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ENGLISH — Paper ITime Allowed : $2\frac{1}{2}$ Hours]

[Maximum Marks : 100

PART - A

(Marks : 32)

- I. Answer any *three* of the following questions in about 30 words each : $3 \times 2 = 6$
1. What promise did Jo make ?
 2. When do we consider ourselves to be civilized or uncivilized ?
 3. Why did Joan want a horse and armour ?
 4. Why did Einstein become an American citizen ?
- II. Explain any *two* of the following excerpts with reference to the context : $2 \times 3 = 6$
5. 'They even carry their houses on their back'.
 6. 'I am going to walk where I like'.
 7. 'I felt like an exploded flashlight with no will to live'.
 8. 'It's not that I am so smart, it's just that I stay with problems longer'.

[Turn over

III. Answer any *two* of the following questions, each in a paragraph of about 100 words : 2 × 5 = 10

9. Describe the nesting process of Olive Ridleys and the new hatchling.
10. Describe Einstein, the Scientist.
11. Describe the finish of the race run by Bannister.
12. Highlight the character of Jo.

IV. Answer any *one* of the following questions in about 200 words : 1 × 10 = 10

13. How does Tagore compare his boyhood with that of the modern child ?
14. How did Makara's action affect the forest of Pambupatti ?

PART - B

(Marks : 27)

V. Answer any *three* of the following questions each in about 30 words :

3 × 2 = 6

15. How is joy similar to a butterfly ?
16. What does the unborn child expect out of nature ?
17. Why should we not yield to fears in the battlefield ?
18. How does the poet express his universal feeling in 'Romance' ?

VI. Answer the questions for any *two* of the following excerpts from the prescribed poems :

2 × 3 = 6

19. 'O what is that light I see flashing so clear

Over the distance brightly, brightly'.

- i) Who utters these lines ?
- ii) What was the 'flashing' due to ?
- iii) How do these lines help us, understand the poem better ?

20. " 'Twas not the car that went too fast,

But she who went too slow."

- i) Name the car mentioned here.
- ii) Who does 'she' refer to ?
- iii) Name the poem from which these lines are taken.

21. 'I will wed Truth and Power

Grant unto me Truth and Power'.

- i) Identify the figure of speech in the first line.
- ii) Who utters these lines ?
- iii) What does the poet want god to grant him ?

22. 'The two of us were chiselling

together, I and death.'

- i) Who are the 'two' ?
- ii) What was the narrator doing ?
- iii) What does the poet convey by these lines ?

VII. Answer any *two* of the following, each in about 100 words : 2 × 5 = 10

23. Write an appreciation of the poem, 'Romance'.

24. Describe the imageries in the poem, 'Say Not, the Struggle Naught Availeth' and the message conveyed by the poet.

25. Describe how the poet has beautifully brought out the message in the poem, 'Without Due Care'.

26. How is the element of suspense developed in the poem, 'O What Is That Sound' ?

VIII. 27. Quote from memory either of the following : 5

'Joy's like a Bee though few.'

OR

'For while in the light.

[Turn over

PART - C

(Marks : 18)

IX. Choose the appropriate response which conveys a similar meaning to the italicized word in the main sentence. 5 × 1 = 5

28. I am very *hardy*.

- i) She works with great difficulty.
- ii) She is a tough and robust person.
- iii) She hardly comes to school.

29. Laughing and *larking* won't pay.

- i) The Lark sings sweetly.
- ii) Do not fritter away your valuable time uselessly.
- iii) He refused to pay the bill.

30. I *glanced* at the flag again.

- i) He looked at the paper in a hurry and left at once.
- ii) He read the letter carefully for one hour.
- iii) The accountant did not look at the file.

31. Shyam *hailed* from the district of Khulna.

- i) The children threw stones at the stranger.
- ii) The people welcomed the warriors with flowers.
- iii) The refugees are originally from Rangoon.

32. Einstein has left a rich and *lasting* legacy.

- i) His happiness was short-lived.
- ii) He believes that he will live forever.
- iii) He attended the last course in NIIT.

