Sample Question Paper
Class: XI
Applied Mathematics
Session : 2022-23

Time Allowed: 3 hr **Maximum Marks: 80**

General Instructions:

1. This question paper contains five sections A, B, C, D and E. Each section is compulsory.
2. Section - A carries 20 marks weightage, Section - B carries 10 marks weightage, Section - C carries 18 marks weightage, Section - D carries 20 marks weightage and Section - E carries 3 case-based with totalweightage of 12 marks.
   Section – A:
3. It comprises of **20 MCQs of 1 mark** each.
   Section – B:
4. It comprises of **5 VSA type questions of 2 marks** each.
   Section – C:
5. It comprises of **6 SA type of questions of 3 marks** each.
   Section – D:
6. It comprises of **4 LA type of questions of 5 marks** each.
   Section – E:
7. It has **3 case studies**. Each case study comprises of 3 case-based questions, where **2 VSA type questions are of 1 mark** each and **1 SA type question is of 2 marks**. Internal choice is provided in **2 marks** questionin each case-study.

Internal choice is provided in **2 questions in Section - B**, **2 questions in Section – C, 2 questions in Section - D**. You have to attempt only one of the alternatives in all such questions.

	SECTION – A (All questions are compulsory. No internal choice is provided in this section)	Marks
1.	The equation of parabola with vertex at origin and directrix y = -3 is (a) $y^2 = 12x$ (b) $y^2 = -12x$ (c) $x^2 = 12y$ (d) $x^2 = -12y$	1
2.	The centre of the circle $2x^2 + 2y^2 + 4x - 6y - 3 = 0$ is (a) (1,-3/2) (b) (-1, 3/2) (c) (2,-3) (d) (-2, 3)	1
3.	Which of the following is binary expansion of 24? (a) 1101111 (b) 11000 (c) 111110 (d) 11001	1
4.	The value of $[5.2] - [-3.4]$ is (where [ ] is greatest integer function) (a) 9 (b) 2 (c) 8 (d) 1	1
5.	A, B, C, D are playing a game of Ludo. A, C and B, D are partners (partners sit opposite to each other). C is to the left of D who is facing south. In which direction is A's face: (a) North (b) West (c) South (d) East	1

6.	If it was Friday on 4 May 1964, then what was the day on 6 July 1965? (a) Monday (b) Tuesday (c) Wednesday (d) Saturday	1
7.	The domain of the function $f(x) = \frac{x^2-x}{x^2+2x}$ is (a) **R**-{0,2} (b) **R**-{2} (c) **R**-{0,-2} (d) **R**	1
8.	The value of $\lim_{x\to 0} \frac{(1+x)^n-1}{x}$ is (a) n (b) 1 (c) –n (d) 0	1
9.	If y = $\frac{1+\frac{1}{x^2}}{1-\frac{1}{x^2}}$, x ≠0, then $\frac{dy}{dx}$ is equal to (a) $\frac{-4x}{x^2-1}$ (b) $\frac{1-x^2}{4x}$ (c) $\frac{-4x}{(x^2-1)^2}$ (d) $\frac{4x}{(x^2-1)^2}$	1
10.	Two dice are thrown together, the probability that neither they show equal digits nor the sum of their digits is 9 will be (a) 13/15 (b) 13/18 (c) 1/9 (d) 8/9	1
11.	The limit for quartile coefficient of skewness are (a) -1 and 1 (b) -2 and 2 (c) -3 and 3 (d) 0 and 1	1
12.	The odd one out is (a) Sphere (b) circle (c) cylinder (d) cone	1
13.	In a code language TAPE is written as 4825, SMART is written as 91834 and BONE is written as 7605, then BASERA is written as (a) 789198 (b) 785198 (c) 789538 (d) 789138	1
14.	Statement I: All pens are pencils Statement II: Some books are pens. Conclusion I: Some pencils are book Conclusion II: Some pencils are pens. Which of the following is correct (a) Only conclusion I follow. (b) Only conclusion II follows. (c) Both conclusions I and II follows. (d) Neither conclusion I nor conclusion II follows	
15.	P and Q are sisters and R and S are brothers. P's daughter is R's sister. What is Q's relation with S? A) Grandmother B) Mother C) Aunt D) Sister	

