**KHYBER PAKHTUNKHWA BOARD OF TECHNICAL EDUCATION, PESHAWAR**

R.No.\_\_\_\_\_\_\_\_\_\_\_\_

Sign Cand.\_\_\_\_\_\_\_\_

Signature of Supdt.

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**Diploma of Associate Engineers**

**Subject: - Applied Mathematics-I**

**Model Paper – B (Maths-113)**

Time Allowed: 03 Hours Total Marks: 75

**Note: -** There are three sections in this paper i.e. Section-A, B and C. Attempt Section-A on the same paper and return it to the superintendent within the given time.

No marks will be awarded for cutting, erasing or overwriting. Marks of identification will lead to U.F.M case. Mobile Phone etc are not allowed in the examination hall.

**Q-1:-** (A) Write the correct option a,b,c and d in the space provided against each part. (5)

1. Number of equal sides in an Isosaless triangle are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. 3 b) 4 c) 2 d) 5$$
3. External angle of an octagon is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. 90o  b) 45o c) 60o d) 30o
5. A rectangle prism whose length, breadth and height are equal is \_\_\_\_\_\_\_\_\_\_.
6. Ellips b) Circular Cone c) Cube d) Cylinder
7. Cross-section of a hallow cylinder is \_\_\_\_\_\_\_\_\_\_\_\_.
8. Circle b) Annulus c) Ellips d) Cone
9. Two vectors x and y are equal if:
10. x ≠ y b) x = y c) x < y d) x > y

(B) Tick (√) True or False in the following statements:

(i) Interior angle of a hexagon is 120o . ( True / False)

(ii) The space enclosed between two concentric circles is πγ. ( True / False)

(iii) Slant height of the pyramid is cu.m ( True / False)

(iv) Matrix A is skew-symmetric if At = A ( True / False)

 (v) Let A be a square matrix; A-1 exists if |A| = 0 ( True / False)

(C) Select the correct answer of each statement in column No.1 from column No.2 and place its identifying letter a,b,c etc in space provided against each statement in column No.1. (5)

 **Column No.1 Column No.2**

1. Simpson’s Rule is applicable only for number of strips ----- πrl
2. Curved surface of the cone is --------- 4πr2
3. Surface area of a ball of radius r is --------- odd
4. Considering scalars and vectors, the earth is --------- even
5. A matrix is singular if the value of its determinant is --------- zero

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**Model Paper – B (Maths-113)**

Time Allowed: 02 Hours & 40 Minutes Marks: 60

**(SECTION – B Marks:33)**

**Note: -**  Attempt any Eleven Parts from this section. Each part carry 3 marks.

**Q-2:-** (i) Find the area of an equilateral triangle each side is 36 cm long.

 (ii) Define square, rectangle and parallelogram.

(iii) A regular decagon is inscribed in a circle, the radius of which is 10 cm. Find the area of the decagon.

(iv) Find the circumference of the circle whose radius is 20.5 cm.

(v) Define irregular figure, write the formula of simpson’s rule.

(vi) For a polygonal prism (having a polygon base); write its volume, lateral surface area and total surface area.

(vii) What is the difference between circular cylinder and alliptic cylinder.

(viii)Find the area of the base of a pyramid whose base is an equilateral triangle of side 1 m and whose height is 4 m.

(ix) Define cone and write the formula for volume of the cone and total surface area.

(x) Find the surface area of a sphere with a radius of 22.5 cm.

(xi) Define vector, scalar and null vector.

(xii) Find the magnitude of the vector a where a = - 3i + 4j – 2k.

(xiii)If A = 1 2 , B = 3 2 Find AB.

 3 4 0 1

 1 -3 -2

(xiv) Evaluate 4 -1 0 by minors.

 4 3 -5

(xv) Prove that; If all the elements of a row of a determinant is zero. Then the value of the determinant will be zero.

**(SECTION – C Marks:27)**

**Note: -**  Attempt any three questions from this section. Each question carry 09 marks.

**Q-3:-** Find the area of the Quadrilateral ABCD in which the sides AB, BC, CD, DA and the diagonal AC are 25, 60, 52, 39 and 65 meters respectively.

**Q-4:-** Find the area of the segment whose chord is 10 m and whose height is 1.5 m.

**Q-5:-** A hallow cylindrical tube open at both ends made of iron ½ cm thick. If the inner diameter is 5 cm and length is 96 cm. Find the volume of the iron in it.

**Q-6:-** For the vectors a = 5i – 3j + 4k and b = j – k. Determine sin of the angle between a and b.

**Q-7:-** Solve the following system of equation by cramer’s rule.

 **x + y + z = 4**

 **2x – y – 2z = -1**

 **x – 2y – z = 1**