

## Half Yearly Examination 2016-2017

Std. : IX  
Subject : MATHEMATICS

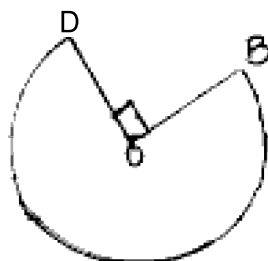
Full Marks : 80  
Time : 2½ Hrs.+15mins.

### SECTION-A (40 Marks) (Attempt all questions)

- Q1.** a) Rs. 16000/- invested at 10% p.a. compounded semi-annually amounts to Rs. 18522/- find the time period of the investment. [4]  
 b) Solve for  $x$  :  $9^{x+2} = 240 + 9^x$  [3]  
 c) Factorise  $1 - a^2 + 2ab - b^2$  [3]

- Q2.** a) The sides of a right angle triangle containing the right angle are  $5x$  cm and  $(3x-1)$  cm. Calculate the length of the hypotenuse of the triangle if its area is  $60\text{cm}^2$ . [4]

- b) The shape of the table-top in a restaurant is that of a sector of a circle with centre  $O$  and  $\angle BOD = 90^\circ$ . If  $BO = OD = 60$  cm. find (i) the area of the table-top (ii) the perimeter of the table top take  $\pi = 3.14$  [3]



- (c) Find the value of  $a$  if the distance between the points  $A (-3, -14)$  and  $B (a, -5)$  is 9 units. [3]

- Q3.** a) Use graph paper. Take  $1\text{cm} = 1$  unit.  
 1. Plot the point  $A (4,4)$ ,  $B (4, -6)$ ,  $C (8,0)$   
 2. Reflect  $A,B,C$ , on  $x = O$  to  $A' B' C'$ . Write the coordinates of  $A' B' C'$ .  
 3. Give the geometrical name of  $AA' C' B' Bc$ .  
 4. Find the area of the figure formed. [4]  
 b) If  $x + \frac{1}{x} = 4$  find  $x^3 + \frac{1}{x^3}$  [3]  
 c) Factorise :  $a^3 - 0.216$  [3]

- Q4.** a) The mean of the following distribution is  $21\frac{1}{7}$ . Find the value of  $f$   

CI	0-10	10-20	20-30	30-40	40-50	
Freq.	8	22	31	$f$	2	[5]

 b) Draw a histogram, frequency polygon and estimate the mode.  

CI	10-20	20-30	30-40	40-50	50-60	
Freq.	11	13	14	8	4	[5]

**SECTION-B (40 Marks)**  
**(Attempt any four questions)**

**Q5. a)** Draw a histogram for the following data. (use graph paper) [6]

Age	15-20	20-25	25-30	30-35	35-40	40-45	45-50
No. of workers	4	6	10	18	12	18	2

Find (i) the median (ii) Upper quartile (iii) Lower Quartile (iv) the number of workers whose age is less than 32 years.

b) Gopal has a Recurring deposit account and deposits Rs. 900 per month for a period of 4 years. If he gets Rs. 52020 at the time of maturity. Find the rate of interest. [4]

**Q6. a)** The entries of a saving bank passbook are given below.

Date	Particulars	Withdrawals	Deposit	Balance.
Feb. 9	B / F			6500
Feb. 17	To self	2400		
Apr. 11	By Cash		1700	
June 15	To self	2000		
July 7	By Cash		6000	

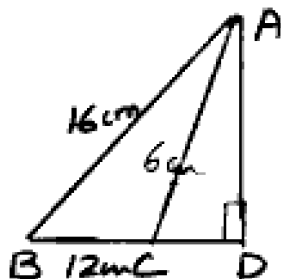
Calculate the interest for six months from Feb. to July at 6% p.a. [5]

b) Find the mean of the following distribution using the short-cut method. [5]

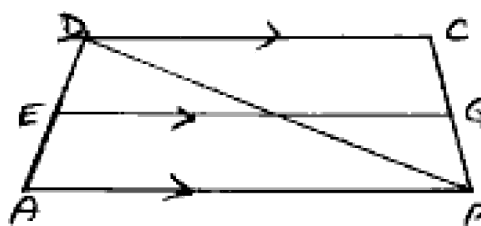
CI	35-40	40-45	45-50	50-55	55-60
Freq.	7	6	9	5	3

**Q7. a)** Construct a trapezium ABCD in which AD//BC,  $\angle B = 60^\circ$  AB = 5 cm BC = 6.2 cm and CD = 4.8 cm. Measure  $\angle ADC$ . [5]

b) In the figure LD = 900, AB = 16 cm, BC = 12 cm, CA = 6 cm Find CD. [5]



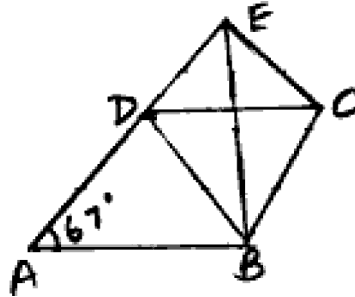
**Q8. a)** In the figure AB//DC//EG.  
If E is the mid point of AD prove that  
(i) G is the mid point of BC  
(ii)  $2EG = AB + CD$ .



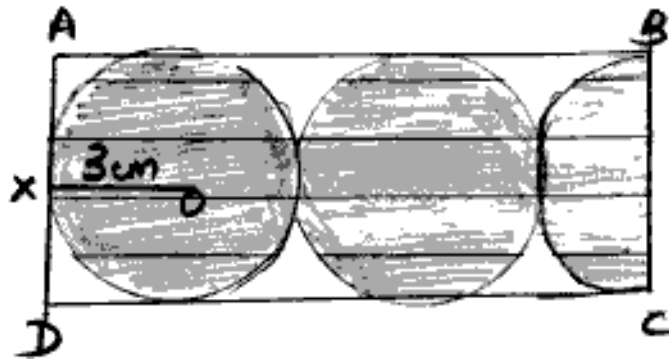
[5]

- b) Find the circumference of the circle whose area is 16 times the area of the circle with diameter 7 cm. [5]

- Q9.** a) ABCD is a rhombus with  $\angle A = 67^\circ$ . If DEC is an equilateral triangle. Calculate  $\angle CBE$  and  $\angle DBE$ . [5]



- b) Find the area of the unshaded portion with the rectangle ABCD. Diameters of the circles are 6 cm. [5]



- Q10.** a) The ratio of two numbers is 2:3. If 2 is subtracted from the first and 8 is subtracted from the second, the ratio becomes the reciprocal of the original ratio. Find the numbers. [4]

- b) Solve  $\frac{7^{2n+3} - (49)^{n+2}}{((343)^{n+1})^{2/3}}$  [3]

- c) Find the mean, median and mode of the following numbers. 78, 56, 22, 34, 45, 54, 39, 68, 54, 84. [3]

- Q11.** a) Show that the points P (0,5) Q (5,10) and R (6,3) are vertices of an isosceles triangle. [4]

- b) Solve for x and y :  $41x + 53y = 135$   
 $53x + 41y = 147$  [3]

- c) If  $a^2 + b^2 + c^2 = 50$ ,  $ab+bc+ca = 47$ . Find  $a+b+c$ . [3]