

**MATHEMATICS, Paper - II**

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

**Instructions :**

1. Read all questions. 15 minutes of time is allotted exclusively for reading the Question Paper and 2.30 hours for writing the answers.
2. **Part - A** answers should be written in separate answer book.
3. There are **three** sections in **Part-A**.
4. Answer **all** questions.
5. Every answer should be written visibly and clearly.
6. There is internal choice in section - III.

**Part - A**

Time : 2 hours

Marks : 30

**SECTION - I**

(Marks : 4×1=4)

- Note :**
- (i) Answer **all** the questions.
  - (ii) Each question carries 1 mark.

1. In  $\triangle ABC$ ,  $LM \parallel BC$  and  $\frac{AL}{LB} = \frac{2}{3}$ ,  $AM = 5$  cm, find  $AC$ .
2. Evaluate  $\sin 15^\circ \cdot \sec 75^\circ$ .

3. A box contains 3 blue and 4 red balls. What is the probability that the ball taken out randomly will be red?

4. The mean for a grouped data is calculated by  $\bar{x} = a + \frac{\sum f_i d_i}{\sum f_i}$

What do the terms ' $f_i$ ' and ' $d_i$ ' represent in the above formula?

**SECTION - II**

(Marks :  $5 \times 2 = 10$ )

**Note :** (i) Answer **all** questions.

(ii) Each question carries 2 mark

5. If the distance between two points  $(x, 1)$  and  $(-1, 5)$  is '5', find the value of 'x'.

6. Find the length of the tangent from a point 13 cm away from the centre of the circle of radius 5 cm.

7. If  $\cos A = \frac{7}{25}$ , then find  $\sin A$  and  $\operatorname{cosec} A$ .

What do you observe?

8. Rehman observed the top of a temple at an angle of elevation of  $30^\circ$ , when the observation point is 24 m. away from the foot of the temple. Find the height of the temple.

9. Write mid-values of the following frequency distribution.

Class interval	8-11	12-15	16-19	20-23	24-27	28-31	32-35
Frequency	4	4	5	13	20	14	8

16E(A)

**B**

- Note :**
- (i) Answer **all** the questions.
  - (ii) Choose any **one** from each question.
  - (iii) Each question carries **4** marks.

10. (a) Prove that  $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$ .

**OR**

- (b) ABC is a right angled triangle, right angled at C. Let  $BC = a$ ,  $CA = b$ ,  $AB = c$  and let  $p$  be the length of perpendicular from C on AB.

Prove that (i)  $pc = ab$  and (ii)  $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$ .

11. (a) Find the median of the following data.

Class interval	11-15	16-20	21-25	26-30	31-35	36-40
Frequency	3	5	9	12	7	4

**OR**

- (b) In what ratio, does the point  $(-4, 6)$  divide the line segment joining the points  $A(-6, 10)$  and  $B(3, -8)$ ?

12. (a) Two dice are thrown at the same time. What is the probability that the sum of two numbers appearing on the top of the dice is (a) 10, (b) less than or equal to 12, (c) a prime number, (d) multiple of '3'?

**OR**

- (b) A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground by making  $30^\circ$  angle with the ground. The distance between the foot of the tree and the top of the tree on the ground is 6 m. Find the height of the tree before falling down.

13. (a) Construct a triangle PQR, where  $QR = 5.5$  cm,  $\angle Q = 65^\circ$  and  $PQ = 6$  cm. Then draw another triangle, whose sides are  $\frac{2}{3}$  times of the corresponding sides of  $\triangle PQR$ .

OR

- (b) Draw a circle of radius 4 cm and draw a pair of tangents to the circle, which are intersecting each other 6 cm away from the centre.



16E(B)

**MATHEMATICS, Paper - II**

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

**Instruction :** Write the answers to the questions in this **Part-B** on the Question paper itself and attach it to the answer book of **Part-A**.