16.	An annuity certain, in which the payment falls due at the beginning of each period is (a) Annuity immediate (b) annuity due (c) deferred annuity (d) contingent annuity	1
17.	The effective annual rate of interest corresponding to a nominal rate of 8% per annual payable half yearly is (a) 8.08% (b) 8.10% (c) 8.16% (d) 8.20%	1
18.	In what time will a sum of ₹ 1562.50 produce ₹ 195.10 at 4% per annual compound interest? (a) $1\frac{1}{2}$ years (b) 2 years (c) $2\frac{1}{2}$ years (d) 3 years	1
	For questions 19 and 20, two statements are given – one labeled Assertion(A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below: **(i) Both A and R are true and R is the correct explanation of the assertion** **(ii) Both A and R are true but R is not the correct explanation of the assertion** **(iii) A is true, but R is false** **(iv) A is false, but R is true**	
19.	Assertion (A) : If the numbers $-\frac{2}{3}$, k , $-\frac{3}{2}$ are in G.P. then k = ± 1 Reasoning (R) : If a, b, c are in G.P. then $b^2 = ac$ (a) (i) (b) (ii) (c) (iii) (d) (iv)	1
20.	Assertion (A) : $\lim_{x\to 1} \frac{ax^2+bx+c}{bx^2+cx+a} = 1$, where a + b + c ≠ 0 Reasoning (R) : $\lim_{x\to 3} \frac{\frac{1}{x}+\frac{1}{3}}{x+3} = \frac{1}{6}$ (a) (i) (b) (ii) (c) (iii) (d) (iv)	1
	SECTION – B (All questions are compulsory. In case of internal choice, attempt any one question only)	
21.	Find the value of x if $\frac{\log 169}{\log 13} = \log x$.	2
22.	A student can clear an examination if he/she secure more that 80% marks in atleast one of four subjects. In how many ways a student can clear the examination. OR There are 6 multiple choice questions in an examination, in which only 1 option is correct. How many sequences of answers are possible, if the first three questions have five choices and the next three have 4 choices?	2

23.	Find the value of k so that the function $f(x) = \begin{cases} \frac{x^2-2x-3}{x-3}, x \neq 3 \\ 2k, x = 3 \end{cases}$ is continuous at x = 3.	2
24.	Find the odd one out: 7, 8, 18, 57, 228, 1165, 6996. OR Looking at a portrait of a man, Aagam said, " His mother is the wife of my father' s son . Brothers and sisters I have none." At whose portrait was Aagam looking?	2
25.	A committee of 5 persons is to be constituted from a group of 6 males and 8 females. If the selection is made randomly, find the probability that there are 3 females and 2 males in the committee.	2
	SECTION – C (All questions are compulsory. In case of internal choice, attempt any one question only)	3
26.	Three numbers are in G.P. whose sum is 140. If the first and last numbers be multiplied by 4 and the middle number multiplied by 5, they will be in A.P. Find the numbers.	3
27.	On a certain sum of money, the difference between the compound interest for a year, payable half-yearly and the simple interest for a year is Rs180. Find the sum lent out, if the rate of interest in both the cases is 10%.	3
28.	Find the point(s) on x-axis whose distances from the line $\frac{x}{3} + \frac{y}{4} = 1$ is 4 units.	3
29.	Differentiate $\sqrt{2x+3}$ w.r.t. x by using first principle. **OR** If $f(x) = \left(\frac{x^4+1}{x^2}\right)^3$, find $f'(1)$.	3
30.	A manufacturing company planned to purchase a machine of Rs50000, which will increase the annual cash flow by Rs18000. The life of the machine is 3 years. After 3 years it will have no salvage value. The management of the company wants to a 18% return on investment. Compute the net present value of the investment. Should the machine be purchased according to NPV analysis? (Given that$(1.18)^{-3} = 0.6085$) **OR** A bank pays 8% interest per annum compounded half yearly. What equal amount should be deposited at end of each half year for $1\frac{1}{2}$ years to get an amount of Rs2000 at end of 18 months? (Given that $(1.04)^3 = 1.12$)	3

