

SECTION A — Multiple Choice, Questions 1–20 (each 1 mark)									
1. B	2. A	3. C	4. D	5. C	6. A	7. D	8. D	9. B	10. C
11. A	12. D	13. A	14. B	15. D	16. B	17. C	18. A	19. C	20. C

Q19 (angle ABC) is determined by protractor measurement — keyed value 95°; accept the candidate’s correctly measured value within tolerance.

SECTION B — Questions 21–40 (working + answers)	
21. (a) $10000 - 6784 = \mathbf{3216\text{ m}}$. (b) Six thousand, seven hundred and eighty-four metres. (c) Nearest hundred = 6800 m. <i>(1+1+1)</i> 22. (a) $V = 2.4^3 = \mathbf{13.824\text{ m}^3}$. (b) $50\text{ cm} = 0.5\text{ m}$; No. = $13.824 / 0.5^3 = 13.824 / 0.125 = \mathbf{110.592} \approx \mathbf{110\text{ cubes}}$. <i>(2+2)</i> 23. Ratio 5:7:3; children = 60 → 1 part = 20. (a) Men = $5 \times 20 = \mathbf{100}$. (b) Women = $7 \times 20 = 140$; $140 - 100 = \mathbf{40\text{ more women}}$. <i>(3+2)</i> 24. Work = $5 \times 6 \times 12 = 360$ man-hours. New rate = $3 \times 8 = 24$ mh/day; days = $360 / 24 = 15$. Extra = $15 - 12 = \mathbf{3\text{ more days}}$. <i>(4)</i> 25. Let $x = 0.1777\dots$; $10x = 1.777\dots$, $100x = 17.777\dots$; $90x = 16 \rightarrow x = 16/90 = \mathbf{8/45}$. <i>(4)</i> 26. $4b + 3p = 315$; $8b + 2p = 530 \rightarrow 4b + p = 265$. Subtract: $2p = 50 \rightarrow p = 25$; $4b = 240 \rightarrow b = 60$. Book = Ksh 60, Pen = Ksh 25. <i>(4)</i> 27. (a) $\text{Wk1} = (7\ 15\ 5 / 9\ 20\ 3)$, $\text{Wk2} = (6\ 10\ 4 / 14\ 15\ 8)$. (b) Total = (13 25 9 / 23 35 11) — A: 13 oranges, 25 mangoes, 9 bananas; B: 23 oranges, 35 mangoes, 11 bananas. <i>(1+1)</i> 28. (a) $y - 4 = (1/2)(x - 1) \rightarrow \mathbf{2y = x + 7}$ ($y = (1/2)x + 7/2$). (b) $y = 0 \rightarrow x = -7 \rightarrow \mathbf{(-7, 0)}$. <i>(2+2)</i> 29. $\text{TSA} = \pi r(r + l) = \pi(4.2)(4.2 + 20) = \pi \times 101.64 = \mathbf{319.31\text{ cm}^2}$ (2 dp). <i>(5)</i> 30. $V(\text{sphere}) = (4/3)\pi(1.5)^3 = 4.5\pi$. $\pi(1.8^2)h = 4.5\pi \rightarrow 3.24h = 4.5 \rightarrow h = \mathbf{1.4\text{ cm}}$ (1 dp). <i>(4)</i> 31. (a) $L = \sqrt{(3.6^2 + 4.8^2)} = \sqrt{36} = \mathbf{6\text{ m}}$. (b) Density = $2400\text{ g} / 600\text{ cm}^3 = \mathbf{4\text{ g/cm}^3}$. <i>(2+2)</i>	32. Longitude difference = $50 + 40 = 90^\circ$; time = $90 \times 4 = 360\text{ min} = 6\text{ h}$. P is west of Q (behind): 4.00 p.m. – 6 h = 10.00 a.m. <i>(4)</i> 33. (a) Import duty = $20\% \times 1,200,000 = \mathbf{\text{Ksh } 240,000}$. (b) Excise = $18\% \times (1,200,000 + 240,000) = 18\% \times 1,440,000 = \mathbf{\text{Ksh } 259,200}$. (c) VAT = $16\% \times (1,200,000 + 240,000 + 259,200) = 16\% \times 1,699,200 = \mathbf{\text{Ksh } 271,872}$. <i>(2+2+1)</i> 34. (a) Accurate parallelogram ABCD: AB = 6 cm, AD = 4 cm, $\angle\text{DAB} = 45^\circ$ (45° by bisecting 90°). (b) DE = perpendicular from D to AB; $\text{DE} = 4 \sin 45^\circ \approx \mathbf{2.8\text{ cm}}$ (accept 2.7–2.9 cm). <i>(3+2)</i> 35. (a) $y = 50x \rightarrow x = 0.5$ gives $y = \mathbf{25}$; $x = 2$ gives $y = \mathbf{100}$ (table: 0, 25, 50, 75, 100). (b) Straight line through (0,0), (1,50), (2,100). <i>(1+2)</i> 36. $\tan 35^\circ = h / 47 \rightarrow h = 47 \tan 35^\circ = 47 \times 0.7002 = \mathbf{32.9\text{ m}}$. <i>(2)</i> 37. (a) Scale 1 cm : 10 m; A → B 5 cm @ 120°, B → C 7 cm @ 210°. (b)(i) $\text{AC} \approx \mathbf{86\text{ m}}$ (accept 84–88 m). (ii) Bearing of C from A $\approx \mathbf{174^\circ}$ (accept $172\text{--}176^\circ$). <i>(3+1+1)</i> 38. (a) Net = 6 rectangles (two 5×3, two 5×2, two 3×2). (b) $\text{TSA} = 2(5 \times 3 + 5 \times 2 + 3 \times 2) = 2(15 + 10 + 6) = \mathbf{62\text{ cm}^2}$. <i>(2+3)</i> 39. (a) Frequency: $15 \rightarrow 2$, $17 \rightarrow 5$, $18 \rightarrow 3$, $19 \rightarrow 6$, $22 \rightarrow 2$, $29 \rightarrow 1$, $33 \rightarrow 1$. (b)(i) Mean = $389 / 20 = \mathbf{19.45}$. (ii) Median = $(18 + 19) / 2 = \mathbf{18.5}$. <i>(2+2+1)</i> 40. (a) Sample space = {H1,H2,H3,H4,H5,H6,T1,T2,T3,T4,T5,T6} = 12 outcomes. (b) $P(\text{Head and 4}) = 1/2 \times 1/6 = \mathbf{1/12}$. <i>(2+1)</i>

Q22(b): packing by volume gives $110.592 \rightarrow 110$ whole cubes. Q33: excise and VAT are computed on the cumulative (KRA) base; if a simple % of customs value is used instead — ID 240,000, Excise 216,000, VAT 192,000. Q34 & Q37 are construction/scale-drawing items — award method and accuracy within tolerance.

Get Free Learning Resources at www.competencebased.com