- X. Choose the response opposite in meaning to the italicized words/phrases from the *four* alternatives given with each sentence. 5 × 1 = 5

33. Makara would not *give in*.

- | | |
|--------------|------------|
| i) surrender | ii) yield |
| iii) revolt | iv) argue. |

34. Liberty is an *accommodation* of interests.

- | | |
|----------------|---------------|
| i) acceptance | ii) inclusion |
| iii) rejection | iv) infusion. |

35. The crowd was *roaring*.

- | | |
|---------------|--------------|
| i) cheering | ii) shouting |
| iii) clapping | iv) silent. |

36. When material is in *profusion*, the mind gets lazy.

- | | |
|-----------------|-----------------|
| i) abundance | ii) luxuriance |
| iii) generosity | iv) sparseness. |

37. I have the *honour* to be your steward.

- | | |
|---------------|----------------|
| i) goodness | ii) insult |
| iii) disgrace | iv) stupidity. |

- XI. Use any *two* of the following words in sentences of your own : 2 × 1 = 2

38. reasonable

39. peculiarity

40. confronted.

- XII. Use any *two* of the following phrases in sentences of your own : 2 × 1 = 2

41. familiar with

42. on the edge of

43. dispose of.

- XIII. Fill in the blanks, choosing the right alternatives given in the brackets :

2 × 1 = 2

44. One should not (*remain/remind*) idle.

45. A rolling stone gathers no (*moss/mass*).

[Turn over

- XIV. a) Use one word for the phrasal verb or idiom italicized in either of the following sentences : 1

46. The house built on the roadside was *pulled down*.

OR

Monisha has *put on* a new dress today.

- b) Use a phrasal verb or an idiom in the place of the italicized word in either of the following sentences : 1

47. The cricket match was *cancelled* due to the heavy rain.

OR

You must *reduce* your expenditure.

PART - D

(Marks : 23)

- XV. Rewrite as directed. Marks are indicated against each item :

48. Despite his poverty, he was happy.

(Change into a *Complex sentence*) 1

OR

Her ardent faith in god has put fire into me.

(Change into a *Compound sentence*)

49. It is too heavy for me to lift.

(Change into a *Complex sentence*) 1

OR

When we heard the news we jumped in joy.

(Change into a *Simple sentence*)

50. A letter is delivered by the postman. (Change the *voice*) 1

OR

Give the order. (Change the *voice*)

51. No other continent is as small as Australia.

(Rewrite using *Comparative degree*)

1

OR

Gold is more expensive than silver.

(Rewrite using *Positive degree*)

52. The Taj Mahal is a wonderful monument.

(Change into an *Exclamatory sentence*)

1

OR

We can't finish the work now.

(Supply a *Question tag*)

53. There was war. Einstein could work undisturbed.

(Combine into a *Simple sentence*)

1

OR

Kalpana is rich. She is not happy.

(Combine into a *Complex sentence*)

54. Who is tallest, you or I ?

(Correct the sentence)

1

55. Identify the types of clauses in the given sentence :

2

Nesting which always occurs at night takes between 45 minutes to an hour.

[Turn over

56. Fill in the blanks with appropriate articles :

$$4 \times \frac{1}{2} = 2$$

..... hatchlings are kept in open in basket
for hour or so.

57. Fill in the blanks with appropriate prepositions :

$$4 \times \frac{1}{2} = 2$$

Laurie dug a grave the ferns the grove and Pip
was laid many tears his mistress.

58. He said, "I have no special gifts. I am only passionately curious."

(Rewrite in the Reported form of speech)

2

OR

He said that he had decided that they did not need the tortoises.

(Rewrite in the Direct form of speech)

59. mercy on us what happened cried jo

(Punctuate the sentence)

2

60. Fill in the blanks with the correct tense forms of the verbs given in
brackets :

$$3 \times 1 = 3$$

At the age of five, when Albert (be) sick in bed, his father
..... (bring) him a device that (stir) his intellect.

61. No, I won't be able to complete this work.

(Frame a suitable question)

1

OR

Ruskin Bond wrote this story.

(Frame a 'Wh' question)

62. Identify the sentence pattern :

1

The nurse gave Meena an injection.

63. Frame a sentence on the given pattern :

1

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ENGLISH — Paper II

Time Allowed : $2\frac{1}{2}$ Hours]

[Maximum Marks : 100

PART - A

- I. Rearrange the following sentences in logical sequence and rewrite in a paragraph using connectors wherever necessary : 5 + 5

1. He pretended to be falling asleep.
2. Young seagull was alone.
3. Nobody had come near him in the past twenty four hours.
4. His mother was tearing at a piece of fish.
5. His brother and sister had flown away.

- II. Read the given passage and answer the questions given below in a sentence or two each :

The same time the sound was heard once again. The principal got up and went towards the bed near door. Undoubtedly the noise was from the other side of the door.