31.	Compute 70th percentile from the following data: Marks Group: 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 No. of Students: 5 | 7 | 10 | 16 | 11 | 7 | 5 | 4 | 3 | 2	3
	SECTION – D (All questions are compulsory. In case of internal choice, attempt any one question only)	
32.	In a test, an examinee either guesses or copies or knows the answer to a multiple choice question with four choices. The probability that he makes a guess is 1/3 and the probability that he copies the answer is 1/6. The probability that his answer is correct, given that he copied it, is 1/8. Find the probability that he knew the answer to the question, given that he correctly answered it. **OR** There are two bags, one of which contains 3 black and 4 white balls, while the other bag contains 4 black and 3 white balls. A fair die is cast, if the face 1 or 3 turns up, a ball is taken from first bag, and if any other face turns up a ball is chosen from the second bag. Find the probability of choosing a black ball.	5
33.	Let R be a relation on N defined by R = $\{(a,b) : a, b \text{ are coprimes}, a > b, b \neq 1, 1 < a < 7\}$, a) Write R in roster form b) Find the domain c) Find the range d) Find the codomain	5
34.	Find the Karl Pearson's coefficient of correlation between X and Y for the data: X: 6 | 2 | 4 | 9 | 1 | 3 | 5 | 8 Y: 13 | 8 | 12 | 15 | 9 | 10 | 11 | 16	5
35.	Mr. L.K.Das monthly basic salary is Rs193800. He receives HRA at the rate of 24% of basic salary and fixed transport allowance of Rs 8424 per month. His monthly contribution towards GPF is Rs40000. If he pays Rs45000 per month as income tax for first 11 months, how much income tax will he pay at the end of the financial year 2020-21? Annual Taxable Income | Tax Rates | Health and Education Cess Upto ₹2,50,000 | Nil | Nil	5

₹2,50,000 to ₹5,00,000	5% of total income exceeding ₹2,50,000	4% of the amounts of income tax
₹5,00,000 to ₹7,50,000	₹12,500 + 10% of total income exceeding ₹5,00,000	4% of the amounts of income tax
₹7,50,000 to ₹10,00,000	₹37,500 + 15% of total income exceeding ₹7,50,000	4% of the amounts of income tax
₹10,00,000 to ₹12,50,000	₹75,000 + 20% of total income exceeding ₹10,00,000	4% of the amounts of income tax
₹12,50,000 to 15,00,000	₹1,25,000 + 25% of total income exceeding ₹12,50,000	4% of the amounts of income tax
Above 15,00,000	₹1,87,500 + 30% of total income exceeding ₹15,00,000	4% of the amounts of income tax

Surcharge Rates

Taxable Income	Surcharge
Upto ₹50,00,000	Nil
₹5,00,001 to 10,00,000	10% of the amount of income tax
₹10,00,000 to ₹ 20,00,000	15% of the amount of income tax
₹20,00,000 to ₹50,00,000	25% of the amount of income tax
Above ₹50,00,000	37% of the amount of income tax

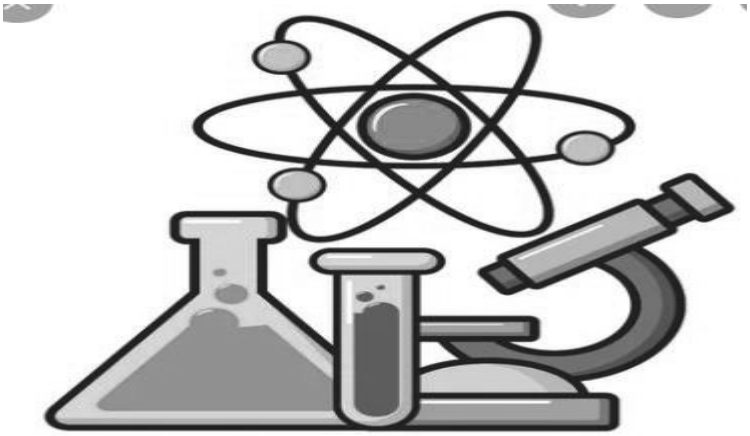
SECTION – E

(All questions are compulsory. In case of internal choice, attempt any one question only)

36. A retailer buys an air conditioner for Rs 40,000 from a whole-seller at a discount of 20% on the printed price and sells it to a consumer at the printed price. The sales are intra-state and the rate of G.S.T is 12%. 4 (1+1+2)

