This Question Paper contains 4 Printed Pages.

16E(A)

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 ΔABC, LM // BC and $\frac{AL}{LB} = \frac{2}{3}$, AM = 5 cm, find AC.

2. Evalute $\sin 15° \cdot \sec 75°$.

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 $\bar{x} = a + \frac{\Sigma f_i d_i}{\Sigma f_i}$.

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

SECTION - II

(Marks : 5×2=10)

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

(ii) Each question carries ***2*** *marks.*

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 cosec A.

What do you observe ?

8. Rehman observed the top of a temple at an angle of elevation of 30°, 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

SECTION - III

(Marks : 4×4=16)

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

*(ii) Choose any **one** from each question.*

*(iii) Each question carries **4** marks.*

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

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° 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, $\angle Q = 65°$ and PQ = 6 cm. Then draw another triangle, whose sides are $\frac{2}{3}$ times of the corresponding sides of ΔPQR.

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.

This Question Paper contains 4 Printed Pages.

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 × ½ = 10)*

Note :

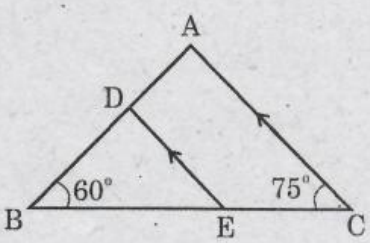
(i) *Answer* ***all*** *the questions.*

(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, ∠BDE = ... [ ]



(A) 45°

(B) 65°

(C) 75°

(D) 60°

15. $\cos 60° + \sin 30°$ value is..... [ ]

(A) $\sqrt{3}/2$ (B) 1

(C) $\cos 90°$ (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) $\left(a/3, 0\right)$

(C) $\left(0, b/3\right)$ (D) $\left(a/3, b/3\right)$

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) Pythagorus 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 $\sec A + \tan A = 1/5$, then $\sec A - \tan A$ = ... [ ]

(A) 5 (B) $1/5$

(C) $4/5$ (D) $2/5$

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° (B) 30°

(C) 45° (D) 60°

23. Angle in a semi-circle is ... [ ]

(A) 60° (B) 90°

(C) 180° (D) 270°

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 $P(\overline{E}) =$ .... [ ]

(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. $(\sec^2\theta - 1)(\operatorname{cosec}^2\theta - 1) =$ .... [ ]

(A) 0 (B) 1

(C) $\tan^2\theta$ (D) $\cot^2\theta$

29. The centre of the circle is (2, 1) and one end of the diameter is (3, – 4). Another end of the diameter is ..... [ ]

(A) (1, 6) (B) (–1, – 6)

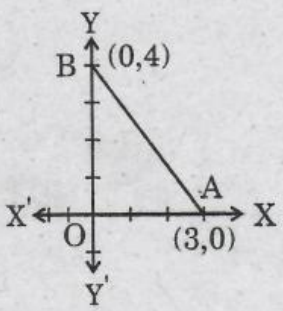
(C) (1, – 6) (D) (–1, 6)

30. The letter that represents $\frac{x_i - a}{h}$, which is used in measuring mean is .... [ ]

(A) d_i (B) f_i

(C) u_i (D) $\bar{x}$

31. In the given figure, area of ΔOAB is ..... [ ]



(A) 12 sq.u. (B) 6 sq.u.

(C) 24 sq.u. (D) 18 sq.u.

32. Which of the following be the probability of an event ? [ ]

(A) – 1.5 (B) 2.4

(C) 0.7 (D) 115%

33. $\sin (90 - A) = \frac{1}{2}$, then A = ... [ ]

(A) 30° (B) 45°

(C) 60° (D) 90°