"Who is there ?" the principal asked raising his voice. A few heads looked at him from the beds. In a swift move the principal went to a window near the rear door negotiating his way through the beds, gently opened the window and peered into the darkness. Nothing was visible. After a few minutes his eyes got adjusted to the darkness and he saw the silhouette of the rear portion of an animal. He switched on the flash light.

"Good God !"

"What happened Sir ?" Curious voices of the few students were heard. "Sh Sh" The principal asked them to be silent and whispered "Nothing to worry. It seems we have a visitor. It is a black bear."

1. Where did the noise come from ? 2
2. What did the principal do ? 2
3. What did he see through the window ? 2
4. Why was nothing visible at first ? 2
5. How did he find the visitor ? Who was it ? 2

- III. Answer any *two* of the following in an essay form within 200 words each :

$2 \times 10 = 20$

1. Write about the role of the principal in the story, 'The Missed Encounter'.
2. Justify the title, 'Stolen banana' relating it to the story.
3. Narrate the encounter of the author Sudha Murthy with the tribal people.
4. Narrate how Sivagami was able to bring about a change in her father's attitude.

[Turn over

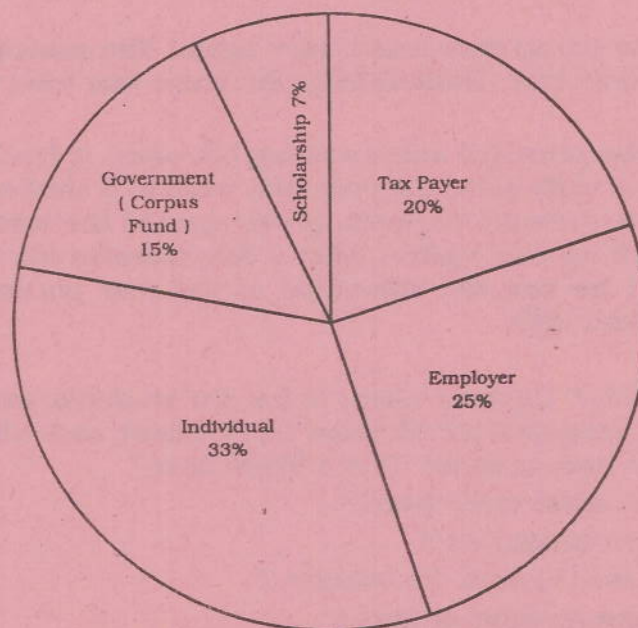
PART - B

- IV. Write a précis of the following passage reducing it to one-third of its length : 10

Trees are useful to man in three ways : they provide him with wood and other products, they give him shade and they help to prevent drought and flood. Unfortunately, in many parts of the world, man has not realised that the third of these services is the most important. In this eagerness to draw in large numbers government realises the importance of a plentiful supply of trees. It is difficult for it to persuade the villagers to see this. The villagers want wood to cook their food with; and can earn money by making charcoal or selling wood to the townsmen. They are usually too lazy or careless to plant and look after new trees. So, unless the government has a good system of control, or can educate the people, the forests will slowly disappear. This does not mean the villagers' sons and grandsons have fewer trees.

The results are even more serious : for where there are trees, their roots break the soil allowing the rains to sink in and also bind the soil thus preventing its being washed away easily; but where there are no trees the rain falls on hard ground and carries away the rich top-soil. Nothing remains but worthless desert.

- V. Study the diagram given below and answer the following questions : 5

**Questions :**

1. How many per cent more does the tax payer give compared to government ?
2. Who pays the major share ?
3. Whose contribution nears that of the individual ?
4. Which item gives the minimum ?
5. What is the contribution of the government corpus fund ?

OR

Read the following passage and make notes :

Birds have many shapes and sizes of wings. The type of wings depends on the way the bird lives and needs to be able to fly. People have tried to copy the birds. What sort of a flying the wings are designed to ? Long wings are best for gliding. Most seagulls have long slim wings and can glide across the seas and oceans for hundreds of kilometres. The bird albatross glides so well that it can sleep well while flying. Short wings let a bird twist and turn sharply. Birds like the kingfisher have short wings as they twist and turn among the branches of trees and swoop and dive for fishes in the rivers. Wide wings are best for soaring. Eagles have this type of wings.