Based on above information, answer the following questions

	(i) The G.S.T paid by the retailer (ii) The G.S.T paid by the consumer (iii) The price including G.S.T, at which air conditioner was bought by the retailer OR The price at which the consumer bought the air conditioner	
37.	Krishnanagar is a small town in Nadia District of West Bengal. Krishnanagar clay dolls are unique in their realism and quality of their finish. They are created by modelling coils of clay over a metal frame. The figures are painted in natural colours and their hair is made either by sheep's wool or jute. Artisans make models starting from fruits, animals, God, goddess, farmer, fisherman, weavers to Donald Duck and present comic characters. These creations are displayed in different national and international museums. Here are a few images (not to scale) of some clay dolls of Krishnanagar.  **Doll A** **Doll B** **Doll C** **Doll D** The ratio of diameters of red spherical apples in Doll A to that of spherical oranges in Doll B is 2:3. In Doll C, male doll of blue colour has cylindrical body and a spherical head. The spherical head touches the cylindrical body. The radius of both the spherical head and the cylindrical body is 3cm and the height of the cylindrical body is 7cm. Based on the above information answer the following questions: i) What is the ratio of the volume of red spherical apple in Doll A to that of spherical orange in Doll B? ii) Find the surface area of blue coloured surface used in male Doll C. iii) The blue doll of Doll-C is reshaped and into the cylindrical drum of Doll-D. If the radius of the drum is also 3cm, find the height of the drum. OR If the clay used to make female Doll C is 1.5 times the clay used for blue male Doll C. Find the weight of clay used to make female Doll C. (1 cm^3 = 1.05gm)	4 (1+1+2)
38.	In a class of 24 students, 16 had taken Biology, 13 had Physics and 12 had Chemistry. 6 had	

	Biology and Chemistry, 10 had Biology and Physics and 5 had Physics and Chemistry. 4 of them had all three subjects. The school needed to find out more about the various grouping of the students in order to organize classrooms with the appropriate amount of lab kits for each subjects.  Based on the above information answer the following questions: (i) How many students had only Chemistry? (ii) How many students had only one subject? (iii) How many students had Biology or Physics but not Chemistry? OR How many students had at least two subjects?	4 (1+1+2)

Marking Scheme
Class: XI
Applied Mathematics
Session: 2022-23

Q. No	Value points/key points	Value point	Total marks
1.	(c) $x^2 = 12y$	1	1
2.	(b) $(-1, 3/2)$	1	1
3**.**	(b) 11000	1	1
4.	(a) 9	1	1
5.	(d) East	1	1
6.	(d) Saturday	1	1
7.	(c) **R**-{0,-2}	1	1
8.	(a) n	1	1
9.	(c) $\frac{-4x}{(x^2-1)^2}$	1	1
10.	(b) 13/18	1	1
11.	(a) -1 and 1	1	1
12.	(b) circle	1	1
13.	(c) 789538	1	1
14.	(c) Both conclusions I and II follows	1	1
15.	C) Aunt	1	1
16.	(b) annuity due	1	1
17.	(c) 8.16%	1	1
18.	(d) 3 years	1	1
19.	(a) (i)	1	1
20.	(c) (iii)	1	1
21.	$\frac{\log 169}{\log 13} = \frac{\log 13^2}{\log 13}$ $\frac{2\log 13}{\log 13} = 2$ So $\log x = 2$ x = 100.	½ ½ ½ ½	2
22.	Number of ways $C_1^4 + C_2^4 + C_3^4 + C_4^4$ $= 4 + 6 + 6 + 1 = 17$ OR Number of choices $= 5 \times 5 \times 5 \times 4 \times 4 \times 4$ $= 8000$	1 1 1 1	2
23.	$\lim_{x\to 3} \frac{(x-3)(x+1)}{x-3} = 4$ $2k = 4$ $k = 2$	1 ½ ½	2

