the young-eyed cherubins;
Such harmony is in immortal souls;*

- i) Where are Lorenzo and Jessica? What sort of night is it? What, according to Lorenzo, enhances the enjoyment of music? [3]
- ii) Which Elizabethan belief does Lorenzo allude to when he refers to 'such harmony'? Why, according to him, we cannot hear the music produced by our immortal souls? [3]
- iii) How does Lorenzo explain Jessica about the great impact of music on animals? [3]
- iv) Soon, Portia enters the scene. Where had she been? Why? Whose help did she take in this endeavour? [3]
- v) 'All is well that ends well.' Give instances from the play that proves the statement. [4]

SECTION - C

(Answer one or more questions from this section.)

PROSE- SHORT STORIES

(Treasure Trove – A Collection of ICSE Poems and Short Stories)

Question 4

Read the extract from Norah Burke's short story, 'The Blue Bead' given below and answer the questions that follow:

Up out of the darkling water heaved the great reptile, water slushing off him, his livid jaws yawning and all his teeth flashing as he slashed at her leg.

The woman screamed, dropped both brass pots with a clatter on the boulder, from whence they bounced to the water, and Sibia saw them bob away in the current. Oh, the two good vessels gone.

- i) Who is referred to as 'the woman'? Why did she drop both the brass pots? What did Sibia feel at the sight of the vessels bobbing away in the current? [3]
- ii) The story unfolds that 'Sibia was born to toil'. What odd tasks did Sibia have to do? [3]
- iii) How big was the great reptile? What was the secret behind his great length? Why was he invincible? [3]
- iv) Where did Sibia live? How old was she? How was she dressed? [3]
- v) How did Sibia save 'the woman'? What did she find in the process? [4]

Question 5

Read the following extract by Jesse Owens from 'My Greatest Olympic Prize' and answer the questions that follow:

For the next few minutes we talked together. I didn't tell Long what was "eating" me, but he seemed to understand my anger, and he took pains to reassure me. Although he'd been schooled in the Nazi youth movement, he didn't believe in the Aryan-supremacy business any more than I did.

- i) Who does 'I' refer to? Which games is referred to in the story? What do these games teach us? [3]
- ii) What was 'eating' the speaker? How did Long come to know about it? [3]
- iii) What did Long advise the speaker? What was the outcome of it? [3]
- iv) How did the speaker and Luz Long perform in the finals? [3]
- v) How did Luz Long react to the speaker's performance? What does it reflect about Long's character? [4]

SECTION - D

(Answer one or more questions from this Section.)

POETRY

(Treasure Trove – A Collection of ICSE Poems and Short Stories)

Question 6

Read the following extract from the poem 'The Patriot' by Robert Browning and answer the questions that follow:

There's nobody on the house-tops now—
Just a palsied few at the windows set;
For the best of the sight is, all allow,
At the Shambles' Gate—or better yet,
By the very scaffold's foot, I trow.

- i) What is referred to as 'the best of sight'? Why? [3]
- ii) Why is there nobody on the house-tops now? What light does it throw on the attitude of the public? [3]
- iii) How is the patriot being led to the Shambles' Gate? [3]
- iv) How was the patriot welcomed a year ago? [3]
- v) Where does the patriot feel safe? What attitude of his does it reflect? What do you like in the poem? Give reasons. [4]

Question 7

Read the extract from Leigh Hunt's poem 'Abou Ben Adhem' given below and answer the questions that follow:

*Abou Ben Adhem (may his tribe increase!)
Awoke one night from a deep dream of peace,
And saw, within the moonlight in his room,
Making it rich, and like a lily in bloom,
An angel writing in a book of gold:*

- i) What does the poet mean by 'may his tribe increase'? Why does he want 'his' tribe to increase? What had made Abou Ben Adhem bold? [3]
- ii) What did Abou ask the angel? What did the angel reply? What else did Abou want to know from the angel? [3]
- iii) What made Abou speak 'more low'? What request does he make to the angel? Did the angel yield to his request? [3]
- iv) What happened the next night? [3]
- v) Give two examples of supernatural element from the extract. What does the poet try to depict through the poem? [4]

Attempt ***all*** questions from Section A and ***any four*** questions from Section B.

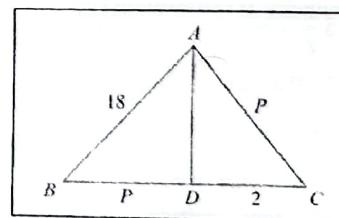
Section A: [40 Marks]

Attempt all questions from this section.