**Part B**

Time : 30 minutes

Marks : 10

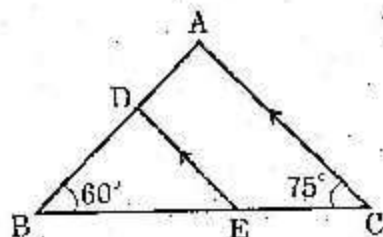
**SECTION - IV**

(Marks :  $20 \times \frac{1}{2} = 10$ )

**Note :**

- (i) Answer **all** the questions.
- (ii) Each question carries  $\frac{1}{2}$  mark.
- (iii) Marks will **not** be awarded in any case of over-written, rewritten or erased answers.
- (iv) Each question has four options. Write the **CAPITAL LETTERS** (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.

14. In the figure,  $\angle BDE = \dots$  [   ]



(A)  $45^\circ$

(B)  $65^\circ$

(C)  $75^\circ$

(D)  $60^\circ$

16E(B)

**B**

[11]

15.  $\cos 60^\circ + \sin 30^\circ$  value is .... [   ]
- (A)  $\frac{\sqrt{3}}{2}$  (B) 1  
(C)  $\cos 90^\circ$  (D) B and C
16. X-coordinate of intersecting point of two ogives, represents .... [   ]
- (A) Mean (B) Median  
(C) Range (D) Mode
17. Centroid of a triangle, whose vertices are  $(-a, 0)$ ,  $(0, b)$  and  $(a, 0)$  is ... [   ]
- (A)  $(a, b)$  (B)  $(\frac{a}{3}, 0)$   
(C)  $(0, \frac{b}{3})$  (D)  $(\frac{a}{3}, \frac{b}{3})$
18. The formula to find the area of a triangle is ..... [   ]
- (A)  $\Delta = \frac{1}{2}bh$  (B)  $\Delta = \sqrt{(s-a)(s-b)(s-c)}$   
(C)  $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$  (D) A and C
19. The theorem applied to divide the line segment in the given ratio is .... [   ]
- (A) Pythagoras theorem (B) Thales theorem  
(C) Euclid's theorem (D) Brahmagupta theorem
20. The number of tangents drawn at the end points of the diameter is .... [   ]
- (A) 1 (B) 2  
(C) 3 (D) Infinite
21. If  $\sec A + \tan A = \frac{1}{5}$ , then  $\sec A - \tan A =$  .... [   ]
- (A) 5 (B)  $\frac{1}{5}$   
(C)  $\frac{4}{5}$  (D)  $\frac{2}{5}$

16E(B)

[2]

B

22. The length of shadow of a pole is equal to the length of the pole, then the angle of the elevation of the Sun is .... [ ]
- (A)  $15^\circ$  (B)  $30^\circ$   
(C)  $45^\circ$  (D)  $60^\circ$
23. Angle in a semi-circle is .... [ ]
- (A)  $60^\circ$  (B)  $90^\circ$   
(C)  $180^\circ$  (D)  $270^\circ$
24. The probability that the sum of two numbers appearing on the top of the dice is 13, when two dice are rolled at the same time is .... [ ]
- (A) -1 (B) 1  
(C) 0 (D) 2
25. If  $P(E) = 0.05$ , then  $P(\bar{E}) = \dots$  [ ]
- (A) 0.5 (B) 0.95  
(C) 9.5 (D) 0.095
26. The mode of the data 5, 6, 9, 10, 6, 11, 4, 6, 10, 4 is .... [ ]
- (A) 4 (B) 5  
(C) 6 (D) 10
27. Reciprocal of  $\tan \theta$  is ... [ ]
- (A)  $\sec \theta$  (B)  $\cot \theta$   
(C)  $\operatorname{cosec} \theta$  (D)  $-\tan \theta$
28.  $(\sec^2 \theta - 1)(\operatorname{cosec}^2 \theta - 1) = \dots$  [ ]
- (A) 0 (B) 1  
(C)  $\tan^2 \theta$  (D)  $\cot^2 \theta$