- VI. Rewrite each of the following sentences correctly : 5 × 1 = 5
1. I prefer coffee than tea.
 2. Ganges is a sacred river.
 3. He came to school by walking.
 4. Each of us have a duty to perform.
 5. He said that he lost his father when he is young.
- VII. Read the following poem and answer the questions given below : 10

We all are born innocent,
 Sweet as summer night,
 Unprejudiced and kind,
 All we know is right
 But a child's innocence fades away,
 Something has stolen their light,
 Their captor is as old as time.
 Brutally strong but with no sight,
 The world has stolen our innocence,
 This blind expanse of land,
 Its cities and its people,
 Can't seem to take a stand,
 We become corrupt and heartless,
 And never hold out a hand,
 To an adult who has kept their innocence,
 We just don't understand.

Questions :

1. Are children innocent by birth ?
2. What are the attributes of innocence ?
3. Do children maintain their innocence ?
4. Who steals the innocence of the children ?
5. Who do the children blame for the loss of their innocence ?

OR

[Turn over

Paraphrase the poem given below :

Here's an example from
A Butterfly ;
That on a rough, hard rock
Happy can lie;
Friendless and all alone
On this unsweetened stone.
Now let my bed be hard
No care take I:
I'll make my joy like this
Small Butterfly;
Whose happy heart has power
To make a stone a flower.

VIII. (Sign yourself as X. If you write your Name, Reg. No. or Address your answer paper will not be valued)

1. Write a letter to your cousin explaining what made you opt for the science group in your Higher Secondary Course. 10

OR

2. Write a letter to the postmaster complaining about the late delivery of letters in your area.

OR

3. Write a letter to the manager of Oxford University Press, Chennai, requesting him to send ten copies of "Advanced Learner's English Dictionary".

IX. Build up a dialogue between a Lady and a Shopkeeper regarding the purchase of a washing machine. 5

OR

Complete the dialogue with at least *five* exchanges :

Father : Venkat ! Show me your progress card.

Venkat : Here it is father.

Father :

X. Read the given passage and prepare an attractive advertisement : 5

There is an opening of a garment shop in a residential area which includes toys for children too with 25 per cent discount.

Contact No. 20214572

No : 16, City Centre Plaza,

T. T. K. Road, Chennai-2.

XI. Expand the idea contained in the following statement in about 100 words : 10

Many a drop make an ocean.

OR

All that glitters is not gold.

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MATHEMATICS — Paper I

Time Allowed : $2\frac{1}{2}$ Hours]

[Maximum Marks : 100

PART - I

SECTION - A

Answer all questions.

20 × 1 = 20

I. Choose the correct answer from the given alternatives :

1. For an A.P. $S_n = n^2 - n + 1$. The second term of the series is

1) 2

2) 3

3) 4

4) -2.

2. The number of terms in the A.P. 7, 13, 19, , 97 is

1) 97

2) 17

3) 16

4) 15.

3. A radioactive sample decays and the remaining sample at infinite time is given by $b = 1 - \left(\frac{1}{2} + \frac{1}{4} + \dots \text{to } \infty \right)$, then b is

1) 0

2) 1

3) $\frac{1}{\sqrt{2}}$

4) $\frac{1}{2}$.

[Turn over

10. If $f : X \rightarrow Y$, where $X = \{ 1, 2, 3, 4 \}$, $Y = \{ 5, 6 \}$ is given by $f = \{ (1, 5), (2, 5), (3, 6), (4, 6) \}$, then f is a
- 1) one-one function 2) many-one function
3) constant function 4) one-one onto function.
11. If $g(x) = x^2$; $h(x) = 2x + 1$ then $g \circ h$ is
- 1) $2x^2 + 1$ 2) $2x + x^2$
3) $(2x + 1)^2$ 4) $(2x)^2 + 1$.
12. If $\{ (4, 5), (5, x) \}$ represents a constant function then the value of x is
- 1) 3 2) 4
3) 5 4) 6.
13. A recurring deposit of Rs. 50 per month at 10% S.I. per annum will fetch at the end of 2 years an interest of
- 1) Rs. 250 2) Rs. 125
3) Rs. 375 4) Rs. 500.
14. The quarterly interest due on Rs. 1000 at 12% rate of interest is
- 1) Rs. 120 2) Rs. 40
3) Rs. 30 4) Rs. 60.
15. If the difference between C.I. and S.I. on Rs. 2800 for 2 years is Rs. 7, then the rate of interest is
- 1) 8% 2) 20%
3) 10% 4) 5%.

