

Appendices

Appendix 1: Mathematical Questions Used for the Study

1. In the following data, in which series does the lower quartile lie? Write it.

Marks	200-300	300-400	400-500	500-600	600-700
cf	40	55	68	77	80

2. What is the relation between the area of triangles standing on the same base and between the same parallel lines? Write it.
3. Ms Bhandari wants to buy 2000 Bahrain Dinar paying Nepalese currency. Suppose buying and selling rates of 1 Bahrain Dinar is Rs. 271.73 and Rs. 273.33. How much Nepali currency is required for the transaction?
4. The price of a motorcycle is Rs. 2, 25, 000. If its price is depreciated per year by 8%, after how many years will the motorcycle price be Rs. 1, 75, 204.80? Find it.
5. Three metallic spheres of radii 1 cm, 6 cm and 8 cm are melted and re-formed into a single sphere. Find the radius of the new sphere.
6. The sum of the height and the radius of the base of a cylinder is 34 cm. If the total surface area of the cylinder is 2, 992 sq. cm, find the radius.
7. Find HCF of $x^4+x^2y^2+y^4$ and x^3+y^3
8. Simplify: $\sqrt{27} + \sqrt{75} - 8\sqrt{3}$
9. Simplify: $\frac{5 \times 2^k - 5 \times 2^{k-2}}{2^{k+2}}$
10. Find the LCM of a^3-64 , $2a^2-32$
11. If two are added to the half of the square of a number, the result is 20. Find the number.
12. In a continuous series, $N= 12+k$, $\sum fx = 168 + 14k$. Find the mean.
13. A card is drawn from a well-shuffled deck of 52 cards. What is the probability of getting a king or red card?
14. Eight black and five white pens of the same size are kept in a bag. Two pens are drawn one after the other without replacement. Show the probabilities of all possible outcomes in a tree diagram.
15. Out of the students who appeared in an examination, 80% passed in Nepali, 75% passed in science, 5 % failed in both subjects, and 300 passed both subjects then,
 i. Represent the above information in a Venn-Diagram.
 ii. Find the number of students who appeared in the examination.
 iii. Find the number of students who passed science only.
16. Simplify: $\frac{1}{y+b} + \frac{1}{y+c} + \frac{1}{y+d} + \frac{by}{y^3+by^2} + \frac{cy}{y^3+cy^2} + \frac{dy}{y^3+dy^2}$
17. Construct a quadrilateral ABCD in which $AB=BC= 5.5$ cm, $CD=DA= 4.5$ cm and $\angle A= 60^\circ$. Also, construct a triangle ADE equal in area to the quadrilateral ABCD.
18. Experimentally verify that the angle XOZ at the centre of a circle is double the angle XYZ at the circumference of a circle standing on the same arc X.Z. (Two circles with radii at least 3 cm are necessary)
19. The upper part of a straight tree broken by the wind makes an angle of 45° with the plane surface at a point 9 m from the foot of the tree. Find the height of the tree before it was broken.

