II- B. Sc PHY & CHE

I- SESSIONALEXAM IV SEMESTER MAX.MARKS: 50 TIME: 2 HOURS

MATHEMATICS-II (05AT02) Section A

Answer all the questions:

1.	The order of th	e differential eq	uation $\left[1 + \frac{dy}{dy}\right]$	$a^{\frac{3}{2}} = a \frac{d^2 y}{d^2 x^2}$ is
	a) 3 b) 2	2 c) 4	$\begin{array}{c} \mathbf{L} & dx \mathbf{J} \\ \mathbf{d} & \mathbf{l} \end{array}$	dx^2 —
2.	The order of th	e differential eq	uation $y' = 3x$	$^{2} + 7$ is
	a) 3 b) 2	2 c) 4	d) 1	
3.	The degree of t	the differential e	equation $\frac{dy}{dx} + y$	cotx = 0 is
	a) 1 b) 2	2 c) 4	d) 3	
4.	The degree of t	the differential e	equation $\left[1 + \frac{dy}{dx}\right]$	$\left(\frac{d^2y}{dx^2}\right)^{\frac{5}{4}} = a \frac{d^2y}{dx^2}$ is
	a) 2 b)	5 c) 6	d) 4.	
5.	The order of th	e differential eq	uation $\left(\frac{dy}{dx}\right)^4 =$	$\frac{d^6 y}{dx^6}$ is
	a) 7 b)	6 c) 5	d) 3	
6.	d(xy) =			
	a) $xy' + yx'$	b) $xy' - yx'$	c) $-xy' + y$	(xy' + yx').
7.	$d\left[\frac{x}{y}\right] = $	·		
	a) $\frac{ydx - xdy}{y^2}$	b) $\frac{xdy-ydx}{y^2}$	c) $2\frac{ydx-xdy}{x^2}$	d) $2\frac{xdy-ydx}{y^2}$
8.	The derivative	of <i>sin x</i> is	`. .	
0	a) $\cos x$	b) $-\cos x$	c) sin x	d) $-\sin x$.
9.	If $y = ax^2$, th	en $y' = $		0 (b
10	a) Zu The derivative	$0) 2\lambda$	C) Zux	u) ()
10		OI $\frac{1}{x^4}$ IS	A	4
	a) $\frac{4}{x^5}$	b) $-\frac{4}{x^5}$	c) $\frac{1}{x^3}$	d) $-\frac{1}{x^3}$

<u>SECTION – B</u>

Answer Any five of the following questions: 5×2=10

Find the order and degree of the equation

11.
$$yy'' + (y')^2 = 0.$$

12. $\sqrt{y' + y} = sinx$
13. $[1 + (y')^2]^3 = ky''$
14.Eliminate c from $y = cx^2 + c - c^3..$
15.Eliminate c_1 and c_2 from $y = c_1e^{2x} + c_2e^{-2x}.$
16.Find the differential equation $y = sin(logx).$
17.Solve $(1 - x)dy - (1 + y)dx = 0.$

SECTION – C

<u>Answer any three of the following questions</u> 18. Solve i) $y' = \left(\frac{y}{x}\right) + \tan\left(\frac{y}{x}\right)$ ii) $y' + \frac{1+y^2}{1+x^2} = 0$ 19. Solve $\frac{dy}{dx} = \frac{x+y}{y-x}$. 20. Solve $\frac{dy}{dx} = \frac{x-y}{x+y}$. 21.Solve $y^2 dx + (xy + x^2) dy = 0.$ 22. Solve $\frac{dy}{dx} = \frac{6x - 4y + 3}{3x - 2y + 1}.$

SECTION-D

Answer any one of the following questions 23. Solve $\frac{dy}{dx} + \frac{10x+8y-12}{7x+5y-9} = 0.$ 24. Solve a) $\frac{dy}{dx} = \frac{y^3 + 3x^2y}{x^3 + 3xy^2}$ b) $(x^2 + y^2)dx = 2xydy$.