[Turn over

16. If $3x + 2$ is a factor of $p(x)$, then

1) $p\left(\frac{2}{3}\right) = 0$

2) $p\left(\frac{3}{2}\right) = 0$

3) $p\left(\frac{-2}{3}\right) = 0$

4) $p\left(\frac{-3}{2}\right) = 0$.

17. If one root of the equation is the reciprocal of the other root in

$$ax^2 + bx + c = 0, \text{ then}$$

1) $a = c$

2) $a = b$

3) $b = c$

4) $c = 0$.

18. The partial fraction representation of $\frac{x}{(x+1)^2}$ is

1) $\frac{A}{(x+1)}$

2) $\frac{A}{(x+1)} + \frac{B}{(x+1)^2}$

3) $\frac{Ax+B}{(x+1)^2}$

4) $\frac{Ax+B}{x+1} + \frac{Cx+D}{(x+1)^2}$.

19. The H. C. F. of $2(x^2 - 4)$ and $4(x^2 - 9)(x+2)$ is

1) $4(x^2 - 4)$

2) $(x-2)(x^2 - 9)$

3) $2(x+2)$

4) $2(x^2 - 9)(x+2)$.

20. $\frac{a^2}{a^2 - b^2} + \frac{b^2}{b^2 - a^2} =$

1) $a - b$

2) $a + b$

3) $a^2 - b^2$

4) 1.

SECTION - B

II. Answer any ten questions :

 $10 \times 2 = 20$

21. For what value of n , the n th term of the series $3 + 10 + 17 + \dots$ and $63 + 65 + 67 + \dots$ are equal ?

22. Which term of the progression $1, 2, 4, 8, \dots$ is 512 ?

23. Evaluate :

$$26 + 27 + \dots + 65.$$

24. The volume of a cylinder is 448π cu. cm and height 7 cm. Find its curved surface area.

25. Two cones have their heights in the ratio $5 : 3$ and the radii of their bases in the ratio $2 : 1$. Find the ratio of their volumes.

26. 8 metallic spheres each of radius 2 cm are melted and cast into a single sphere. Calculate the radius of the new sphere.

27. Given $f(x) = 3x - 2$, $g(x) = kx + 3$; find k so that $f \circ g = g \circ f$.

28. Given $A = \{-8, -7, -5, 1, 2, 4\}$; $B = \{-7, 1, 3, 4, 5, 6\}$; $C = \{-8, -5, 2, 4, 6, 7\}$. Find $A - (B \cup C)$.

29. Let $A = \{0, 1, 2, 3\}$; $B = \{1, 2, 5, 10, 16\}$ and $f = \{(x, y); y = x^2 + 1, x \in A \text{ and } y \in B\}$. List the elements of f and identify the function.

30. The difference between S.I. & C.I. for 2 years on a sum of money lent at $6\frac{2}{3}\%$ is Rs. 14. Find the sum.

[Turn over

31. Swamy deposited Rs. 3000 in a bank as a fixed deposit for 2 years paying 10% p.a. and receives interest half yearly. Find the interest received by him in 2 years.
32. For what value of m is $2x^3 - x^2 - 3mx - 24$ exactly divisible by $x - 2$?
33. Given $p(x - 1) + q(x - 3) = 5x - 9$; find the values of p and q .
34. If α and β are the roots of the equation $3x^2 - 6x + 4 = 0$, find the value of $\alpha^2 + \beta^2$.
35. The sum of a number and its reciprocal is $2\frac{1}{30}$. Find the number.

PART - II

SECTION - C

- III. Answer any *two* questions : 2 × 5 = 10
36. Find four numbers in A.P. whose sum is 20 and the sum of whose squares is 120.
37. If S_1, S_2, S_3 be the sum to $n, 2n$ and $3n$ terms respectively of an A.P., show that $S_3 = 3(S_2 - S_1)$.
38. Find the 5th term of the G.P. whose 3rd term is $\frac{3}{8}$ and 7th term is $\frac{3}{128}$.

SECTION - D

- IV. Answer any *three* questions : 3 × 5 = 15
39. Using Venn Diagram verify $A - (B \cup C) = (A - B) \cap (A - C)$.
40. If $A = \{-3, -1, 1, 3\}$, $B = \{0, 1, 2, 3, 4\}$ and $f : A \rightarrow B$ is defined by $f(x) = \frac{3-x}{2}$, represent the function as
- i) an arrow diagram
 - ii) a set of ordered pairs
 - iii) a table
 - iv) a graph.

