Model Question for SEE Preparation Examination-2079

Set – 1

Subject: Compulsory Mathematics Time: 3 hours Full Marks : 100

Attempt all the questions.

Group 'A' [6 × 1 = 6]

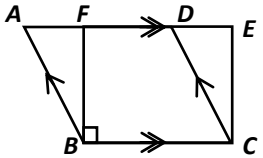
1) a. If initial Population of a town is M_0, population after T years is M_T and rate of annual population growth is R%, then express M_T in terms of M_0, T and R.

b. If equal sides and base of an isosceles triangle are p cm and q cm respectively, then what is its area? Write it.

2) a. Write $2\sqrt[3]{2}$ into pure surds.

b. In a continuous series, the value of assumed mean is A and the sum of the frequencies(f) is N. If the deviation of mid value of class interval and assumed mean is D, then find the mean of the data.

3) a. In the given figure, **ABCD** is a rhombus and **BCEF** is a rectangle. If area of rectangle is **40*cm*^{2},** find the area of the rhombus **ABCD.**



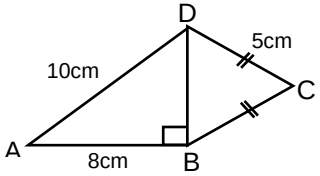
b. Write the relation between the inscribed angle **QPR** and the central angle **QOR** formed on the same arc **QR** of a circle with centre **O**.

Group 'B' [17 × 2 = 34]

4) a. The marked price of a calculator is Rs. 4000 which is sold including 15% VAT. How much money does a customer get back if he gives Rs. 5,000?

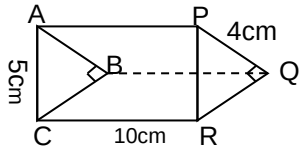
b. In how many years, the price of a second car becomes Rs. 428687.5 from Rs 500,000 at the depreciation rate 5% pa?

5) a. Find the area of given plane figure.



b. If volume of a sphere is 38808 cm^3. Find the total surface area of hemi-spheres when it cuts into two equal two halves.

c. Find the area of the rectangular surface of the adjoining triangular base prism.



6) a. Find the H.C.F.: **$16x^4 + 4x^2 + 1$** and **$8x^3 + 1$**

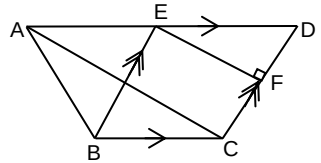
b. Find the L.C.M.: **$x^2 - 3x + 3y - y^2$** and **$y^2 + xy - 3y$**

7) a. If 7 is added to twice the square of a natural number, the sum is 105. Find the natural number.

b. Simplify: $\frac{7^{n+2} - 28\times 7^{n-1}}{7^{n+1} + 8\times 7^n}$

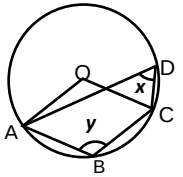
c. Solve: $\sqrt{4x^2 - 20} = 2x - 3$

8) a. In the adjoining figure, ***BCDE*** is a parallelogram. If ***EF* = 12*cm*** and ***CD* = 20 *cm***, calculate the area of **Δ ABC**.



b. In the adjoining circle with centre **O**,

reflex **∠AOC = 240^0**, find the value of ***x*** and ***y***.



c. Find the length of a tangent up to the point of contact drawn from a point 13 cm far from the centre of a circle with radius 5 cm.

9) a. If the area of **Δ DEF** is $30\sqrt{3}$ sq. cm. If **DE** = 10 cm and **DE** = 12 cm, then find the value of **∠EDF.**

b. In a continuous data the median class is (30 – 40). If the sum of the frequencies is twice the cumulative frequency of the pre-median class, find the median of the data.

10) a. A card is drawn from the number cards numbered from 10 to 39. Find the probability of getting a number card which is divisible by 6 or 7.

b. A bag contains 1 black, 2 red and 3 black balls of the same shape and size. Two balls are drawn randomly one after another without replacement from the bag. Show the probability of all possible outcomes in a tree diagram.