24.	The odd one out 228 because $a_n = (n-1)a_{n-1} + (n-1)$. **OR** Since Aagam has no brother or sister, his father has only son. So wife of Aagam's father'son is Aagam' wife. Thus Aagam' wife is the man's mother. Consequently, man is Aagam's son.	1 1 1 1	2
25.	5 persons out of total 14 can be selected by C_5^{14}, and 3 females and 2 males can be chosen out of 8 females and 6 males = $C_3^8 \times C_2^6$ So required probability $= \frac{C_3^8 \times C_2^6}{C_5^{14}}$ $= \frac{60}{143}$	½ ½ 1	2
26.	Let 3 numbers in G.P. are a, ar, ar^2 then $a + ar + ar^2 = 140$ Also $4a, 5ar, 4ar^2$ will be in A.P. then $5ar - 4a = 4ar^2 - 5ar$ $4r^2 - 10r + 4 = 0$ $(r-2)(4r-2) = 0,$ $r = 2 \text{ or } \frac{1}{2}$ Hence when r = 2 a = 20 so three numbers are 20, 40,80 When r = $\frac{1}{2}$ then a = 80 so three numbers are 80, 40, 20	 1 1 ½ ½	3
27.	Let P = ₹ x S.I. for one year at 10% p.a. = $\frac{x \times 10 \times 1}{100} = \frac{x}{10}$ R.O.I. for conversion period (Half-yearly) = $\frac{1}{2} of\ 10\% = 5\%$ No. of periods (time) = 2 $C.I. = x\left[\left(1 + \frac{5}{100}\right)^2 - 1\right]$ $= x\left(\frac{21}{20} \times \frac{21}{20} - 1\right) = \frac{41}{400}x$ $C.I. - S.I. = \frac{41x}{400} - \frac{x}{10} = 180$ $x = 72000$ So the Sum lent out is ₹72000.	½ ½ 1 1	3
28.	$d = \left\lvert \frac{Ax_1 + By_1 + C}{\sqrt{A^2 + B^2}} \right\rvert$	½	

	$d = \left\lvert \frac{\frac{1}{3}(x) + \frac{1}{3}(0) - 1}{\sqrt{\left(\frac{1}{3}\right)^2 + \left(\frac{1}{4}\right)^2}} \right\rvert$ $\frac{x}{3} - 1 = \pm\frac{5}{3}$ then $x = 8 \; or \; -2$ Hence points on x-axis are $(8,0), (-2,0)$	1 1` ½	3
29.	$f(x) = \sqrt{2x+3}$ By definition $f'(x) = \lim_{h\to 0} \frac{\sqrt{2(x+h)+3} - \sqrt{2x+3}}{h}$ $= \lim_{h\to 0} \frac{\sqrt{2(x+h)+3} - \sqrt{2x+3}}{h} \times \frac{\sqrt{2(x+h)+3} + \sqrt{2x+3}}{\sqrt{2(x+h)+3} + \sqrt{2x+3}}$ $= \lim_{h\to 0} \frac{1}{h} \times \frac{2x+3+2h-2x-3}{\sqrt{2(x+h)+3} + \sqrt{2x+3}}$ $= \lim_{h\to 0} \frac{1}{h} \times \frac{2h}{\sqrt{2(x+h)+3} + \sqrt{2x+3}}$ $\frac{2}{2\sqrt{2x+3}} \; or \; \frac{1}{\sqrt{2x+3}}$ **OR** $f(x) = \left(\frac{x^4+1}{x^2}\right)^3$ Differentiating w.r.t. x $f'(x) = 3\left(\frac{x^4+1}{x^2}\right)^2 \left(2x - \frac{2}{x^3}\right)$, $f'(1) = 0$	1 1 1 2 1	3
30.	Given that Cash out flow ₹50000 And Cash flow = ₹18000, n = 3 and $i = \frac{18}{100} = 0.18$ Then the present value of cash flow = $18000\left[\frac{1-(1+0.18)^{-3}}{0.18}\right]$ So present value of cash flow = $100000[1-(1.18)^{-3}]$ = 100000[1 – 0.6085] = 39150 Then the net value ₹ 39150 – 50000 = - ₹ 10850. **OR** Given A = ₹2000, $i = \frac{8}{2\times 100} = 0.04 \; and \; n = 3$ ($1.5 \; years = 3 \; half \; years$) $A = R\left[\frac{(1+i)^n - 1}{i}\right]$ $2000 = R\left[\frac{(1+0.04)^3 - 1}{0.04}\right]$ $R = \frac{80}{0.125} = 640$ Hence ₹640 should be deposited at the end of each	½ 1 1 ½ ½ ½ 1 1	3

31.