41. Seba deposited Rs. 14,000 as a special deposit for 3 years and the interest was compounded yearly at the rate of 10% p.a. Find the maturity value of the deposit.
42. Sita invests Rs. 25 in a bank at the beginning of each month for 36 months. If she gets Rs. 1066.50 at the end of 36 months, find the rate of interest.

SECTION - E

V. Answer any *two* questions :

2 × 5 = 10

43. Through a cylindrical tunnel of diameter 21 m water flows uniformly at the rate of 18 km per hour. How much water will flow through it in 20 minutes ?
44. Find the capacity of a bucket having the radius of the top as 36 cm and that of the bottom as 12 cm. Its depth is 35 cm.
45. A hemispherical bowl has volume of material $\frac{122\pi}{3}$ c.c. Its external diameter is 10 cm. Find its thickness.

[Turn over

SECTION - F

VI. Answer any *three* questions : $3 \times 5 = 15$

46. R_1 and R_2 are the remainders when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ are divided by $x + 1$ and $x - 2$ respectively. If $2R_1 + R_2 = 6$, find the value of a .
47. Decompose into partial fractions : $\frac{x}{(x+1)(x+2)(x+3)}$.
48. If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square, find the values of a and b .
49. If α and β are the roots of the equation $x^2 - 3x - 4 = 0$, form the equation whose roots are $\frac{1}{\alpha^2}, \frac{1}{\beta^2}$.

PART - III

SECTION - G

VII. Answer any *one* question : $1 \times 10 = 10$

50. Solve graphically $x^2 - 5x + 6 = 0$.
51. Draw the graph of $y = x^2 + 2x - 3$ and hence solve the equation $x^2 - x - 6 = 0$.
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MATHEMATICS — Paper IITime Allowed : $2\frac{1}{2}$ Hours]

[Maximum Marks : 100

PART - I**SECTION - A**

Note :

(i) Answer all the questions.

(ii) Choose the correct answer from the given alternatives : $20 \times 1 = 20$ 1. If A and B are two matrices which satisfy $A + B = B$, then A is

1) row matrix

2) column matrix

3) null matrix

4) diagonal matrix.

2. If $A = \begin{bmatrix} 1 & -1 & 3 \\ 2 & 0 & 6 \end{bmatrix}$ then the element a_{12} is

1) 3

2) 2

3) -1

4) 0.

3. If $(-1 \ -2 \ 4) \begin{pmatrix} 2 \\ a \\ -3 \end{pmatrix} = (-10)$ then the value of a is

1) 2

2) -4

3) 4

4) -2.

[Turn over

4. Two circles with radii a and b touch each other externally. Let c be the radius of the third circle which touches these two circles as well as a common tangent to the two circles. Then $\frac{1}{\sqrt{c}}$ is

1) $\frac{1}{\sqrt{a}} - \frac{1}{\sqrt{b}}$

2) $\frac{1}{\sqrt{a} + \sqrt{b}}$

3) $\frac{1}{\sqrt{a} - \sqrt{b}}$

4) $\frac{1}{\sqrt{a}} + \frac{1}{\sqrt{b}}$

5. ABT is a secant of a circle which intersects the circle at A and B and PT is a tangent to the circle at P . If $PT = 5$ cm and $BT = 2.5$ cm then AB is

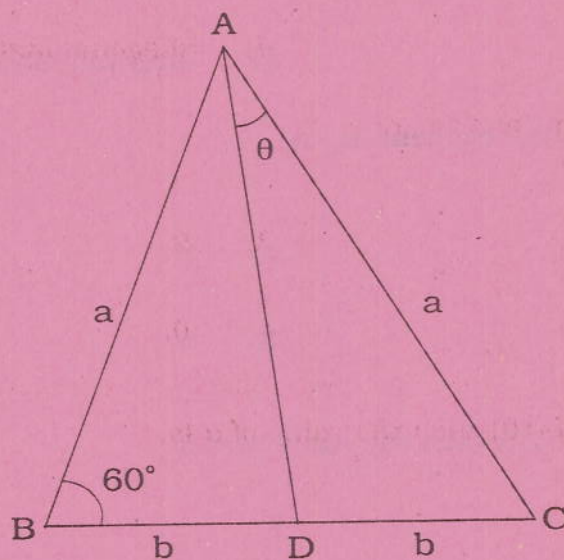
1) 10 cm

2) 7.5 cm

3) 5 cm

4) 25 cm.