ALL THE BEST

 $1 \times 12 = 12$

3×6=18

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST								
CLASS TITLE MONTH & YEAR TIME	DEPARTMENT OF MATHEMAT : II – CHEMISTRY& PHYSICS : MATHEMATICS – III : JAN 2019 : 2 HOURS I SESSIONAL EXAMINATION		ICS SUBJECT : ALLIED SUB. CODE : O5AT03 DATE : 04/01/2019 MAX. MARKS : 50					
	SEC	ΓΙΟΝ-Α						
	ANSWER ALL THE Q	UESTIONS (10 >	× 1 = 10)					
1. In a partial differ	rential equations, p denotes	3:						
a) $\frac{\partial z}{\partial r}$	b) $\frac{\partial z}{\partial y}$	c) $-\frac{\partial z}{\partial r}$	d) –	$\frac{\partial z}{\partial y}$				
2. In a partial differ	rential equations, q denotes	5: 5:		0 y				
a) $\frac{\partial z}{\partial x}$	b) $\frac{\partial z}{\partial y}$	c) $-\frac{\partial z}{\partial x}$	d) –	$\frac{\partial z}{\partial y}$				
3. In a partial differ	rential equations, r denotes	:		0 y				
a) $\frac{\partial^2 z}{\partial r^2}$	b) $\frac{\partial^2 z}{\partial y^2}$	c) $\frac{\partial^2 z}{\partial x \partial y}$	d) –	$\frac{\partial^2 z}{\partial r^2}$				
4. In a partial differ	rential equations, s denotes	:		0,				
a) $\frac{\partial^2 z}{\partial x^2}$	b) $\frac{\partial^2 z}{\partial y^2}$	c) $\frac{\partial^2 z}{\partial x \partial y}$	d) –	$\frac{\partial^2 z}{\partial x^2}$				
5. In a partial differ	rential equations, t denotes	:		0,1				
a) $\frac{\partial^2 z}{\partial r^2}$	b) $\frac{\partial^2 z}{\partial v^2}$	c) $\frac{\partial^2 z}{\partial r \partial y}$	d) –	$\frac{\partial^2 z}{\partial x^2}$				
6. The solution con	ntaining as many arbitrary c	constants as there a	are independent v	ariables is				
called								
a) Complete integra	al b) Singular integral	c) Particular inte	egral d) Gen	eral integral				
7. The solution obt	ained by giving particular v	values to the arbitr	ary constants in a	a complete				
a) Complete integra	al b) Singular integral	c) Particular inte	egral d) Gen	eral integral				
8. In a partial differ	rential equations, the gener	al term of Standar	d 1 is					
a) $f(p,q) = 0$	b) $F(x, p, q) = 0$ c)	$f_1(x,p) = f_2(y,q)$	(q) d) $z = p\overline{x}$ -	+qy+f(p,q)				
9. In a partial differ	9. In a partial differential equations, the general term of Standard 2 is							
a) $f(p,q) = 0$	b) $F(x, p, q) = 0$ c)	$f_1(x,p) = f_2(y,q)$	(q) d) $z = px$ -	+qy+f(p,q)				
10. In a partial difference of $f(n, q) = 0$	rential equations, the gener b) $F(r, n, q) = 0$	al term of Standar $f_1(x, n) = f_1(x, n)$	$a \ 5 \ 18 \ _$	$\perp a_{1} \perp f(n, a)$				
a) j(p,q) = 0	0) F(x, p, q) = 0	$J_1(x, p) - J_2(y, 0)$	a_{j} $a_{j} z - p x $	' <i>qy</i> + j (p,q)				

SECTION-B

ANSWER ANY FIVE QUESTIONS (5 X 2 = 10) 11. Form the p.d.e by eliminating the arbitrary constants from z = ax + by + ab.

- 12. Form the p.d.e by eliminating the arbitrary function from z = f(x + ay).
- 13. Form the p.d.e by eliminating the arbitrary function from $z = f(x^2 y^2)$.

14. Solve p + q = 1.

15. Solve pq + p + q = 0.

16. Solve $p^2 + q^2 = 1$.

17. Solve yzp + zxq = xy.

SECTION – C

ANSWER ANY THREE QUESTIONS (3 X 6 = 18)

18. Form the p.d.e by eliminating the arbitrary functions from z = f(x + iy) + g(x - iy).

19. Form the p.d.e by eliminating the arbitrary function from $g(x + y + z, x^2 + y^2 + z^2)$. 20. Solve $x^2 p + y^2 q = z^2$.