Marks Group	No. of Students (f)	Cumulative frequency (c.f.)
0 – 10	5	5
10 – 20	7	12
20 – 30	10	22
30 – 40	16	38
40 – 50	11	49
50 – 60	7	56
60 – 70	5	61
70 – 80	4	65
80 – 90	3	68
90 – 100	2	70
		N = $\Sigma f_i = 70$

1

Computation of P_{70} : ½

$$N = 70 \Rightarrow \frac{70N}{100} = \frac{70 \times 70}{100} = 49.$$

The cumulative frequency just greater than 49 is 56. So, the corresponding class i.e. 50 – 60 is the 70th percentile class such that $l = 50,\ f = 7, h = 10, F = 49.$ ½

$$\therefore\ P_{70} = l + \frac{\frac{70N}{100} - F}{f} \times h = 50 + \frac{49 - 49}{7} \times 10 = 50.$$

Hence, $P_{70} = 50\ marks$ 1

3

32. Let E_1: Examinee guesses the answer, ½

E_2: Examinee copies the answer

E_3 : Examinee know the answer

A = Examinee answer correctly

P(E1) = 1/3, P(E2) = 1/6 and P(E3) = 1 – 1/3 – 1/6 so P(E3) = ½ ½

Hence P($\frac{A}{E_1}$) $= \frac{1}{4}$, p$\left(\frac{A}{E_2}\right) = \frac{1}{8}$ *and* $P\left(\frac{A}{E_3}\right) = 1$ 1

By Baye,s Theorem

$$P(E_3/A) = \frac{P(E_3)\,P\left(A/E_3\right)}{P(E_1)P\left(A/E_1\right)+P(E_2)\,P\left(A/E_2\right)+P(E_3)P\left(A/E_3\right)}$$ 1

$$= \frac{\frac{1}{2}\times 1}{\frac{1}{3}\times\frac{1}{4}+\frac{1}{6}\times\frac{1}{8}+\frac{1}{2}\times 1}$$ 1

$$= \frac{24}{29}$$ 1

OR

Let $E_1 = The\ die\ show\ 1\ or\ 3,$ ½

$E_2 = The\ die\ show\ 2, 4,\ 6\ or\ 5$

and A = Ball drawn is black.

$P(E_1) = \frac{2}{6} = \frac{1}{3}$, $P(E_2) = \frac{4}{6} = \frac{2}{3}$ ½

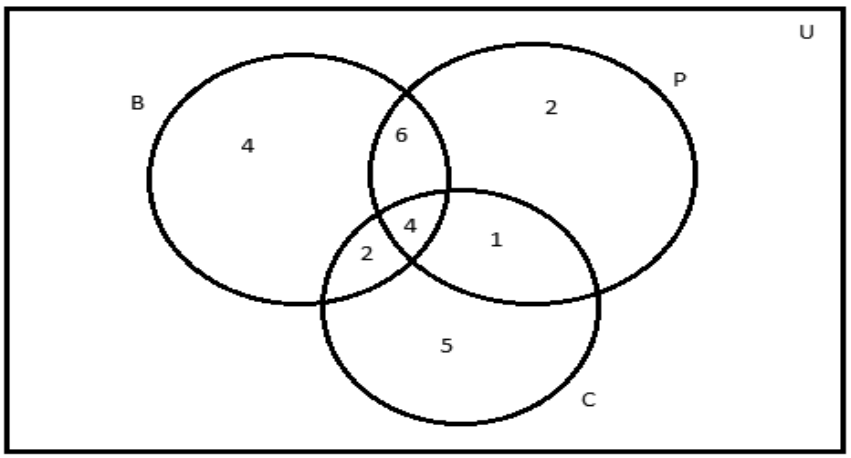
$\mathrm{P}\left(\mathrm{A}/\mathrm{E}_1\right) = \frac{3}{7}$, $P\left(A/E_2\right) = \frac{4}{7}$ 1