Question 1

[15]

- i) The percentage share of SGST of total GST for an Intra-state sale of an article is
 - a) 25%
 - b) 50%
 - c) 75%
 - d) 100%
- ii) The solution set of the inequation $x - 3 \geq -5, x \in \mathbb{R}$ is
 - a) $\{x : x > -2, x \in \mathbb{R}\}$
 - b) $\{x : x \leq -2, x \in \mathbb{R}\}$
 - c) $\{x : x \geq -2, x \in \mathbb{R}\}$
 - d) $\{-2, -1, 0, 1, 2\}$
- iii) If $x^2 + kx + 6 = (x-2)(x-3)$ for all values of x , then the value of k is
 - a) -5
 - b) -3
 - c) -2
 - d) 5
- iv) If x, y, z are in continued proportion then $(y^2 + z^2) : (x^2 + y^2)$ is equal to
 - a) $z : x$
 - b) $x : z$
 - c) $z : x$
 - d) $(y + z) : (x + y)$
- v) The mean and mode is given by 9 and 8 respectively. Then, the median is
 - a) $\frac{23}{3}$
 - b) $\frac{26}{3}$
 - c) 8
 - d) 9
- vi) The probability of the sun rising from the East is $P(S)$. The value of $P(S)$ is
 - a) $P(S) = 0$
 - b) $P(S) < 0$
 - c) $P(S) = 1$
 - d) $P(S) > 1$
- vii) $(\sec^2 A - 1)(1 - \operatorname{Cosec}^2 A)$ is equal to
 - a) 1
 - b) 0
 - c) 2
 - d) -1
- viii) The total surface Area of a cone whose radius is $\frac{r}{2}$ and slant height $2l$ is
 - a) $2\pi r(l+r)$
 - b) $\pi r(l+\frac{r}{4})$
 - c) $\pi r(l+r)$
 - d) $2\pi r l$
- ix) If $(x-3), (2x+1)$ and $(4x+3)$ are three consecutive terms of an AP, find the value of x .
 - a) 3
 - b) 4
 - c) 2
 - d) 1
- x) If matrix A is of order 3×2 and matrix B is of order 2×2 then the matrix AB is of order
 - a) 3×2
 - b) 3×1
 - c) 2×3
 - d) 1×1
- xi) If the line $2x + 3y = 5$ and $Kx - 6y = 7$ are parallel, then the value of K is
 - a) 4
 - b) -4
 - c) $\frac{1}{4}$
 - d) $-\frac{1}{4}$
- xii) In the following figure, if $\Delta ADB \sim \Delta ADC$ then the value of p is
 - a) 12 cm
 - b) 6 cm
 - c) 3 cm
 - d) 4 cm
- xiii) Assertion (A) : The value of n, if $a=10, d=5, a_n = 95$ is 16.
Reason (R) : The formula of general term a_n is $a_n = a + (n-1)d$.
 - a) Both (A) and (R) are true and (R) is the correct explanation of (A).
 - b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
 - c) (A) is true but (R) is false.
 - d) (A) is false but (R) is true.



- xiv) The value of $\sin 53^\circ 34'$ is
 a) .8146 b) .8043 c) .8046 d) .7146
- xv) If the length of the shadow of a tower is $\sqrt{3}$ times that of its height then the angle of elevation of the sun is
 a) 15° b) 30° c) 45° d) 60°

Question 2

- i) Mohan has recurring deposit account in a bank for 2 years at 6% per annum simple interest. If he gets Rs. 1200 as interest at the time of maturity, then find
 a) The monthly installment. b) The amount of maturity. [4]
- ii) Prove the following identities:

$$\frac{\cos A}{1+\sin A} + \tan A = \sec A$$

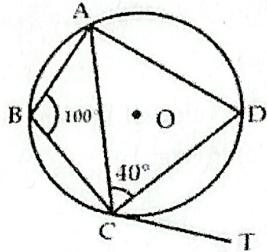
- iii) The 4th term of a G.P is 16 and the 7th term is 128. Find the first term and the common ratio of the G.P. [4]

Question 3

- i) If b is the mean proportion between a and c, show that:

$$\frac{a^4 + a^2 b^2 + b^4}{b^4 + b^2 c^2 + c^4} = \frac{a^2}{c^2}$$

- ii) In the given circle with centre O, $\angle ABC = 100^\circ$, $\angle ACD = 40^\circ$ and CT is a tangent to the circle at C. Find $\angle ADC$ and $\angle DCT$. [4]



- iii) With the help of a graph paper, taking 2 cm = 1 unit along both x and y axis. [5]
- a) Plot point A(0, 3), B(2, 3), C(3, 0), D(2, -3), E(0, -3).
 b) Reflect point B, C and D on the Y – axis and name them as B', C' and D' respectively.
 c) Write the coordinates of B', C' and D'
 d) Write the equation of line B'D'
 e) Name the figure BCDD'C'B'B

Section – B

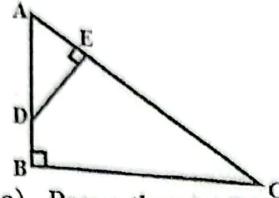
(Attempt any Four Questions from this section)