Group 'C' [10 × 4 = 40]

11) In a survey of players, the ratio of the number of players who liked to play football and cricket was 8:9. If 50 liked to play both the games, 40 liked to play cricket only and 80 liked none of the games.

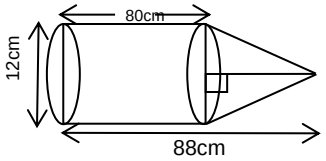
(a) Find the number of players who liked to play football only?

(b) Total numbers of players?

(c) Show the result in a Venn-diagram.

12) In a money exchange centre, the buying rate and selling rate of 1 US dollar are Rs 124 and Rs 125 respectively. Pemba bought US dollar of Rs 625,000 from the exchanger and sold in the next day in which day Nepali currency devaluated by 5%. Find his profit amount and profit percent.

13) Find the total surface area of the adjoining solid object.



14) Simplify: $\frac{x+4}{x^2+4x+16}+\frac{x-4}{x^2-4x+16}-\frac{128}{x^4+16x+256}$

15) Simplify: $\frac{\left(y+\frac{1}{x}\right)^{x+y}\left(x-\frac{1}{y}\right)^{x+y}}{\left(x^2-\frac{1}{y^2}\right)^{x}\left(y^2-\frac{1}{x^2}\right)^{y}}$

16) Parallelograms PQRS and QRTU are standing on the same base QR and between the same parallel lines PT and QR. Prove that the area of parallelogram PQRS and parallelogram QRTU are equal.

17) Construct a quadrilateral **FEWA** in which **FE** = 5cm, **EW** = 6cm, **WA** = 5.5cm and **AF** = 4.5cm and $\angle$**AFE** = 75^0. Also, construct a **ΔFAR** having equal in area to the quadrilateral **FEWA.**

18) In a cyclic quadrilateral ***RAMU***, verify experimentally that $\angle$**RAM + $\angle$MUR = 180^0**. (*Two circles with radii at least 3cm are necessary*).

19) The top of a tree broken by the wind and make an angle of 30^0 with the ground. If the distance of the point where the top touched the ground from the foot of the tree is $15\sqrt{3}$ ft, find the height of the tree before it was broken.

20) The following are the marks obtained by the students in mathematics in an examination.

15, 12, 35, 30, 45, 24, 58, 19, 13, 52, 33, 43, 26, 58,
18, 38, 47, 40, 33, 55, 31, 22, 16, 44, 48, 50, 20, 45

i) Make a frequency table of class interval 10.
ii) Find the third quartile.

Group 'D'

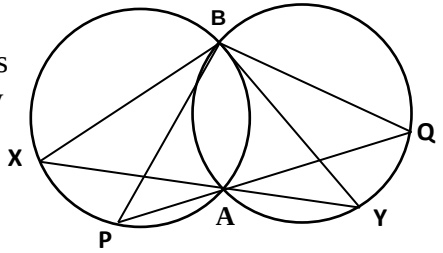
[4× 5 = 20]

21) A bank has fixed the rate of interest 10% per annum semi- annually compound interest in account A, 12% per annum annually compound interest in account B. If you and your friend Kosish are going to deposit Rs 200,000 each for 2 years in the same bank, you deposited in account A and Kosish deposited in account B, who chose better account and why? Give your reasons with calculation. Also calculate how much percent more or less interest you got.

22) A temple with 9 m height is the combination of a pyramid and a square base prism. The height of prism is 6m and length of a side of the base of prism is 8 m. Find the total cost of covering the lateral surface of pyramid by zinc plate and paving the tiles in the walls at the rate of Rs 600 per square meter and Rs 400 per square meter respectively.

23) The perimeter of a rectangular play ground is 280 meter. When its side is reduced then new length and breadth are $\frac{4}{5}$ and 75% of previous length and breadth respectively. If new perimeter of the ground is 218 meter, what was the length and breadth of the ground in the beginning? Find it.

24) In the given figure, two circles intersect at **A** and **B**. Through **A** two straight lines **PAQ** and **XAY** are drawn terminated by the circumference. Prove that:
$\angle$ PBX = $\angle$ QBY



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