5

	Then by total Probability P(A) = $P(E_1)P\left(A/_{E_1}\right) + P(E_2)\,P\left(A/_{E_2}\right) + P(E_3)P\left(A/_{E_3}\right)$ P$(A) = \frac{1}{3}\times\frac{3}{7} + \frac{2}{3}\times\frac{4}{7}$ $= \frac{11}{21}$	1 1 1	
33.	a) $\{(3,2),(4,3),(5,2),(5,3),(5,4),(6,5)\}$ b) Domain: {3,4,5,6} c) Range: {2,3,4,5} d) N	2 1 1 1	5
34.	Let $u_i = x_i - 5$ *and* $v_i = y_i - 12$ $r(X,Y) = \frac{n\sum u_i v_i - (\sum u_i)(\sum v_i)}{\sqrt{n\sum {u_i}^2 - (\sum u_i)^2}\sqrt{n\sum {v_i}^2 - (\sum v_i)^2}}$ $= \frac{8(53)-(-2)(-2)}{\sqrt{8(56)-(-2)^2}\sqrt{8(56)-(-2)^2}}$=0.946	½ ½ for each column 1 1	5
35.	Monthly HRA= 24% *o* 193800 = 46512 Net monthly salary $(193800 + 46512 + 8424) = 248736$ Net taxable income = $12 \times 248736 = 2984830(\,Approximately)$ Income Tax = 187500 + 30% of (2984830 – 150000) = 187500 + 445449 = ₹632949 Health and Education cess = 4% of 632949 = ₹25317.96 or ₹25318 Surcharge 25% of 632949 = ₹158237.25 = ₹158237 Net income tax = 632949 + 25318 + 158237 = ₹816,504 only Income Tax already paid = ₹495,000 (11x45000) So at end Mr. Das has to pay 816,504 – 495,000 = ₹321,504.	1 ½ 1 ½ ½ ½	5

x_i	y_i	$u_i = x_i - 5$	$v_i = y_i - 12$	$u_i v_i$	$(u_i)^2$	$(v_i)^2$
6	13	1	1	1	1	1
2	8	-3	-4	12	9	16
4	12	-1	0	0	1	0
9	15	4	3	12	16	9
1	9	-4	-3	12	16	9
3	10	-2	-2	4	4	4
5	11	0	-1	0	0	1
8	16	3	4	12	9	16
		$\sum u_i = -2$	$\sum v_i = -2$	$\sum u_i v_i = 53$	$\sum {u_i}^2 = 56$	$\sum {v_i}^2 = 56$

		1	
36.	(i) G.S.T paid by the Retailer to the Government =4800-3840 = ₹960 (ii) G.S.T paid by the consumer=₹4800 (iii) Net Price=Printed Price- Discount=40000-8000=₹32000 SGST paid by the retailer to the whole seller =$\frac{6X32000}{100} = 1920$ CGST paid by the retailer to the whole seller=$\frac{6X32000}{100} = 1920$ So Total GST paid by the retailer = 1920+1920 = ₹3840 Price at which Air conditioner was bought by the retailer=32000+3840=₹35840 OR C.P for consumer=₹40000 SGST paid by the consumer to retailer=6% of ₹40000=₹2400 CGST paid by the consumer to retailer=6% of ₹40000=₹2400 Total G.S.T paid by the consumer to the Retailer=2400+2400=₹4800 Price at which consumer bought the Air conditioner =40000+4800=₹44800	1 1 1 1 ½ ½ 1	4
37.	(i) ratio of volumes = $r_1^3 : r_2^3 = 8 : 27$ (ii) surface area = 2π r h = 132 cm^2 (iii) Let the height of the drum be h. Volume of the drum = volume of the cylinder + volume of the sphere $\pi\ 3^2$ h = ($\pi\ 3^2 \times 7 + \frac{4}{3}\pi\ 3^3$) $\Rightarrow h = 7 + 4$ $\Rightarrow h = 11cm$ OR Volume of female doll = $\frac{3}{2}(\pi\ 3^2 7 + \pi\ 3^3$) Weight of clay = $\frac{3}{2}X\ \frac{22}{7}\ X\ 9\ X\ 10\ X\ 1.05$ = 445.5 gm	1 ½ ½ ½ ½ 1 ½ ½ 1	

38.	(i) 5 students (ii) 15 students (iii) 10 students OR 13 students.  		1 1 2	4