

Time allowed: One and a half hours

Maximum Marks: 40

Attempt **all** questions from **Section A** and **any three** questions from **Section B**.  
The intended marks for questions or parts of questions are given in brackets [ ].

**SECTION - A**

**(Attempt all questions from this Section)**

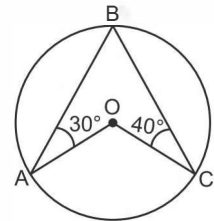
1. Choose the correct answers to the questions from the given options. (Do not copy the question, write the correct answer only.) [10]

(i) The coordinates of the image of the point  $(4, -1)$  when reflected in  $x$ -axis followed by reflection in  $y$ -axis are :

- (a)  $(-4, -1)$                       (b)  $(-4, 1)$                       (c)  $(4, 1)$                       (d)  $(1, -4)$

(ii) In the figure, if  $O$  is the centre of the circle. The measure of  $\angle AOC$  is :

- (a)  $70^\circ$                       (b)  $110^\circ$   
(c)  $140^\circ$                       (d)  $150^\circ$



(iii) The sum of the radius of the base and height of a solid cylinder is 37 m. If the total surface area of the cylinder is  $1628 \text{ m}^2$ , then its volume is :

- (a)  $2340 \text{ m}^3$                       (b)  $3250 \text{ m}^3$                       (c)  $4082 \text{ m}^3$                       (d)  $4620 \text{ m}^3$

(iv) The coordinates of a point  $A$ , where  $AB$  is a diameter of a circle whose centre is  $(2, -3)$  and  $B$  is the point  $(1, 4)$  are :

- (a)  $(2, -10)$                       (b)  $(-3, 10)$                       (c)  $(-2, -5)$                       (d)  $(3, -10)$

(v)  $(\operatorname{cosec}\theta - \cot\theta)^2$  is equal to :

- (a)  $\frac{1-\cos\theta}{1+\cos\theta}$                       (b)  $\frac{1+\cos\theta}{1-\cos\theta}$                       (c)  $\frac{1+\cos\theta}{1-\sin\theta}$                       (d)  $\frac{1+\sin\theta}{1+\cos\theta}$

(vi) The class mark of the class-next to the median class of the given distribution is :

Class	2 – 6	6 – 10	10 – 14	14 – 18	18 – 22
Frequency	5	10	16	6	3

- (a) 8                      (b) 12                      (c) 16                      (d) 20

(vii) If the lines  $px + 3y = 2$  and  $2x - qy + 5 = 0$  are parallel, then :

- (a)  $p + q = 6$                       (b)  $pq = -6$                       (c)  $p - q = -6$                       (d)  $\frac{p}{q} = -6$

(viii) The circumference of the base of a 12 m high solid cone is 22 m. The volume of the cone is:

- (a)  $462 \text{ m}^3$                       (b)  $400 \text{ m}^3$                       (c)  $381 \text{ m}^3$                       (d)  $336 \text{ m}^3$

(ix) The lower quartile of the data 40, 68, 18, 27, 12, 44, 17, 48, 55, 32, 47, 21 is:

- (a) 18                      (b) 36                      (c) 47                      (d) 50

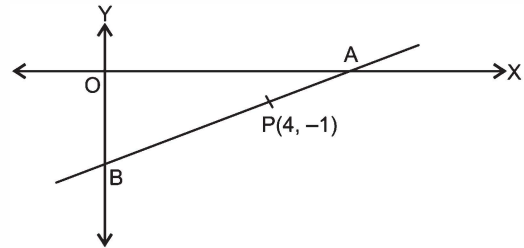
(x) The probability of getting the bad egg in a lot of 400 eggs is 0.035. The number of bad eggs in the lot is :

- (a) 7                      (b) 14                      (c) 21                      (d) 28

**SECTION - B**

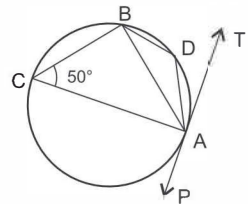
(Attempt any three questions from this Section)

2. (i) A line AB meets  $x$ -axis at A and  $y$ -axis at B. P(4, -1) divides AB in the ratio 1 : 2.  
 (a) Find the coordinates of A and B.  
 (b) Find the equation of the line through P and perpendicular to AB. [2]



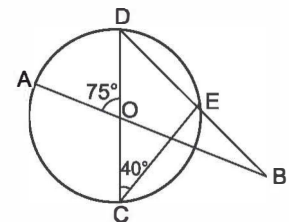
- (ii) A card is drawn at random from a pack of 52 playing cards. Find the probability that the drawn card is neither a red card nor a black king. [2]

- (iii) In the figure, PAT is a tangent at A. If  $\angle ACB = 50^\circ$ , find (a)  $\angle TAB$  and (b)  $\angle ADB$ . [3]