21. Solve x(y - z) p + y(z - x) q = z(x - y).

22. Solve z = px + qy + pq.

SECTION – D

ANSWER ANY ONE QUESTION (1 X 12 = 12)

23. Solve $(x^2 - yz) p + (y^2 - zx) q = z^2 - xy$. 24. Solve $z = px + qy + p^2 + q^2$.

***** All the best *****

Department of mathematics

					sub.code:05AT41	
Date:		Programming in C++		marks:50		
Answer all Ques	tions				(10× 1=10)	
1 is the c	is the collection of elements of function and variables					
(A) Class	(B) object	(C) arr	ay	(D) structu	re	
2 reduce the length and complenify of program						
(A) Function	(B) pointer	(C) Ar	ray	(D) string		
3 has the	e same name a	s class				
(A) Function	(B) object	(C) arr	ay	(D)stuructu	ire	
4. Which operator	cannot be ove	rloaded?				
(A) ::	(B) +	(C) *		(D) >>		
5. The group of ch						
(A) Method	(B) member	(C) stri	ing	(D) object		
6. which is the assignment operator						
(A) +=	(B) *	(C) ?		(D) =		
7. Which one of the	e scope resolut	tion oper	rator			
(A) =	(B) ≠	(C)?		(D)::		
8. Which is the Rel	lational operate	or				
(A) <	(B) &&	¢	(C)*	(D) none		
9. Which is increment operator						
(A) + +	(B) =		(C) !	(D) None		
10. Which is decreme	ent operator					
(A) ++	(B) – –		(C) *	(D) None		

SECTION-B

Answer any Five Question	(5×2=10)
11. What is an function	
12. Define static	
13.Define call by reference	
14. Define Return state ment	
15. Define Default Arguments	
16. Define const Arguments	
17. Explain inline function	
SECTION-C	
Answer Any Three Questions	(3×6=18)
18. Write the benefits of oops in c++	
19.Write about the structure of c++ program	
20. Explain any five math library function in c++	
21. Explain about inline function	
22. Explain about switch statement in c++	
SECTION-D	

Answer any One Question

- 23.Explain the basic concept of oops
- 24. Discuss about various looping statement in c++

******ALL THE BEST******

(1×12=12)

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST								
CLASS TITLE MONTH & YEAR TIME	DEPARTMEN : II - MATHS : SEQUENCES ANI : JAN 2019 : 2 HOURS I SESSION	NT OF MATHEMAT D SERIES NAL EXAMINATION	TICS SUBJECT : CORE SUB. CODE : 05CT41 DATE : 07/01/2019 MAX. MARKS : 50					
	SECTION-A ANSWER ALL THE QUESTIONS $(10 \times 1 = 10)$							
1. Let $A = (0,1)$, the g	.l.b and l.u.b of A is							
(A) 1,0	(B) 0,1	(C) 0,0	(D)1,1					
2. Let A = $\{1,3,5,6\}$ the	hen g.l.b of A $=1$ and l.	u.b of A =						
(A) 2	(B)3	(C) 5	(D)6					
3. For any two real nu	The imbers x and y then $ x $	-y is						
(A) 0	(B) 1	$(\mathbf{C}) \ge \left\ x \right\ - \left\ y \right\ $	$(\mathbf{D}) \leq \left\ x \right\ - \left\ y \right\ $					
4. A sequence (a _n) is	said to be if ther	e exists a real number	k such that $a_n \ge k$ for all n.					
(A) bounded above (B) bounded below (C) unbounded (D) both bounded								
5. The sequence 1,-1, (A) $(-1)^n$	1,-1, is represented a (B) $((-1)^n)$	$(C) ((-1)^{n+1})$	(D) $(-1)^{n+1}$					
6. The function $f(n)$	$=\left\{\frac{n}{n+1} \text{ determines th}\right.$	ne sequence						
(A) $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$	(B) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \dots$	(C) $1, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \dots$	(D) 0,1,1,2,2,3,3,					
 7. The sequence 1,1,2,3,5,8,13, is called (A) Cauchy sequence (B) Fibonacci's sequence (C) Geometric sequence (D) Harmonic sequence 8. The following statement are true except 								
(A) $(\frac{1}{n})$ is a converge	nt sequence	(B) $\left(\frac{1}{n}\right)$ is a bounded sequence						
(C) $(\frac{1}{n})$ is a monotonic sequence		(D) $(\frac{1}{n})$ is a strictly monotonic decreasing sequence						
9. The range of the sequence $(1+(-1)^n)$ is								
$(A) \mathbf{N}$	(B) Z	(C) {0,1)	(D) $\{0,2\}$					
10. $f: A \rightarrow R$ is said	(D) unbounded for sti	(C) onto function	(D) into function					
(A) bounded function	(B) undounded function	On(C) onto function	(D) into function					

SECTION-B

ANSWER ANY FIVE QUESTIONS (5 X 2 = 10)

11. If a, b & c are any three distinct positive real numbers, prove that $a^2 + b^2 + c^2 > ab + bc + ca$.

- 12. Prove that $a^7 + b^7 + c^7 > abc (a^4 + b^4 + c^4)$.
- 13. Define bounded sequence.
- 14. Define convergent & divergent sequences.
- 15. Prove that $(n^2) \rightarrow \infty$
- 16. Prove that if $(a_n) \to 0$ and $a_n > 0$ for all $n \in N$, then $\binom{1}{a_n} \to \infty$.
- 17. Prove that if $(a_n) \rightarrow l$, $(b_n) \rightarrow l$ and $a_n \leq c_n \leq b_n$ for all n, then $(c_n) \rightarrow l$.