6. In the figure θ is



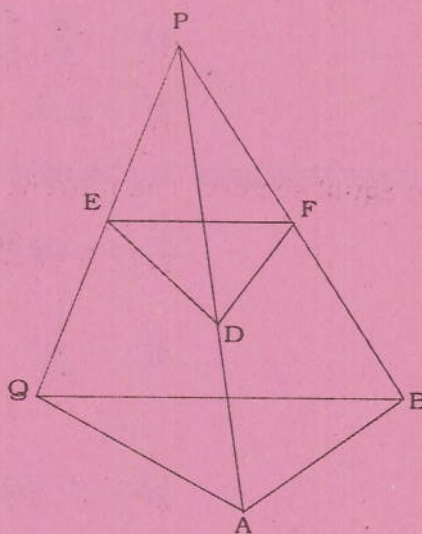
1) 60°

2) 45°

3) 30°

4) 15°

7. In the figure if $DE \parallel AQ$, $DF \parallel AB$, $PE = 2$ cm, $EQ = 5$ cm and $PF = 4$ cm then PB is



- 1) 1.6 cm 2) 10 cm
 3) 14 cm 4) 7 cm.
8. If the lengths of the corresponding sides BC and QR of two similar triangles ABC and PQR are respectively 6 cm and 10 cm then the ratio of the areas of ΔABC and ΔPQR is
- 1) 3 : 5 2) 9 : 25
 3) 25 : 9 4) 5 : 3.
9. The area of a triangle formed by the points $(0, 4)$, $(4, 0)$ and origin is
- 1) 8 sq. units 2) 16 sq. units
 3) 2 sq. units 4) 4 sq. units.
10. If $\theta = 60^\circ$ is the angle made by the line with x -axis in the positive direction, the slope of the line is
- 1) 0 2) $\frac{1}{\sqrt{3}}$
 3) $\sqrt{3}$ 4) 1.
11. If lines $ax - 5y = 5$ and $2x + y = 1$ are perpendicular then the value of a is
- 1) 2 2) $\frac{5}{2}$
 3) $\frac{2}{5}$ 4) $\frac{1}{2}$.
12. The lines $y = -3$ and $x = 8$ meet at the point
- 1) $(-8, -3)$ 2) $(3, 8)$
 3) $(-3, 8)$ 4) $(8, -3)$.

[Turn over

13. The x and y intercepts on the line $2x - 3y + 5 = 0$ on the axes are

1) $\frac{2}{5}, \frac{3}{2}$

2) $\frac{-5}{2}, \frac{5}{3}$

3) 2, 5

4) 5, 1.

14. A circle is divided into n equal sectors. The tangent of each angle at the centre is

1) $\tan(n)$

2) $\tan\left(\frac{360^\circ}{n}\right)$

3) $\sqrt{3}$

4) $\frac{1}{\sqrt{3}}$.

15. $35^\circ - 30^\circ 17' 20''$ is

1) $65^\circ 17' 20''$

2) $4^\circ 42' 40''$

3) $5^\circ 43' 40''$

4) $6^\circ 42' 40''$.

16. $\sin^2 \frac{\pi}{3} + \sin^2 \frac{\pi}{6}$ is

1) 1

2) 2

3) $\frac{1}{\sqrt{3}}$

4) $\frac{3}{2}$.

17. $\frac{\sqrt{\operatorname{cosec}^2 15^\circ - 1}}{\operatorname{cosec} 15^\circ}$ is

1) $\sin 15^\circ$

2) $\cos 15^\circ$

3) $2 + \sqrt{3}$

4) $\frac{-1 - \sqrt{2}}{2}$.

18. When the angle of elevation of the sun is 45° , the length of the shadow of a tower of height 10 m is

1) 10 m

2) $10\sqrt{3}$ m

3) $\frac{10}{\sqrt{3}}$ m

4) $\frac{1}{\sqrt{3}}$ m.

19. The range of the first 20 odd natural numbers is

1) 38

2) 40

3) 19

4) 39.

20. The probability of a sure event is

1) 1

2) 100

3) 0

4) 0.1.

SECTION - B

Note : Answer any ten questions.

