Half Yearly Examination 2016-2017

Std. : IX **Full Marks : 80**

Subject : MATHEMATICS **Time : 2½ Hrs.+15mins.**

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

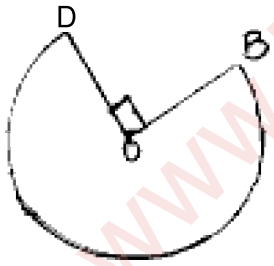
Q1. a) Rs. 16000/- invested at 10% p.a. compounded semi-annually amounts to Rs. 18522/- find the time period of the investment. [4]

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 $60cm^2$. [4]

b) The shape of the table-top in a restaurant is that of a sector of a circle with centre O and $\angle BOD = 90^O$. 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 1cm = 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
Freg.	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
Freg.	11	13	14	8	4

[5]

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

Q5. a) Draw an o give 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 entres 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	

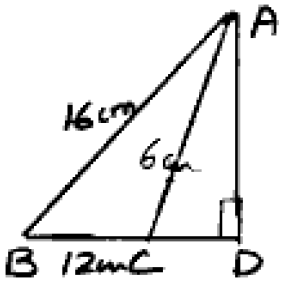
Calculate the interest for six months from Feb. to July at 6% p.a. [5]

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

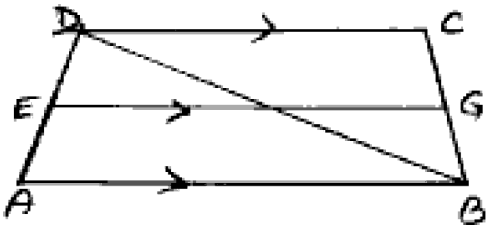
CI	35-40	40-45	45-50	50-55	55-60
Freg.	7	6	9	5	3

Q7. a) Construct a trapezium ABCD in which AD//BC, $\angle B = 60^{O}$ 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]

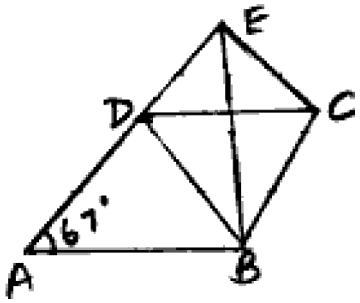


Q8. a) In the figure AB//DC//EG.
If E is the mid point of AD prove that
(i) G is the mid point of BC
(ii) 2EG = AB+CD. [5]

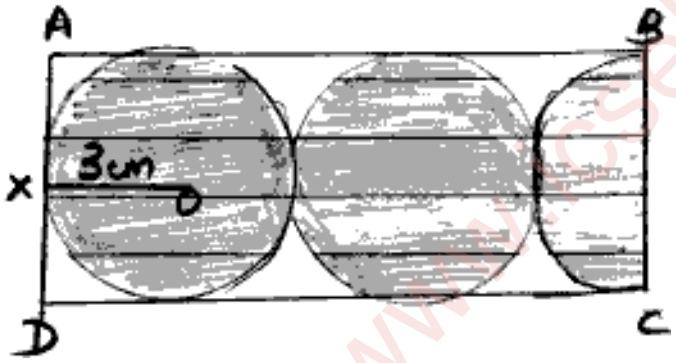


b) Find the circumference of the circle whose area is 16 times the area of the circle with diameter 7 cm. [5]

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 substracted 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 $\dfrac{7^{2n+3} - (49)^{n+2}}{((343)^{n+1})^{2/3}}$ [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]