Question 4

- i) Solve the following inequation and represent your solution on the real number line. [3]
 $-5\frac{1}{2} - x \leq \frac{1}{2} - 3x \leq 3\frac{1}{2} - x, x \in \mathbb{R}$
- ii) An integer is chosen at random from 1 to 50. Find the probability that the number is [3]
 a) divisible by 5
 b) a perfect cube
 c) a prime number
- iii) Use ruler and compass only for this question. [4]
 a) Construct $\triangle ABC$, where $AB = 3.5$ cm, $BC = 6$ cm and $\angle ABC = 60^\circ$
 b) Construct the locus of point inside the triangle which are equidistant from BA and BC.
 c) Construct the locus of point inside the triangle which are equidistant from B and C.
 d) Mark the point P which is equidistant from AB, BC and also equidistant from B and C. Measure and record the length of PB.

Question 5

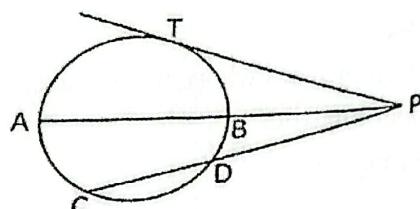
- i) If $A = \begin{bmatrix} 3 & -1 \\ 0 & 2 \end{bmatrix}$ find matrix B such that $A^2 - 2B = 3A - 5I$, where I is the identity matrix of order 2. [3]
- ii) Solve the given equation $x^2 - 3x - 9 = 0$ for x and give your answer correct to two decimal places. [3]
- iii) ABC is a right angled triangle with $\angle ABC = 90^\circ$. D is any point on AB and DE is perpendicular to AC. [4]



- a) Prove that $\triangle ADE \sim \triangle ACB$
 b) If $AC = 13$ cm, $BC = 5$ cm and $AE = 4$ cm, then find DE and AD.

Question 6

- i) The 5th term and the 9th term of an Arithmetic Progression are 4 and -12 respectively. Find: [3]
 a) The first term b) Common difference c) Sum of 16 terms of the AP
- ii) A cylindrical water tank of diameter 1.4 m and height 2.1 m is being fed by a pipe of diameter 3.5 cm through which water flows at the rate of 2 m/s. Calculate the time it takes to fill the tank. [3]
- iii) In the given figure, diameter AB and chord CD of a circle meet at P. PT is a tangent to the circle at T. $CD = 7.8$ cm, $PD = 5$ cm, $PB = 4$ cm. Find [4]
 a) AB
 b) The length of the tangent PT



Question 7

- i) Mr Mohan visits the market and buys the following articles. [3]

Items	Marked Price	Quantity	Rate of GST	Discount
Hair Oil	₹ 950	1	5%	-
Laptop bag	₹ 1000	1	18%	30%
MP4 Player	₹ 3000	1	18%	-

Find the total amount to be paid(including GST) for the above bill.

- ii) Find the mean of the following distribution by step deviation method. [3]

Class Interval	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	10	6	8	12	5	9

- iii) The model of a ship is made to a scale of 1:200 [4]

- a) If the length of the model is 4 m, find the length of the ship.
 b) If the area of the deck of the ship is 160000 m², Find the area of the deck of the model.
 c) If the volume of the model is 200 litre, find the volume of the ship in m³.

Question 8

- i) From the top of the light house 100 m high the angles of depression of two ships on opposite sides of it are 48° and 36° respectively. Find the distance between the two ships to the nearest metre. [5]
- ii) A straight line passes through the point P(-1, 4) and Q(5, -2). It intersects the coordinate axes at point A and B. M is the Mid-Point of the segment AB. Find [5]
 a) The equation of the line PQ.
 b) The Coordinates of A and B.
 c) The coordinates of M.

Question 9

- i) Use factor theorem to factorize completely:

$$x^3 - 13x - 12$$

[3]

- ii) Without using trigonometric table, evaluate.

$$\frac{\sec 17^\circ}{\cosec 73^\circ} + \frac{\tan 68^\circ}{\cot 22^\circ} + \cos^2 44^\circ + \cos^2 46^\circ$$

[3]

- iii) In a P.T display, 480 students are arranged in rows and columns. If there are 4 more students in each rows then the number of rows. Find the number of students in each row.

[4]

Question 10

- i) Using the properties of proportion, Solve for x, given $\frac{x^4+1}{2x^2} = \frac{17}{8}$

[3]

- ii) The total surface area of a circular cylinder is 462 cm^2 . If its curved surface area is one-third of its total surface area, Find the volume of a cylinder.

[3]

- iii) Draw and give for the following distribution.

[4]

Monthly income (in ₹)	600-700	700-800	800-900	900-1000	1000-1100	1100-1200	1200-1300
No. of employees	40	68	86	120	90	40	26

Hence determine:

- The median income
- The percentage of employees whose income exceeds ₹ 1180
- The lower and upper quartile.
- The inter quartile range.