- (iv) A straight highway leads to the foot of a tower of height 50 m. From the top of the tower, the angles of depression of two cars, standing on the highway are  $30^\circ$  and  $60^\circ$ . What is the distance between the two cars and how far is each car from the tower? [3]

3. (i) In the figure, the straight lines AB and CD pass through the centre O of the circle. If  $\angle AOD = 75^\circ$  and  $\angle OCE = 40^\circ$ , find : (a)  $\angle CDE$  (b)  $\angle OBE$  [2]



- (ii) Water flows through a cylindrical pipe of internal diameter 7 cm at 36 km/h. Calculate the time in minutes it would take to fill a cylindrical tank, the radius of whose base is 35 cm and height 1 m. [2]

- (iii) If  $\sec \theta + \tan \theta = m$ , show that  $\frac{m^2 - 1}{m^2 + 1} = \sin \theta$ . [3]

- (iv) Construct an ogive for the following data and hence estimate the median from it. [3]

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30
Frequency	2	7	18	10	8	5

4. (i) A (2, 7) and B (-3, 5) are two given points. Find (a) the gradient of AB, (b) the equation of AB. [2]

- (ii) Find the mean of the following distribution : [2]

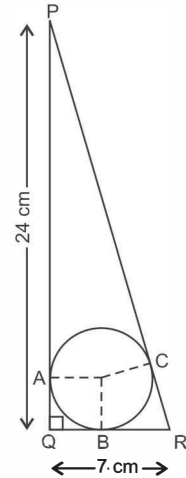
Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	3	5	9	5	3

- (iii) A cylindrical vessel with internal diameter 10 cm and height 10.5 cm is full of water. A solid cone of base diameter 7 cm and height 6 cm is completely immersed in water. Find the volume of : [3]

- (a) Water displaced out of the cylindrical vessel.  
 (b) Water left in the cylindrical vessel. [Take  $\pi = 22/7$ ]

- (iv) A triangle with vertices A(1, 2), B(4, 4) and C(3, 7) is first reflected in the line  $y = 0$  onto  $\Delta A'B'C'$  and then  $\Delta A'B'C'$  is reflected in the origin onto  $\Delta A''B''C''$ . Write down the co-ordinates of (a) A', B' and C' (b) A'', B'' and C''. [3]

5. (i) In  $\Delta PQR$ ;  $\angle PQR = 90^\circ$ ,  $PQ = 24$  cm and  $QR = 7$  cm. Find the radius of the inscribed circle. [2]



- (ii) Prove that :  $\frac{\cos \theta}{\operatorname{cosec} \theta + 1} + \frac{\cos \theta}{\operatorname{cosec} \theta - 1} = 2 \tan \theta$  [2]

- (iii) Find the equation of the line parallel to  $2x + 5y - 9 = 0$  and passing through the mid-point of the line segment joining A(2, 7) and B(-4, 1). [3]

- (iv) Use graph paper for this question. Estimate the mode of the given distribution by plotting a histogram. [3]

Class	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
Frequency	4	8	10	12	10	4	2

6. (i) If the probability of winning a game is 0.26, what is the probability of losing it? [2]  
 (ii) Find the equation of a line which has  $y$ -intercept 4 and is parallel to the line  $2x - 3y = 7$ . Find the coordinates of the point where the line cuts  $x$ -axis. [2]  
 (iii) A man observes the angle of elevation of the top of the tower to be  $45^\circ$ . He walks towards it in a horizontal line through its base. On covering 20 m, the angle of elevation changes to  $60^\circ$ . Find the height of the tower correct to 2 significant figures. [3]  
 (iv) The mean of the following frequency distribution is 53. Find the missing frequencies  $f_1$  and  $f_2$ . [3]

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	Total
Frequency	15	$f_1$	21	$f_2$	17	100

## ANSWERS

### MODEL TEST PAPER 1

1. (i) (b) (ii) (c) (iii) (d) (iv) (d) (v) (a) (vi) (b) (vii) (c) (viii) (b) (ix) (c) (x) (b)  
 2. (i) 2 : 1 (ii)  $\frac{1}{7}$  (iii)  $60^\circ$  (iv) 17.32 m, 10 m 3. (i)  $180^\circ$  (ii) 16 cm (iv)  $54^\circ$   
 4. (i)  $3x - 2y + 4 = 0$  (ii) 49.2 (iii) 2 cm  
 5. (i)  $100^\circ$  (ii) (a) -2 (b)  $x - 2y + 2 = 0$  (c) 0 (iv) 33  
 6. (i) (a)  $\frac{15}{36}$  (b)  $\frac{1}{6}$  (ii) (4, 1), (5, 5) (iv) 28