SECTION - C

ANSWER ANY THREE QUESTIONS (3 X 6 = 18)

- 18. State and prove Cauchy-Schwarz inequality.
- 19. State and prove Weierstrass' inequalities.
- 20. Prove that any convergent sequence is a bounded sequence.
- 21. Prove that a sequence cannot converge to two different limits.
- 22. Show that $\lim_{n \to \infty} n^{\frac{1}{n}} = 1$.

SECTION – D

ANSWER ANY ONE QUESTION (1 X 12 = 12)

23. State and prove Triangle inequalities.

24. Prove that

- (a) A monotonic increasing sequence which is bounded above converges to its l.u.b.
- (b) A monotonic increasing sequence which is not bounded above diverges to ∞ .

*****All the best*****

III-B. Sc MATHS

DEPART MENT OF MATHEMATICS VIVEKANANDA COLLEGE **TIRUVEDAKAM WEST** DATE: 10:01:2019

I-SESSIONAL EXAM VI SEMESTER MAX.MARKS: 50 **TIME: 2 HOURS**

OPERATIONS RESEARCH - 05EP62

Section A

Answer all the question	IS:			10×1=10			
1. Inventory in general a	re build up to						
a) Satisfy demand dur	ring period of replenishme	ent b) Carry re	eserve stocks	to avoid shortages			
c) Keep pace with cha	anging market conditions		d) All the above.				
2. Economic Order Quar	ntity (EOQ) results in						
a) Equalization of car	rying cost and procurement	nt cost b	b) Minimization of set up cost				
c) Favorable procuren	nent price	d) 1	reduced chance	ces of stock outs			
3. If small orders are place	d frequently (rather than place	cing large orders infrequent	tly), then total i	inventory cost is			
a) Reduced	b) increased	c) either reduced or in	creased	d) minimized			
4. Which costs can vary	with order quantity?						
a) Unit cost only	b) holding cost only	c) Re-order cost only	d) al	l the above			
5. If the unit cost rises, w	vill optimum order quantit	У					
a) Increases	b) decreases	c) either increases or c	lecreases	d) no change			
6. If the total investment in stock is limited, will the best order quantity for each item be							
a) Greater than EOQ	b) equal to EOQ	c) less than EOQ	d) greater that	in or equal to EOQ			
7. If EOQ is calculated, but an order is than placed which is smaller than this, will the total inventory cost							
a) Increases	b) decreases	c) either increases or	decreases	d) no change			
8. The set-up cost is also	8. The set-up cost is also called						
a) Order cost	b) unit cost	c) holding cost	d) inver	ntory carrying cost			
9. The carrying cost is al	so called						
a) Order cost	b) unit cost	c) holding cost	d) invent	ory carrying cost			
10. The Shortage cost is also called							
a) Order cost	b) stock out cost	c) unit cost	d) ho	olding cost.			

SECTION – B

Answer Any five of the following questions:

11. Define set-up cost

12. A shipbuilding firm uses rivets at a constant rate of 20,000 numbers per year. Ordering costs are Rs. 30 per year. The rivets Rs.1.50 per number. The holding cost of rivets is estimated to be 12.5% of unit cost per year. Determine EOQ.

- 13. Define carrying cost
- 14. Define production cost

15. An item is produced at rate of 50 items per day. The demand occurs at the rate of 25 items per day.If the set-up cost is Rs. 100 and holding cost is Re. 0.01 per unit of item per day. Find EOQ

16. Define order cycle

17. An oil engine manufacturer purchases lubricants at the rate of Rs.42 per piece from a vendor. The requirement of these lubricants is 1,800 per year. What should be the order quantity per order, if the cost per placement of an order is Rs.16 and the inventory carrying charge per rupee per year is only 20 paise.