10 × 2 = 20

21. Construct a 3×2 matrix whose elements are given by $a_{ij} = \frac{3i-j}{2}$.
22. If $A = \begin{bmatrix} 3 & 7 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 2 \\ 4 & -1 \end{bmatrix}$, find the matrix C if $2C = A + B$.
23. The sides of a ΔPQR are 8 cm, 10 cm and 12 cm. Three circles are drawn with centres P , Q and R each one touching the other two externally. Determine the radii of the circles.
24. If D and E are respectively the points on the sides AB and AC of a triangle ABC such that $AD = 3$ cm, $DB = 4.5$ cm, $AE = 4$ cm and $EC = 6$ cm, then show that $DE \parallel BC$.
25. ΔABC and ΔDEF are similar. The area of ΔABC is 16 sq. cm and that of ΔDEF is 25 sq. cm. If $EF = 4$ cm, find BC .
26. The area of the triangle whose vertices are $(2, 3)$, $(6, -2)$, $(-2, a)$ is 6 sq. units. Find a .
27. Find p if the slope of a line joining $(-5, 15)$ and $(4, p)$ is $-\frac{1}{9}$.
28. Calculate the slope and y -intercept of the line $2x - 3y + 1 = 0$.
29. Find the equation of the line through the intersection of the lines $3x + 2y = 8$, $5x - 11y + 1 = 0$ and parallel to the line $6x + 13y = 5$.
30. Prove that $(\sec \theta + \tan \theta)(1 - \sin \theta) = \cos \theta$.

[Turn over

31. Evaluate $\frac{2 \sec \phi}{1 - \tan^2 \phi}$ when $\cos \phi = \frac{\sqrt{3}}{2}$.
32. Solve the triangle ABC in which $\angle A = 25^\circ 30'$, $\angle B = 90^\circ$ and $AB = 10$ cm.
33. A kite is flying at a height of 75 m from the level ground, attached to a string inclined at 60° to the horizontal. Find the length of the string.
34. The variance of 5 values is 36. If each value is doubled then find the standard deviation of the new values.
35. A coin is tossed twice. Find the probability of getting exactly one head.

PART - II

SECTION - C

Note : Answer any *two* questions.

$2 \times 5 = 10$

36. Prove that if two triangles are equiangular to one another then the two triangles are similar.
37. In a right triangle PQR , the perpendicular QT on the hypotenuse PR is drawn. Prove that
- i) $PR \times PT = PQ^2$
- ii) $PR \times TR = QR^2$
38. If the bisector of an angle of a triangle bisects the opposite side, prove that the triangle is isosceles.

SECTION - D

Note : Answer any three questions.

3 × 5 = 15

39. Solve : $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$.

40. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, show that $A^2 - 5A - 2I_2 = 0$.

41. A number is selected at random out of first 100 natural numbers. What is the probability that it is either a multiple of 11 or 13 ?

42. Find the S. D. of the following :

x	6	9	12	15	18
f	7	12	13	10	8

SECTION - E

Note : Answer any two questions.

2 × 5 = 10

43. Find x from the following equation :

$$\tan^2 45^\circ - \cos^2 60^\circ = x \cdot \sin 45^\circ \cos 45^\circ \cot 30^\circ$$

44. Prove that $\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta} = 1 - 2 \sec\theta \tan\theta + 2 \tan^2\theta$.

45. From the top and bottom of the tower, the angles of elevation of the top of a cliff with height 400 m are observed to be 30° and 60° . Determine the height of the tower.

[Turn over

SECTION - F

Note : Answer any *three* questions.

$3 \times 5 = 15$

46. Show that the points $(4, 8)$, $(-4, 0)$, $(-3, 1)$, $(-7, -3)$ are collinear.
47. $A(4, 1)$, $B(7, 4)$ and $C(5, -2)$ are the vertices of ΔABC . Find the equation of the altitude through A .
48. The lines $2x + 5y - 25 = 0$ and $5x + 4y - 20 = 0$ are diameters of a circle. Find the radius of the circle which passes through the point $(3, 4)$.
49. Obtain the equation of the line which passes through the origin and is concurrent with the lines $x - y - 4 = 0$ and $7x + y + 20 = 0$.

PART - III**SECTION - G**

Note : Answer any *one* questions.

$1 \times 10 = 10$

50. Draw a circle of diameter 9 cm. Take a point A on it. Using the centre of the circle, draw a tangent to the circle at the point A .
51. Construct a triangle ABC , such that $AB = 7$ cm, $m\angle C = 60^\circ$ and the bisector of $\angle C$ meets AB at a point D where $AD = 2$ cm. Measure the length of the median from C .
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