20. The third quartile of the given data is 128; find the value of x.

Marks Obtained	0-30	30-60	60-90	90-120	120-150	150-180
f	2	8	22	24	x	9

Table 2 Evaluation Criteria

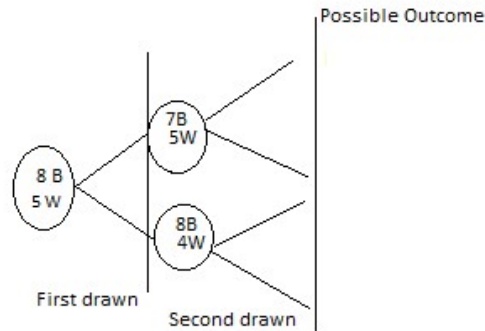
Q. N.	Descriptions	Marks Allocations
1	$\frac{N}{4} = \frac{80}{4} = 20 < 40$ So, the lower quartile class is 200-300	1
2	They are equal	1
3	(i) Selling rate of 1 Bahrain= Rs. 273. 33 (ii) Required Nepalese currency = 2000× 273.33 ∴ Required amount = Rs. 546, 660	1 1
4	(i) $175204.80 = 225000 \left(1 - \frac{8}{100}\right)^T$ (ii) $0.778688 = (0.92)^T$ $(0.92)^3 = (0.92)^T$, T= 3 years	1 1
5	(i) $\frac{4}{3}\pi(1)^3 + \frac{4}{3}\pi(6)^3 + \frac{4}{3}\pi(8)^3 = \frac{4}{3}\pi r^3$ (ii) $1+216+512 = r^3$ $r = \sqrt[3]{729} = 9\text{cm}$	1 1
6	(i) $r + h = 34 \text{ cm}$ (ii) $2\pi r(r + h) = 2992$ (iii) $2 \times \frac{22}{7} \times r \times 34 = 2992$ ∴ $r = 14 \text{ cm}$	1 1
7	(i) (x^2+xy+y^2) (x^2-xt+y^2) and $(x+y)$ (x^2-xy-y^2) (ii) HCF x^2-xy-y^2	1 1
8	(i) $3\sqrt{3} + 5\sqrt{3} - 8\sqrt{3}$ (ii) $(3+5-8)\sqrt{3} = 0\sqrt{3} = 0$	1 1
9	(i) $\frac{2^k(5-\frac{5}{4})}{2^k \times 2^2}$ (ii) $\frac{15}{16}$	1 1
10	(i) $(a-4)(a^2+4a+16)$ and $2(a+4)(a-4)$ (ii) LCM= $2(a+4)(a-4)(a^2+4a+16)$	1 1
11	(i) $\frac{x^2}{2} + 2 = 20$ (ii) $x = \pm 6$	1 1
12	(i) $\bar{X} = \frac{\sum fx}{N}$ $\bar{X} = \frac{168+14k}{12+k}$ (ii) $\bar{X} = \frac{14(12+k)}{12+k}$ ∴ $\bar{X} = 14$	1 1
13	(i) $n(s) = 52$, $n(K) = 4$, $n(R) = 26$, $n(K \cap R) = 2$ $P(K \cup R) = P(K) + P(R) - P(K \cap R)$	1

$$(ii) P(K \cup R) = \frac{4}{52} + \frac{26}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$$

∴ The probability of getting a king or red card is $\frac{7}{13}$

1

14



1

1

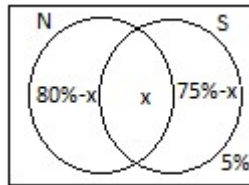
(i) $n(U) = 100\%$, $n(N) = 80\%$, $n(S) = 75\%$,

1

$n(\overline{N \cup S}) = 5\%$, $n(N \cap S) = 300$ with correct letting

(ii) Correct information in the Venn diagram

15



(iii) $n(N \cap S) = 60\%$

1

$60\% = 300$

1

$1\% = 5$

(iv) $n(U) = 500$, $n_0(S) = 15\%$ of $500 = 75$

1

(i) $\frac{1}{y+b} + \frac{1}{y+c} + \frac{1}{y+d} + \frac{by}{y^2(y+b)} + \frac{cy}{y^2(y+c)} + \frac{dy}{y^2(y+d)}$

1

(ii) $\frac{1}{y+b} + \frac{1}{y+c} + \frac{1}{y+d} + \frac{b}{y(y+b)} + \frac{c}{y(y+c)} + \frac{d}{y(y+d)}$

16

$= \frac{1}{y+b} + \frac{b}{y(y+b)} + \frac{1}{y+c} + \frac{c}{y(y+c)} + \frac{1}{y+d} + \frac{d}{y(y+d)}$

1

(iii) $\frac{y+b}{y(y+b)} + \frac{y+c}{y(y+c)} + \frac{y+d}{y(y+d)}$

1

(iv) $\frac{1}{y} + \frac{1}{y} + \frac{1}{y} = \frac{3}{y}$

1

(i) For rough sketch

1

(ii) For the construction of quadrilateral

1

17

(iii) Construction of triangle equal in area of quadrilateral with marking parallel lines

1

(iv) Conclusion

1

(i) For the correct figure

1

18

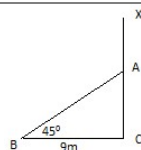
(ii) For the correct verification table

1+1

(iii) For the correct conclusion

1

19



(i) Correct figure and description

(ii) In rt. Angle ΔABC

$$\tan 45^\circ = \frac{AC}{9}$$

$$\text{Or, } AC = 9\text{m}$$

Also,

$$\cos 45^\circ = \frac{9}{AB}$$

(iii) Or, $AB = 9\sqrt{2}$ m

(iv) $CX = AB + AC$ and conclusion

1

1

1

1

(i) Correct cf table

1

Marks Obtained	f	cf
0-30	2	2
30-60	8	10
60-90	22	32
90-120	24	56
120-150	x	56+x
150-180	9	65+x

20

$$N = 65 + x$$

(ii) $Q_3 = 128$, Q_3 class is 120-150

$$(iii) 128 = 120 + \frac{\frac{3(65+x)}{4} - 56}{x} \times 30$$

(v) $x = 15$

1

1

1