SECTION - C

Answer Any three of the following questions:

18. A company operating 50 weeks in a year is concerned about its stocks of copper cable. This costs Rs. 240 a metre and there is a demand for 8,000 metres a week. Each replenishment costs Rs.1050 for administration and Rs.1650 for delivery, while holding costs are estimated at 25 % of value held a year. Assuming no shortages are allowed, what is optimum inventory policy for the company? How would this analysis differ if the company wanted to maximize profit rather than minimize cost?

$3 \times 6 = 18$

5×2=10

19. A manufacturer has to supply his customer with 24,000 unitsofhis product per year. This demand is fixed and known. Since the unit is used by the customer in an assembly line operation and the customer has no storage space for the units, the manufacturer must ship a day's supply each day. If the manufacturer fails to supply the required units, he will lose the amount and probably his business. Hence the cost of shortage is assumed to be infinite and consequently, none will be tolerated. The inventory holding cost amounts to 0.01 per unit per month and the set-up cost preproduction run Rs. 350. Find optimum lot size and the length of the optimum production run.

20. A factory follows an economic order quantity system manufacturing stocks of one of its component requirements. The annual demand is for 24,000 units, the cost of placing an order is Rs.300 and the component cost is Rs.60 per unit. The factory has imputed 24 % as the inventory carrying rate.

(i) Find the optimal interval for placing orders, assuming a year is equivalent to 360 days.

(ii) If it is decided to place only one order per month, how much extra cost does the factory incur per year as a consequence of this decision

21. The details of a part to be machined are as follows:

Annual requirement = 2,400 pieces, Machine rate = 10 pieces/shift, Number of working days in the year = 320 shifts, Cost of machining a component = Rs. 100 per piece, Inventory carrying cost per annum = 12 % of value and Set-up cost per production run = Rs. 400. Find EOQ, optimal number of orders(n^0) and the production run(t^0).

22. A manufacturing company uses an EOQ approach in planning its production of gears. The following information are available. Each gear costs Rs. 250 per unit, annual demand is 60,000 gears, set-up cost are Rs.4,000 per set-up and the inventory carrying cost per month is established at 2 % of the average inventory value. When in production, these gears can be produced at the rate of 400 units per day and the company works only for 300 days in a year. Determine the economic lot size, the number of production runs per year and the total inventory costs.

<u>SECTION – D</u>

Answer Any one of the following questions:

23. a) A manufacturing company needs 2,500 units of a particular component every year. The company buys it at the rate of Rs.30 per unit. The order processing cost for this part is estimated at Rs.15 and the cost of carrying a part in stock comes to about Rs. 4 per year. The company can manufacture this part internally. In that case, it saves 20 % of the price of the product. However, it estimates a set-up cost of Rs. 250 per production run. The annual production rate would be 4,800 units. However, the inventory carrying costs remain unchanged. i) Determine the EOQ and the optimal number of orders placed in a year. ii) Determine the optimum production lot size and the average duration of the production run iii) should the company manufacture the component internally or continue to purchase it from the supplier? (10 marks) b) An item is produced at the rate of 50 items per day. The demand occurs at the rate of 25 items per day. If the set-up cost is Rs. 100 and the holding cost is Rs.0.01 per unit of item per day. Find EOQ. (2marks) 24. a) A manufacturing company purchases 9,000 parts of a machine for its annual requirements, ordering one month usage at a time. Each part costs Rs. 20. The ordering cost per order is Rs.15 and the carrying charges are 15 % of the average inventory per year. You have been assigned to suggest a more economical purchasing policy for the company. What advice would you offer and how much would it save the company per year?

b) A company plans to consume 760 pieces of a particular component. Past records indicate that purchasing department had used Rs. 12,000 for placing 15,000 orders. The average inventory was valued at Rs.45,000 and the total storage cost was Rs. 7,650 which included wages, rent, taxes, insurance, etc., related to store department. The company borrows capital at the rate of 10 % a year.

If the price of a component is Rs. 12 and the order size is of 10 components, determine: purchase cost, purchase expenses, storage expenses, capital cost and total cost per year.

1×12=12

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

		DEPAKI	MENI U	r MAIHEN	IAIICS			
CLASS TITLE		: II - MATHS : COMPETITIVE MATHEMATICS			S CS S	UBJECT UB. CODE	: SBS : 05SB41	
MONTH	& YEAR	: JAN 2019			D	ATE	: 04/01/19	
TIME		: 1 HOUR			Μ	MAX. MARKS: 25		
		I SES	SIONAL I	EXAMINAT	TION			
			SECT	ION-A				
		ANSWER AL	L THE Q	UESTIONS	$(5 \times 1 =$	5)		
1. W	hich of the f	following has 1	nost numb	er of divisor	s?			
(a)) 99	(b)	101	(c)	176	(d)	182	
2. $\frac{10}{11}$	$\frac{195}{68}$ when exp	pressed in sim	plest form	is :				
 (a)	13	(b)	15	(\mathbf{c})	17	(d)	25	
(u) 0 E'	16	(0)	16	(0)	26	(u)	26	
3. F1	nd the highe	est common fac	ctor of 36 a	ind 84?	10		10	
(a)) 4	(b)	6	(c)	12	(d)	18	
4. Th	4. The value of $337.62 + 8.591 + 34.4$ is :							
(a)) 370.61	1 (b)	380.511	(c)	380.611	(d)	426.97	
5. If	1.125 X 10 ^k	t = 0.001125, t	hen the val	ue of k is :				
(a)) -4	(b)	-3	(c)	-2	(d)	-1	

SECTION – B

ANSWER ANY TWO QUESTIONS $(2 \times 2 = 4)$

- 6. Find the H.C.F of 108, 288 and 360?
- 7. Reduce $\frac{391}{667}$ to lowest terms?
- 8. Evaluate: 31.004 17.2386?
- 9. If $\frac{1}{3.718} = 0.2689$, then find the value of $\frac{1}{0.0003718}$?

SECTION - C

ANSWER ANY ONE QUESTION $(1 \times 6 = 6)$

- 10. Find the L.C.M of 72, 108 and 2100?11. Simplify: $\frac{0.05 X 0.05 X 0.05 + 0.04 X 0.04 X 0.04}{0.05 X 0.05 0.05 X 0.04 + 0.04 X 0.04}?$

SECTION -D

ANSWER ANY ONE QUESTION (1 X 10 = 10)

12. Find the least number which when divided by 6,7,8,9 and 12 leaves the same reminder 1 in each case?

13. Arrange the fractions $\frac{5}{8}$, $\frac{7}{12}$, $\frac{13}{16}$, $\frac{16}{29}$ and $\frac{3}{4}$ in ascending order of magnitude?

*****All the Best****

BOOLEAN ALGEBRA – 05SB61

Section A

Answer all the questions:

5×1=5

- 1. If the relation ρ defined on **Z** by $a\rho b \Leftrightarrow ab$ is odd, then ρ said to be
 - a) reflexive and symmetric b) reflexive but not symmetric
 - c) symmetric but not reflexive d) neither symmetric nor reflexive
- 2. If the relation ρ defined on **Z** by $a\rho b \Leftrightarrow ab \ is \ odd$, then ρ said to be a) reflexive b) symmetric c) transitive d) equivalence relation
- 3. Let *S* be the set of all lines in the Euclidean plane $\mathbf{R} \times \mathbf{R}$. Define $a\rho b \Leftrightarrow a$ is parallel to *b*. Then ρ is _____
 - a) not reflexive b) not symmetric c) not transitive d)an equivalence relation
- 4. Let *S* be the set of all lines in the Euclidean plane $\mathbf{R} \times \mathbf{R}$. Define $a\rho b \Leftrightarrow a$ is perpendicular to *b*. Then ρ is _____
- a) reflexive b) symmetric c) transitive d) an equivalence relation 5. In **Z**, define $a\rho b \Leftrightarrow ab > 0$ then ρ is
 - a) not reflexive b) not symmetric c) not transitive d)an equivalence relation

<u>SECTION – B</u>

Answer Any five of the following questions:

- 6. Define reflexive relation and give an example.
- 7. Define symmetric relation and give an example.
- 8. Define transitive relation and give an example.
- 9. Define anti-symmetric and give an example.

SECTION – C

Answer any three of the following questions

- 10. Let $S = \{10,9,8,6,5\}$ with the relation usual \leq . Prove that (S, \leq) is poset and obtain the diagram.
- 11. Define an equivalence relation and give an example.

SECTION-D

Answer any one of the following questions

- 12. Let ρ be an equivalence relation defined on a set S. Then
 - i) $a\rho b \Leftrightarrow [a] = [b].$
 - ii) Any two distinct equivalence classes are disjoint
 - iii) S is the union of all the equivalence classes.
- 13. a) Define chain and give an example
 - b) Obtain the diagram of the set of all subgroups of S_3 .

ALL THE BEST

1×10=10

 $2 \times 2 = 4$

1×6=6